

Complexity Leadership: The First Two Decades

Matthew P. Earnhardt
Embry-Riddle Aeronautical University

Daryl V. Watkins
Embry-Riddle Aeronautical University

Steven M. Walker
National University

Complexity leadership, complex adaptive leadership, and adaptive leadership theories are related but separate streams of leadership research dating back four decades. This article reviews the first two decades. The research team searched academic literature within the business discipline for journal articles related to complex adaptive leadership, complexity leadership, and adaptive leadership, resulting in a sample of 778 articles. The researchers used multiple methods to analyze the articles, eventually conducting deductive analysis on a subset of nine articles published between 1982-2002.

Analysis from the sample revealed frustration by some leadership scholars over the ability of leadership theory to address practical leadership problems. Therefore, scholars called for and began to develop novel approaches beyond concepts of leader-follower influence. Scholars turned their attention to understanding the role of leadership within VUCA contexts. They began to conceive of organizations as open systems and to describe characteristics that leaders would need to be successful in complex adaptive systems. These early attempts set the stage for scholars to apply complexity theory to the study of leadership.

Keywords: complexity leadership, complex adaptive leadership, adaptive leadership theory

INTRODUCTION

Complex Adaptive Leadership is an emergent leadership theory that addresses some of the gaps with traditional leadership models. At the beginning of the 1980's, a new leadership paradigm emerged due to the increased complexity of the world and the rise of globalization, nationalism, technological advances and increased interconnectedness. Theorists were and are facing uncharted waters where the traditional leadership models based on closed, hierarchical, and controllable organizational structures no longer served us. As our economy and organizational systems continue to advance in the information age, our interaction with complexity and chaos becomes more commonplace. Leadership scholars have contended that newer theories of leadership based on the understanding of complexity science are needed to adapt to these new normals (Crain et al., 2020; Day & Harrison, 2007; Nelson & Squires, 2017; Uhl-Bien & Marion, 2009; Uhl-Bien, Marion, & McKelvey, 2007; Wilson, 2020). The leadership literature is understanding that the

ever-changing and complex world needs to shed the leadership theories based on leader and follower interactions and adapt a more holistic view of leadership focusing on various inputs from internal and external systems which drive organizational change. For leadership practitioners interested in assessing and developing Complex Adaptive Leadership in their organizations and groups, understanding the historical underpinnings of the theory and the emergent themes that have shaped the research over the past 40 years is essential.

Leadership is a dynamic phenomenon that has been evolving along with the changes seen in organizations, economies, and societies. Classical leadership theories were primarily considered with the leader and evolved through a relationship model as each theorist addressed gaps within the leadership paradigm. Theorists beginning in the 1980s found assumptions based on leadership that do not address external or internal stimuli do not offer a complete picture and understanding of the nuances of leadership. Leadership theories such as Complex Adaptive Leadership are based on the idea that leadership as a phenomenon is socially constructed and dependent on the entanglement of leader, follower, and the ever-changing situation. The world is complex, and to ignore the influence of the environment on the leader, follower, and organization does not fully address the reality of the world.

The authors argue that an adaptive leadership approach that understands complexity is going to become more important as we move further into the information age (Uhl-Bien & Marion, 2009; Uhl-Bien, Marion, & McKelvey, 2007). As our global environment and economies become more entangled and complex, we're going to need to understand the finer points available in the various theories of complexity leadership. These theories promote a style of leadership where the leader sees themselves as encourager, learner, communicator, enabler, empowerer and relationship builder, rather than a leader who's a controller and enforcer. This is particularly important in the seminal works that defined the complexity leadership field. Changes in both the global environments and global economies are forcing leadership scholars and practitioners alike to shift their paradigms on how one views, discusses and practices leadership in organizations (Campbell, 2013; Uhl-Bien, 2021; Uhl-Bien & Marion, 2009; Uhl-Bien, Marion, & McKelvey, 2007).

Study Significance

Over the past several decades, the leadership theory continues to shift to theorists presenting theories of complexity leadership from various lenses, but all within the realm of adaptability, systems thinking, organizational learning, context, networks, flexibility and other components. Though the theory has begun to coalesce around these components, no theorist has addressed the convergent and divergent themes around complexity leadership to date. Therefore, an examination of the seminal work of the theory is necessary to form a theoretical base from which an understanding of the theory can be derived. This will help set a theoretical basis for complexity research moving forward, will simplify the complex nature of the different research and will help provide the foundation for an understanding of the various time periods that define this relatively new theory.

LITERATURE REVIEW

Complexity Theory and Leadership

Complexity theory recognizes the importance of relationships between entangled variables and agents within systems that create unpredictable behavior (Backlander, 2019; Hazy, 2008). These relationships are not interdependent of each other, but work in a system. As indicated by (Uhl-Bien, Marion, & Meindl, 2007) "Complexity theory is the study of the dynamic behaviors of complexly interacting, interdependent, and adaptive agents under conditions of internal and external pressure" (p. 3). In other words, complexity theory and understanding complex systems recognizes the non-linear and unpredictable nature of leadership and seeks provide linkages to emergent structures (Marion & Uhl-Bien, 2001). An additional feature of complexity is that cause-and-effect relationships are harder to identify and can change rapidly (Osborn et al., 2002, pp. 822-823), which makes traditional leadership control less possible. Looking at leadership through this paradigm, the focus is less on the individual known as the leader and more on the relationships

between leader, followers, environment and the interplay among these interacting forces (Backlander, 2019; Hazy, 2008).

