Emergent leadership and the Medusa principles

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ABSTRACT

This research study explores the role of leadership in a complex context. Aim of the article is to give answer to the question What can leadership do to support the emergence of innovation in a complex context? First, clarity is given on the concepts used in the research question: complexity, emergence, innovation and leadership.

Thereafter a literature search was conducted to answer the research question. The topics 'emergent leadership' or 'complexity leadership' were chosen for an exploratory search in Google and Google Scholar using the berry picking method. Exclusion criterion was emergence in other disciplines than organizational development or in the meaning of 'arising'. The useful conclusions from the articles were merged and grouped together under overarching topics.

The findings are that 5 topics prevail when looking at possibilities for leadership to facilitate innovation: enabling, sharing values, dreaming, interacting, context sensitivity and adaptivity.

Keywords: *leadership, complexity science, emergence, emergent leadership, innovation*

INTRODUCTION

Many quality improvement activities are planned. Leaders are strongly involved in missions, visions and strategic planning. They use, consciously or unconsciously, the PDCA-cycle (Deming, 1993). After the planning, the plans are carried out and the results or effects are measured. If the results show that the goals in the plan have not been achieved, adjustments are made in the next plan or in the execution of the processes. Then, the cycle is run through again. Traditionally, the PDCA-cycle is advocated as a means to an end. Under the title 'The Myth of the PDCA cycle in times of emergent change', I questioned the role of the PDCA-cycle being the centre of quality management thinking for ages (Van Kemenade,2014). Since, PDCA is especially fit for planned, ordered, certain contexts. It fits with what Van Kemenade and Hardjono (2018) call the empirical and referential quality paradigm. For uncertain, unordered, unplanned processes, something else might be needed instead of Plan-Do-Check-Act. Due to the complexity of our society, the influence of the context, and the uncertainty in our world

nowadays, not every activity can be planned anymore. At the same time organisations need to be more innovative than ever. That provides leaders with a problem. How to innovate without being able to plan? In my training of leaders (mostly working in healthcare) this topic is raised continuously. Looking for an answer I encountered complexity science and the phenomenon of emergence. Complexity science studies the interactions of a diverse group of agents that bring about change in times of uncertainty, e.g. when radical innovation is co-created. This process is called emergence. Van Kemenade and Hardjono (2018) and Van Kemenade (2019) described the concept of emergence of innovation in (total) quality management.

Van Kemenade(2019) defines emergence as 'the phenomenon where out of a network of interacting internal and external elements over time arises a coherent new pattern, that is different from its parts, irreducible to the separate parts unpredictable, unexpected and unplanned'.In the words of Ablowitz (1939) emergence accounts for the transformation of quantity into quality. If emergence can create

innovation without planning in uncertain contexts, an important follow-up question is, if and how emergence can be facilitated, especially by leadership in and between organizations? Actually, this means that like many others do, I am searching for what Johnson (2009) calls the Holy Grail of Complexity Science: control of emergence. For that purpose, I undertook a simple literature review. Aim of this article is to give answer to the question What can leadership do to support the emergence of innovation in a complex context? First, the next paragraph gives clarity on the concepts used in the research question: complexity, emergence, innovation and leadership.

Thereafter a literature search was conducted to answer the research question. The topics 'emergent leadership' or 'complexity leadership' were chosen for an exploratory search in Google and Google Scholar using berry picking (Bates, 1989).

Exclusion criterion was emergence in other disciplines than organizational development or in the meaning of 'arising'. The useful conclusions from the articles were merged and grouped together under overarching topics.

DEFINITION OF CONCEPTS

Complexity

Crucial now in leadership training is the notion of complexity. Complexity theory, which is the study of nonlinear dynamic systems promises to be a useful conceptual framework that reconciles the essential unpredictability of industries with the emergence of distinctive patterns (Cartwright 1991). Complexity theory became the study of the patterns that emerge as non-linear, networked systems evolve. Johnson (2009) adopts the definition of "complexity science" as "the study of the phenomena which emerge from a collection of interacting objects". Where Stacey et al. (2000) talk about complex responsive processes, others call these Complex Adaptive Systems(Goodwin, 1994, Holland, 1995).In complex adaptive systems, the whole (integrated care e.g.) is different than its parts (the separate healthcare institutes) and more complicated and meaningful than the aggregate of its parts. Complexity theory accepts the far-from-equilibrium wherein novelty may emerge. Systems thinking might be more familiar to the reader and it does have a lot in common with complexity theory. However, where systems theory tries to keep or get control, in complexity theory "people jointly create the meaning of what they are doing when they act into the un-known, co-creating their future in interaction with others" (Stacey et al, 2000, p. 194).