Complexity theory looks to foster the distributed intelligence that is a function of “strategically relevant human and social capital assets — the networked intellectual capabilities of human agents” (Marion & Uhl-Bien, 2001, p. 391). Add to this the open nature of both natural and societal systems, and the focus of leadership becomes more complicated. Therefore, theories that just describe leadership behaviors do little to explain the complexity of leadership as a science. As organizations and economic systems become increasingly open, leadership requires enlarging one’s perspective to see the entire complex and volatile interdependence of systems that comprise, interact, and influence individuals, organizations, and the globe (Parks, 2005). Understanding these complex relationships is important for leaders working in complex or chaotic environments or during times of chaos (Backlander, 2019). Parks (2005) indicated that in order to be a successful leader in this environment, a leader must hold steady in the face of uncertainty and enable people to work together. Backlander (2019) later added that leaders should act as teachers, coaches and enablers (p. 56).

Leaders within complex systems and during unstable times should focus more on teaching, coaching, enabling, and using less direct authority for empowerment (Backlander, 2019; Bergquist, 1993; Hazy, 2008). Therefore, leaders focus on rich connectedness and dynamic interactions (Tsai et al., 2019; Uhl-Bien, 2021; Uhl-Bien & Marion, 2009). Leaders who are self-aware of this organizational complexity should: (a) be tolerant of ambiguity and uncertainty, (b) be constantly learning, (c) have a strong sense of mission and purpose, (d) express systems as unity in their environment, and (e) translate feedback into structural changes in the influence network among agents (Bergquist, 1993; Hazy, 2008). Bergquist (1993) and Senge (1992) claimed that learning from mistakes and creating effective learning environments are of utmost importance for leaders in today’s organizations. Organizational learning is an important component of Complex Adaptive Leadership. Leaders who understand the nature of complex systems and networks and work from a framework that embraces complexity should be able to look past the immediate cause and effect relationships to identify real problems and “causes of the rogue events or jerky behavior” (Bergquist, 1993, p. 114). Furthermore, leaders should allow for the natural informal leadership process to encourage innovative responses (Tsai et al., 2019; Uhl-Bien & Marion, 2009).

Hannah et al. (2010) contended that leadership is contextual and argue for a more multilayered and systems perspective of leadership where the main focus is on leadership within dangerous and complex situations. Hannah et al. (2010) suggested that a multilevel approach where the first level (micro-level or individual-level) is focused on emotions, meaning-making, cognition and danger, individual differences and danger, physiological effects and danger, and motivation and danger. The next level is the dyad level, which focuses on how the leader and follower relationship may impact the leader process during danger. The next level is the meso-level, which looks at and takes into consideration the type of groups and teams involved, group processes, group complexity, social networks and group prototypes. At the final level macro-level one is taking into consideration the entire organization and system. These larger systems are open, unstable, and unpredictable. Therefore, the leader should not expect to control but rather should learn to influence and manipulate the systems of complexity.

Similarly, Uhl-Bien and Marion (2009) discussed leadership in complex systems where complex systems are defined as systems that exist within other larger systems. These complex systems are never static, but are rather in constant flux. Because of this, Complexity Leadership Theory is contextual in that it is highly dependent on what the context of the system is and what its connections to and state of relationships are with surrounding systems. This is important for leadership because it leads to adaptability which can aid in making higher level decisions.

Uhl-Bien, Marion and McKelvey (2007) contended that leadership should be characterized by a contextual outlook, a requirement that one separate the definitions of leader and leadership, a requirement that one understand and differentiate between a leader and manager (one is a position and bureaucratic, and the other is emergent and informal), and complexity leadership occurs within adaptive challenges, not technical problems (Heifetz et al., 2009b). An organization must match the level of complexity of its surrounding environment to survive.

Adaptive Leadership

Adaptive Leadership, developed by Heifetz et al. (2009b) is a theory that focuses on organizational change and growth in response to environmental influences. Heifetz et al. (2009b) indicated those who practice adaptive leadership seize opportunities during turmoil as chances to hit the organizational reset button, to adapt, change and grow. In order to take drastic and adaptive change, an adaptive leader is responsible for seeing the bigger picture in a more holistic fashion. They must look at the organization in such a way that allows for the change and adaptation to occur (Heifetz et al., 2009a). Heifetz et al. (2009b) refer to leadership in this way as an improvisational and experimental art. In this way, in order to adapt, leaders need to employ different leadership tactics above some of their traditional ways of leading through crisp decision making, analytical problem solving and clear directions. Instead Heifetz et al. (2009b) indicated that during an adaptation phase, leaders must: (a) foster adaptation, (b) embrace disequilibrium and (c) generate leadership.

To foster adaptation, Heifetz et al. (2009b) advocated for leaders to distinguish the essential from the expendable. Figure out what is important and discard that which is not important. Heifetz et al. (2009b) discussed adaptability as eschewing the strategic plans and instead running numerous experiments which are characterized by mid-course corrections. To do so, one is able to tackle the current challenge and build adaptability into the organization. In addition to adaptation, Heifetz et al. (2009b) stated that a leader must embrace disequilibrium by keeping a constant hand on the thermostat. If the heat is too low, individuals will not make difficult decisions, while if the heat is too high, individuals will panic. Adaptive leadership requires a deft hand in maintaining the proper balance of disequilibrium (Heifetz et al., 2009b). To maintain disequilibrium, depersonalizing conflict and creating a culture of courageous conversations is needed. Finally, Heifetz et al. (2009b) indicated that to generate leadership, one must distribute leadership responsibility with organizational bandwidth drawn on collective intelligence. In this way, everyone must be mobilized to generate solutions to complex problems and increase communication flow so that innovation is fostered and allowed to flourish.

According to Heifetz et al. (2009b), adaptive leadership is a process with three main components: observing, interpreting and intervening. Adaptive leadership is an iterative process involving three key activities: 1) observing events and patterns around you; 2) interpreting what you are observing (developing multiple hypotheses about what is really going on); and 3) designing interventions based on the observations and interpretations to address the adaptive challenge you have identified. Each of these activities builds on the ones that come before it and the process overall is iterative; you repeatedly refine your observations, interpretations, and interventions (Heifetz et al., 2009b, p. 32).

In considering those main factors, adaptive leadership advocates for and requires constant innovation and iteration to remake an organization into a highly functioning unit. In this way, Heifetz et al. (2009b) called to seize moments and allow for adaptation and change. Raney (2014) discussed that adaptive leadership addressed the difficulty an organization faces during a crisis. There are situations where tensions between different perspectives, difficult learning and loss are required and new competencies and loyalties are formed as the organization adapts to the new normal. In this way, adaptive leadership allows for the development of "...sustainable resources of flexibility and resilience, including nurturing crucial relationships with a wide variety of stakeholders whom the organization regards as an important source of education, support and mutual encouragement" (Raney, 2014, p. 317).

Complex Adaptive Leadership

Uhl-Bien, Marion and McKelvey (2007) indicated that most leadership models have been focused on top-down, bureaucratic models which no longer work, and a paradigm focused on adaptive outcomes (with an emphasis on context) is needed. According to Apenko and Chernobaeva (2016), traditional leadership is losing relevance and developing the competence of adaptive leadership is critical for effective success. Marion and Uhl-Bien (2001) discussed that Complex Adaptive Leadership moves away from a linear view of the world and understands the complex and dynamic nature of the environment. Hannah et al. (2010) commented that leadership is a dynamic system. Uhl-Bien, Marion and McKelvey (2007) distinguished Complex Adaptive Leadership theory as focused on the dynamic and complex systems that comprise

leadership. Leaders act within this system to influence the system and outcomes. Complex Adaptive Leadership occurs through solving adaptive challenges (requiring new learning, innovation, and patterns of behavior) and not through technical problems (Uhl-Bien, Marion, & McKelvey, 2007).

As stated by Marion and Uhl-Bien (2001) “leaders are part of a dynamic rather than being the dynamic itself” (p. 414). Weberg (2012) added that in a Complex Adaptive Leadership framework the assumption that the leader has the answer is false. A leader should network with the team to exchange information and knowledge to improve outcomes. Chadwick (2010) indicated that to respond to complexity, a shared governance model that empowers employees to own their workplace and adapt to changes is important. Edson (2012) discussed that a team needs to constantly scan the environment for changes. Uhl-Bien and Marion (2009) took this a step further and indicated that creative, adaptive organizations operate across boundaries, functions, roles and blend of structured and dynamic environments. Creative organizations have boundaries that can be seen as blended and fuzzy and operate in an informal way. Uhl-Bien and Marion (2009) saw informal networks and dynamics as something to be nurtured and valuable to ensuring effective change. Hannah et al. (2010) saw effective leadership as allowing members to provide each other with direction and purpose in responding to adaptive challenges. Hannah et al. referred to this as cultivating and maintaining high quality exchanges at all levels of the network. In other words, leaders should create transformational environments as a way to foster conditions to adapt to change rather than try to control change (Marion & Uhl-Bien, 2001). Individuals work together to adapt rather than relying on one specific leader to constantly react to and respond to change (Uhl-Bien & Marion, 2009).

Evolution of Complexity Leadership Research (1982-2002)

Originating in the Contingency Era of leadership theory (Van Seters & Field, 1990), the coupling of leadership and complexity was originally posed when McCall and Lombardo (1982) pointed out that leadership studies had not learned much about leadership within complex environments. McCall and Lombardo (1982) contended this was because scholars had been “defining leadership as an interpersonal influence process” (p. 533), and that the leadership literature up to that point focused “exclusively on leader-subordinate relationships, two or so styles, and group outcomes. Such a focus does not ask questions about the environment and organizational context of leadership and the impacts it may have” (p. 533).

This was the first time in leadership literature that the *outside* environmental context was suggested to be included in the leadership formula and the overall understanding of leadership. Graves (1985) later pointed out that while theories such as Contingency Theory (Hersey & Blanchard, 1977) did consider situational variables *within* the organization, they did not consider the complex and unpredictable environments *outside* the organization. Graves (1985) contended that environmental complexity outside the organization had high influence on the leadership process, and thus, deserved more attention.

Graves (1985) used Osborn and Hunt’s (1975) definition of environmental complexity, which was “the degree to which the environments are characterized by increased dependence, conflict, change, and unpredictability” (p. 23). Graves (1985) argued that understanding the environmental complexity that surrounded the leadership process was pivotal to analyze when discussing the nature of leadership. This represented a major advancement in the evolution of leadership theory (Van Seters & Field, 1990).

Hooijberg et al. (1997) fleshed out in more detail the concept of environmental complexity when they provided globalization, organizational competition, demographic changes and technological advancements as examples of external conditions outside of one’s realm of control. Thus, leaders should learn to lead in situations where they do not have control or command authority. Collier and Esteban (2000) added to the conceptualization of environmental complexity by adding organizational delayering, mergers and acquisitions, joint ventures, changing economic and political environments, and grappling with new technologies and fast-changing market conditions. These uncontrollable and unpredictable factors, when considered, made it inappropriate to characterize organizations as isolated entities. They were more usefully understood as open systems “nested within a fast-changing global systemic environment, shaping and in turn being shaped by that environment” (p. 207). This was one of the first times in the leadership literature that a systems metaphor was used to frame leadership, and organizations described as “chaotic” and “complex adaptive systems” (p. 208).

Postindustrial organizations can be redescribed as complex adaptive systems. They are complex because they are the result of multiple interconnecting relationships, so that the way they respond to the environment has the effect of creating new connections and thus increasing their complexity. They are adaptive in that they develop fit to the forces of change in environments and technologies while retaining the coherence of their own purpose. They are systemic in that they survive by exchanging energy, information, and materials with the wider ecologies of which they are a part. (Collier & Esteban, 2000, p. 208)

The type of leadership necessary for this “redescribed” organization was *systemic leadership* (Collier & Esteban, 2000). A systemic leader should create a sense of community, encourage autonomy and creativity, intend the common good in their purpose and practices, and be ethical.

Leaning on the work of Jean Piaget, Glover, Friedman, et al. (2002) argued that an *adaptive leadership* theory was appropriate to handle this new complex and unpredictable global world. There are several challenges that adaptive leaders will face. These are: 1) understanding culture and how it shapes the way an organization operates, 2) being aware of the changes in the external environmental systems and how any changes may impact the organization, 3) embrace diversity, and 4) create a holistic and sustainable vision (p. 21). For Glover, Friedman, et al. (2002), Jean Piaget’s concepts of assimilation, accommodation, and equilibration were foundational to adaptive leadership.

Assimilation

“Taking in information for which learners already have cognitive structures in place, enabling them to recognize and attach meaning to the information being received. Learning by assimilation can be illustrated by the lectures and books used in conventional classrooms. Information taken in from those sources is passively added to that which is already known.” (Glover, Friedman, et al., 2002, p. 19)

Accommodation

“In this type of learning, the learner undergoes an internal change in the structure of his or her beliefs, ideas, or attitudes. Accommodation is a much deeper level of learning that may very well engage the intellect and the heart of the learner. Experiential learning, in which a learner actively struggles with acquiring knowledge, typically is more of this sort.” (Glover, Friedman, et al., 2002, p. 20)

Equilibration

“Human adaptation occurs through the ever-present dynamic of assimilation and accommodation as we interact with our environment. He refers to this dynamic as *equilibration*. The degree to which leaders are able to achieve this dynamic equilibration process largely dictates their ability to adapt in various contextual circumstances of changing environments.” (Glover, Friedman, et al., 2002, p. 21)

Additionally, Yukl et al. (2002) pointed out the emphasis of early leadership literature on two general categories that lacked any focus on leadership for change. These two general categories were described as relations-oriented behavior and task-oriented behavior, where relations-oriented behavior was concerned with people and task-oriented behaviors were concerned with initiating organizational structure. Neither of these behaviors, however, were focused on organizational change and adaptation. Therefore, Yukl et al. (2002) argued for a third behavior that was oriented towards leadership for change. Where task-oriented behavior was focused on planning, clarifying objectives and expectations, and monitoring operations and performance; and relations-oriented behavior was focused on providing support, encouragement, recognition, personal development of employees, and empowerment; change-oriented behavior would focus on monitoring the external environment, proposing innovative strategies and new visions, and promoted innovative thinking and taking risks.

The first two decades of complexity leadership research began with a realization that leadership was much bigger than the individual and the relationships among individuals. To fully understand leadership, one needed to consider the wider contexts and environments that leaders and the leadership experience found themselves in. These wider contexts and environments were unpredictable, chaotic, and complex.

This understanding required a new way of thinking *about* leadership and *by* leadership. Leaders in the new world and new framework needed to understand systems, complexity, change, and be continuously learning.

METHODOLOGY

The research team searched the ProQuest database for manuscripts meeting the following criteria: journal articles, peer-reviewed publications (scholarly), English language, items with full text online, and within the business discipline. We used the boolean search string ("complex adaptive leadership") OR ("complexity leadership") OR ("adaptive leadership"). The search yielded just over 1,000 results. 778 manuscripts remained after accounting for duplicates and false results. We then proceeded in three stages, according to the following process.

1. Stage 1: File Preparation
 - a. downloaded the 778 files in PDF format;
 - b. applied the naming convention: <Year of Publication>_<First Author Last Name>_<Short title>.pdf;
 - c. converted each file to a searchable image (exact) optical character recognition feature of Adobe Acrobat X (this method preserved the fidelity of the original document);
 - d. imported the files into Nvivo 12 Qualitative Data Analysis Software;
 - e. assigned each manuscript as a case;
2. Stage 2: Inductive Content Analysis
 - a. performed automatic coding on the entire dataset (results reported in Tables 1 and 2)
 - b. performed code name searches for complex adaptive lead*, complexity lead*, and adaptive lead* (results reported in Table 3)
 - c. performed code name searches for complex adaptive leadership, complexity leadership, and adaptive leadership
 - d. performed code name searches within the theory node related to complex adaptive lead*, complexity lead*, and adaptive lead*
 - e. performed code name searches within the process node related to complex adaptive lead*, complexity lead*, and adaptive lead*
 - f. inspected the resultant codes for patterns
 - g. inspected and retained manuscripts in which the subject, literature review, findings, or conclusions related to complexity, adaptive, or complex adaptive leadership
 - h. copied 307 manuscripts to a new folder for deductive thematic analysis.
 - i. performed automatic coding on the reduced subset of manuscripts (results reported in Table 1)
3. Stage 3: Deductive Thematic Analysis
 - a. skimmed manuscripts to gain an understanding of high-level concepts to create a high-level classification schema
 - b. reviewed manuscripts to develop themes and subthemes related to complex adaptive leadership, complexity leadership, and adaptive leadership
 - c. coded themes and subthemes

FINDINGS

Inductive Content Analysis

We used the automatic feature of NVivo to perform inductive content analysis on 778 manuscripts. The inductive content analysis method is appropriate when research in an area is fragmented (Elo & Kyngas, 2008). NVivo organizes codes into a hierarchical structure comprising more general, higher-order nodes (parent-nodes) and more specific subnodes (child nodes; Bazeley, 2009). We adopted the terminology codes for higher-order nodes and subcodes for more specific subnodes. NVivo identified the

14 codes listed in Table 1. In aggregate, NVivo coded 70,383 references within the 14 themes. There were 24,748 subcodes, including 2,325 duplicate subcodes. Therefore, there were 22,423 unique subcodes.

**TABLE 1
CODES (SORTED BY REFERENCES, THEN FILES)**

Code #	Name	Files	References
1	leadership	702	17,163
2	management	688	5,402
3	leader	646	5,195
4	research	668	4,837
5	process	684	4,448
6	effective	642	4,130
7	team	453	3,907
8	study	638	3,762
9	model	612	3,663
10	development	647	3,632
11	social	613	3,615
12	work	608	3,602
13	change	656	3,554
14	theory	564	3,473

Table 2 reports 32 prominent subcodes (29 unique subcodes) within the 14 codes that had 100 or more references). The range of references for subcodes was 1-336 references. The most prominent subcodes were autocoded at the nodes *future research*, *effective leadership*, *transformational leadership*, *organizational change*, *empirical studies*, *empirical research*, and *complexity leadership theory*.

**TABLE 2
PROMINENT SUBCODES (WITHIN CODES, SORTED BY REFERENCES, THEN FILES).**

Code #	Code	Subcode	Files	References
1	leadership	effective leadership	167	278
2		transformational leadership	114	205
3		complexity leadership theory	100	158
4		leadership studies	95	141
5		adaptive leadership	99	136
6		leadership roles	90	127
7		leadership style	91	118
8		leadership research	79	106
9		leadership process	74	103
10	leader	effective leaders	109	148
11		individual leaders	95	131
12	research	future research	184	336
13		empirical research	112	169
14		previous research	75	112
15		leadership research	79	106
16		research question	85	103
17	process	social process	75	104
18		leadership process	74	103
19	effective	effective leadership	167	278

Code #	Code	Subcode	Files	References
20		effective leaders	109	148
21		positive effect	89	130
22		moderating effect	65	128
22	team	team members	75	111
23	study	empirical studies	120	184
24		leadership studies	95	141
25		case study	105	138
26		present study	77	137
27		previous studies	81	124
28	model	structural equation modeling	52	116
29	social	social process	75	104
30		social systems	75	103
31	change	organizational change	127	191
32	theory	complexity leadership theory	100	158

Table 3 reports subcodes related to complexity leadership, adaptive leadership, or complex adaptive leadership.

TABLE 3
COMMON SUBCODES ACROSS ALL MANUSCRIPTS
(SORTED BY REFERENCES, THEN FILES)

Code #	Subcode	Files	References
1	complexity lead*	468	1277
2	complexity leadership	468	1261
3	adaptive lead	323	1030
4	adaptive leadership	321	992
5	complexity leadership theory	175	471
6	complexity theory	172	333
7	adaptive leadership theory	36	115
8	complex adaptive	41	75
9	adaptive process	43	67
10	adaptive theory	28	55
11	complex adaptive lead*	19	43
12	complex adaptive leadership	19	43
13	complex adaptive process	15	16
14	complexity process	3	9
15	complex adaptive theory	6	7
16	complex adaptive leadership theory	0	0

We used the automatic feature of NVivo to perform inductive content analysis on the subset of 307 manuscripts. There were 29,246 references to the codes, as reported in Table 4.

TABLE 4
CODES (SORTED BY REFERENCES, THEN FILES)

Code #	Name	Files	References
1	leadership	288	8,239
2	team	196	2,426
3	leader	271	2,365
4	process	284	2,298
5	research	271	2,365
6	management	284	2,166
7	complexity	261	2,092
8	change	275	1,970
9	effective	259	1,844
10	theory	238	1,789
11	model	265	1,692

Finally, we cleaned the NVivo project to retain the subset of nine manuscripts (see Table 5) relevant to the first two decades of the analysis (1982-2002).

TABLE 5
ARTICLES USED IN DEDUCTIVE CONTENT ANALYSIS.

Name	Lead Author	Year
Using Simulation for Leadership and Management Research: Through the Looking Glass	Mcall	1982
Effects of Leader Persistence and Environmental Complexity on Leadership Perceptions: Do Implicit Beliefs Discourage Adaptation to Complex Environments?	Graves	1985
Making Leadership Effective: A Three Stage Model	Neider	1988
The Evolution of Leadership Theory	Seters	1990
Leadership As Organizing: A Critique of Leadership Instruments	Barge	1991
Leadership Complexity and Development of the Leaderplex Model	Hoojberg	1997
Systemic Leadership: Ethical and Effective	Collier	2000
Adaptive Leadership: When Change is Not Enough (Part One)	Glover	2002
Adaptive Leadership (Part Two): Four Principles for Being Adaptive	Glover	2002

NVivo identified the 14 codes listed in Table 6. In aggregate, NVivo coded 860 references within the 14 themes.

TABLE 6
CODE (SORTED BY REFERENCES, THEN FILES).

Theme #	Name	Files	References
1	leadership	9	171
2	change	8	88
3	leader	9	76
4	process	9	68
5	effective	9	66
6	theory	7	66
7	complexity	7	47
8	adaptive	3	47
9	behavior	9	46
10	management	9	44
11	performance	8	37
12	situational	9	36
13	work	8	35
14	approach	6	33

Deductive Content Analysis

We viewed the paragraphs containing the inductive codes to get a sense of the general ideas presented in the literature. We then went through an iterative process of skimming and closely reading each article, generating more granular concepts as we progressed chronologically through the literature. These concepts were grouped and categorized as themes and multiple levels of subthemes (Saldaña, 2021). During the analysis, nodes were reviewed and, if necessary, renamed; node definitions refined; nodes expanded or collapsed; and nodes re-arranged within the hierarchical structure. As the hierarchical node structure evolved, articles were revisited several times at different stages in the analysis process, and the contents of existing nodes were reviewed to ensure relevant references were captured in the most appropriate nodes. The in-depth analysis consisted of interrogating the data with the use of analytic tools in NVivo such as word search queries, word frequency queries, word trees, and coding queries. NVivo software was used to visualize the results, including charts and models.

A VUCA Environment Creates a Need for a Different Type of Leader

These themes suggested that:

- Previous leadership research had been inadequate to address the type of leadership required in VUCA environments.
- Leaders and followers are susceptible to believing that leadership persistence is beneficial, even in changing contexts. Leadership persistence measures the stability of a leadership style or approach, suggesting that the leaders and followers believe that the leadership style or approach remains the same, independent of circumstances.
- Variety in leader behavior is critical for effective leadership in VUCA environments

Environmental Complexity Can Take on Many Definitions

Within this theme, the following subthemes emerged:

- The personal characteristics required of adaptive leaders: Adaptive leaders make effective decisions based on changing contexts. They are innovative. They alter organizational systems to stay in harmony with the environment. Adaptive leaders balance the needs inherent at the point in time and space. They maintain a stance of continuous learning and environmental scanning. They maintain holistic and culturally relative perspectives, shifting and aligning cultures to new contexts. They are open to changes in the environment. They use available

information to make sense of the context and to improve their responses. They use sense and response tools.

- The personal characteristics required of complex adaptive leaders: Effective leaders of complex adaptive systems are adaptive, culturally intelligent, emotionally intelligent, socially intelligent, ethical, transactional, and transformational.
- The personal characteristics of systemic leaders: Effective systemic leaders engender openness, trust, respect, supportiveness, commitment, cooperation, and judgment.
- Leaders and followers negotiate a workable relationship
- There is a need for shared and distributed leadership

Characteristics of Complex Adaptive Systems

These themes demonstrated that Complex Adaptive Systems have certain characteristics. Within this theme, the following subthemes emerged:

- Complex Adaptive Systems are adaptive
- Complex Adaptive Systems are complex
- Complex Adaptive Systems exhibit emergence
- Complex Adaptive Systems are generative
- Complex Adaptive Systems have interconnecting relationships
- Complex Adaptive Systems are participative
- Complex Adaptive Systems are self-organizing
- Complex Adaptive Systems are systemic
- Complex Adaptive Systems are unpredictable
- Effective leaders within Complex Adaptive Systems are characterized as socially, emotionally, and culturally intelligent

Environmental Characteristics Are Important

- Environmental complexity affects leader behavior as well as subordinate satisfaction and performance
- The pace of change has quickened

Organizational Characteristics Are Important

- Boundaries between leaders and followers are thinning or disappearing
- Boundary-crossing leadership is necessary to overcome issues related to social complexity
- Cannot rest on past successes
- Communication as relationship-building rather than sender-receiver
- Continuous learning is essential to enable the processing of vast amounts of incoming data
- Environmental scanning is critical
- Organizational members must be attentive to the environment
- Shared knowledge-management practices are essential
- Successful performance in complex environments relates to organizational structure

Characteristics of Systemic Leadership

- Systemic Leadership is leadership capability developed through the diffusion of the leadership function throughout the organization; however, it is not shared or collective. It is a relational and political process subject to influence and coalition-building as organizational actors seek mutual purpose and the common good emerges.
- Systemic leadership flourishes when information flows through open lines of communication.

- Systemic leadership requires that each person be an autonomous agent with the power of judgment and accountable for their performance.
- Systemic leadership nurtures community through engagement, the pursuit of excellence, and shared purpose.
- Systemic leadership results in communities of discernment that aspire to the common good.
- Systemic leadership creates communities of practice that foster generative learning.
- Systemic leadership requires the management of paradoxes, notably hierarchy-participation, unity-diversity, asymmetry-mutuality, discipline-creativity, and creation-destruction.

DISCUSSION

The analysis covered the years 1982-2002. Scholars appeared to be going through conceptual hand-wringing over the body of leadership knowledge. For example, McCall and Lombardo (1982) speculated that a focus on leadership as an influence process within the leader-follower dyad and the overuse of the survey method to study leadership resulted in the fact “that we have not learned very much about leadership in complex organizations” (p. 533). Hooijberg et al. (1997) argued that the theory had not kept pace with the implications of the changing nature of work on leaders, while Neider and Schriesheim (1988) emphasized that leadership theory did not help managers increase their effectiveness. There appeared to be a general recognition that problems existed in the conceptualization of leadership as done on followers by leaders (Van Seters & Field, 1990), a lack of hands-on research (Neider & Schriesheim, 1988), a lack of reliable, and valid leadership measures (Barge & Schlueter, 1991).

The analysis demonstrated the beginnings of a shift in the conceptual understanding of leadership during the period from 1982-2002. Scholars recognized that previous leadership theories inadequately addressed leading in change and transformation (Glover, Friedman, et al., 2002; Glover, Rainwater, et al., 2002) or VUCA environments (Collier & Esteban, 2000; Glover, Friedman, et al., 2002; Glover, Rainwater, et al., 2002; Graves, 1985; Hooijberg et al., 1997). Scholars began comparing organizational systems with biological systems, generating insights through the rich analogies between organizations and organisms. However, the authors stopped short of referencing implicit theories such as complexity, complex adaptive systems, chaos, or other scientific theories that became more common in later studies. There was a single reference to *open systems theory* (McCall & Lombardo, 1982). Furthermore, these early treatments were exclusively descriptive and theoretical, as our analysis found no research-based methodological studies.

The sample of nine articles used in this analysis covered many concepts related to current conceptions of complex adaptive leadership theories. For example, themes related to characteristics of complex adaptive systems emphasized adaptation, emergence, boundary spanning, and autonomous agents. Themes related to the characteristics of leaders within complex adaptive systems emphasized relational aspects, co-creative leader/follower relationships, communicating across boundaries, and environmental scanning. Our knowledge of the full scope of literature guided our development of themes. Thus, some concepts identified as themes were well-represented, while others were nascent and received less attention in the manuscripts. Nonetheless, this small sample demonstrated that many foundational concepts of complexity leadership formed during the reviewed period.

Limitations, Implications and Future Research

There are several limitations with the current study. First, there is always the danger when providing a comprehensive search that the results did not adequately cover all of the elements of the theory. Though the process used was rigorous and this was controlled by using multiple search terms within complexity research, there is a possibility that a study could have been missed. Though this is a common problem with meta-analysis research, the authors are confident that any missed studies did not change the outcome of the results. Second, the research assumes and focuses solely on an Anglo-Saxon English language search. This could result in potential cultural biases within the research and a lack of inclusivity within the complexity leadership literature. Therefore, it is entirely plausible that values from non-Westernized theorists are

omitted from the research. Finally, though the theorists attempted to define the theory in a distinctive period, the research could have overlapped periods that would impact the study results.

This study offers several directions for future complex adaptive leadership studies. First, this study focused on the first decades of complex adaptive leadership. In the past two decades, complex adaptive leadership research has increased significantly. Therefore, future studies should investigate the past twenty years of research. Second, the study, coupled with further thematic analysis, could lead to the development of a complex adaptive leadership assessment. The identification of major themes in the unit is a good first step in theory unification and the development of an assessment. Future work should develop an assessment at the various unit levels (individual, organization, societal, etc). The possibilities for research in this emergent theory is endless and we call on scholars to continue to investigate leadership in complex adaptive systems.

CONCLUSION

Complexity Leadership, Complex Adaptive Leadership, and Adaptive Leadership Theory can be traced back four decades to the early 1980s. Research on the subjects was scant during the first two decades but progressed rapidly after 2002. The current research examined seminal articles that formed a foundation for subsequent work on complexity leadership.

The research team extensively searched academic literature within the business discipline for journal articles related to *complex adaptive leadership*, *complexity leadership*, and *adaptive leadership*. The researchers reviewed 778 manuscripts using inductive analysis through NVivo quantitative data analysis software. A sample of 307 articles related more specifically to *complex adaptive leadership*, *complexity leadership*, and *adaptive leadership*. Only nine of the 307 articles were published prior to 2003.

Analysis from the first two decades of research on complexity leadership theories revealed frustration by some leadership scholars over the ability of leadership theory to address practical leadership problems. Therefore, scholars called for and began to develop novel approaches that expanded leadership theory beyond concepts of leader-follower influence. Scholars turned their attention to understanding the role of leadership within VUCA contexts. They began to conceive of organizations as open systems and to describe characteristics that leaders would need to be successful in complex adaptive systems. These early attempts set the stage for scholars to apply complexity theory to the study of leadership.

REFERENCES

- Apenko, S., & Chernobaeva, G. (2016). *The influence of complex adaptive leadership on the efficiency of business management*. Kidmore End.
- Backlander, G. (2019). Doing complexity leadership theory: How agile coaches at Spotify practice enabling leadership. *Creativity and Innovation Management*, 28(1), 42–60. <https://doi.org/10.1111/caim.12303>
- Barge, J.K., & Schlueter, D.W. (1991). Leadership as organizing: A critique of leadership instruments. *Management Communication Quarterly*, 4(4), 541–570. <https://doi.org/10.1177/0893318991004004007>
- Bazeley, P. (2009). Editorial: Integrating data analyses in mixed methods research. *Journal of Mixed Methods Research*, 3(3), 203–207. <https://doi.org/10.1177/1558689809334443>
- Bergquist, W.H. (1993). *The postmodern organization: Mastering the art of irreversible change*.
- Campbell, C.A. (2013, Winter). Reflections on leadership. *Perspectives in Health Information Management*, 10.
- Chadwick, M.M. (2010). Creating order out of chaos: A leadership approach. *AORN Journal*, 91(1), 154–170. <https://doi.org/10.1016/j.aorn.2009.06.029>
- Collier, J., & Esteban, R. (2000). Systemic leadership: Ethical and effective. *Leadership & Organization Development Journal*, 21(4), 207–215. <https://doi.org/10.1108/01437730010335454>

- Crain, K., Hunt, S., & Schmidt, R.N. (2020). Adaptive telemedicine care: Pre/post COVID-19 pandemic. *Journal of Business and Educational Leadership, 10*(1), 58–70.
- Day, D.V., & Harrison, M.M. (2007). A multilevel, identity-based approach to leadership development. *Human Resource Management Review, 17*(4), 360–373. <https://doi.org/10.1016/j.hrmr.2007.08.007>
- Edson, M.C. (2012). A complex adaptive systems view of resilience in a project team. *Systems Research and Behavioral Science, 29*(5), 499–516. <https://doi.org/10.1002/sres.2153>
- Elo, S., & Kyngas, H. (2008). The qualitative content analysis process. *J Adv Nurs, 62*(1), 107–115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>
- Glover, J., Friedman, H., & Jones, G. (2002). Adaptive leadership: When change is not enough (part one). *Organization Development Journal, 20*(2), 15–32.
- Glover, J., Rainwater, K., Jones, G., & Friedman, H. (2002). Adaptive leadership (part two): Four principles for being adaptive. *Organization Development Journal, 20*(4), 18–38.
- Graves, L.M. (1985). Effects of leader persistence and environmental complexity on leadership perceptions: Do implicit beliefs discourage adaptation to complex environments? *Group & Organization Studies, 10*(1), 19–36. <https://doi.org/10.1177/105960118501000102>
- Hannah, S.T., Campbell, D.J., & Matthews, M.D. (2010). Advancing a research agenda for leadership in dangerous contexts. *Military Psychology, 22*(S1), S157–S189. <https://doi.org/10.1080/08995601003644452>
- Hazy, J.K. (2008). Toward a theory of leadership in complex systems: Computational modeling explorations. *Nonlinear Dynamics, Psychology, and Life Sciences, 12*(3), 281–310.
- Heifetz, R., Grashow, A., & Linsky, M. (2009a). Leadership in a (permanent) crisis. *Harvard Business Review, 87*(7–8), 62–153.
- Heifetz, R., Grashow, A., & Linsky, M. (2009b). *The practice of adaptive leadership: Tools and tactics for changing your organization and the world*. Harvard Business Press.
- Hersey, P., & Blanchard, K.H. (1977). *Management of organizational behavior: Utilizing human resources*. Prentice-Hall, Englewood Cliffs, London, United Kingdom.
- Hooijberg, R., Hunt, J.G., & Dodge, G.E. (1997). Leadership complexity and development of the leaderplex model. *Journal of Management, 23*(3), 375–408. [https://doi.org/10.1016/S0149-2063\(97\)90036-2](https://doi.org/10.1016/S0149-2063(97)90036-2)
- 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](https://doi.org/10.1016/S1048-9843(01)00092-3)
- McCall, M.W., Jr., & Lombardo, M.M. (1982). Using simulation for leadership and management research: Through the looking glass. *Management Science, 28*(5), 533–549. <https://doi.org/10.1287/mnsc.28.5.533>
- Neider, L.L., & Schriesheim, C.A. (1988). Making leadership effective: A three stage model. *The Journal of Management Development, 7*(5), 10–20. <https://doi.org/10.1108/eb051687>
- Nelson, T., & Squires, V. (2017). Addressing complex challenges through adaptive leadership: A promising approach to collaborative problem solving. *Journal of Leadership Education, 16*(4), 111–123. <https://doi.org/10.12806/V16/I4/T2>
- 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](https://doi.org/10.1016/S1048-9843(02)00154-6)
- Parks, S.D. (2005). *Leadership can be taught: A bold approach for a complex world*. Harvard Business Review Press.
- Raney, A.F. (2014). Agility in adversity: Integrating mindfulness and principles of adaptive leadership in the administration of a community mental health center. *Clinical Social Work Journal, 42*(3), 312–320. <https://doi.org/10.1007/s10615-014-0487-0>
- Saldaña, J. (2021). *The coding manual for qualitative researchers* (Fourth edition. ed.). SAGE.
- Senge, P.M. (1992). The fifth discipline. The art and practice of the learning organization. *Century Business*.

- Tsai, Y.-S., Poquet, O., GaA evic, D., Dawson, S., & Pardo, A. (2019). Complexity leadership in learning analytics: Drivers, challenges and opportunities. *British Journal of Educational Technology*, 50(6), 2839–2854. <https://doi.org/10.1111/bjet.12846>
- Uhl-Bien, M. (2021). Complexity leadership and followership: Changed leadership in a changed world. *Journal of Change Management*, 21(2), 144–162. <https://doi.org/10.1080/14697017.2021.1917490>
- 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>
- 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>
- Uhl-Bien, M., Marion, R., & Meindl, J.R. (2007). *Complexity leadership: Part 1: Conceptual foundations*. Information Age Publishing, Incorporated.
- Van Seters, D.A., & Field, R.H.G. (1990). The evolution of leadership theory. *Journal of Organizational Change Management*, 3(3), 29–45. <https://doi.org/10.1108/09534819010142139>
- Weberg, D. (2012). Complexity leadership: A healthcare imperative. *Nursing Forum*, 47(4), 268–277. <https://doi.org/10.1111/j.1744-6198.2012.00276.x>
- Wilson, S. (2020). Pandemic leadership: Lessons from New Zealand’s approach to COVID-19. *Leadership*, 16(3), 279–293. <https://doi.org/10.1177/1742715020929151>
- Yukl, G., Gordon, A., & Taber, T. (2002). A hierarchical taxonomy of leadership behavior: Integrating a half century of behavior research. *Journal of Leadership & Organizational Studies*, 9(1), 15–32. <https://doi.org/10.1177/107179190200900102>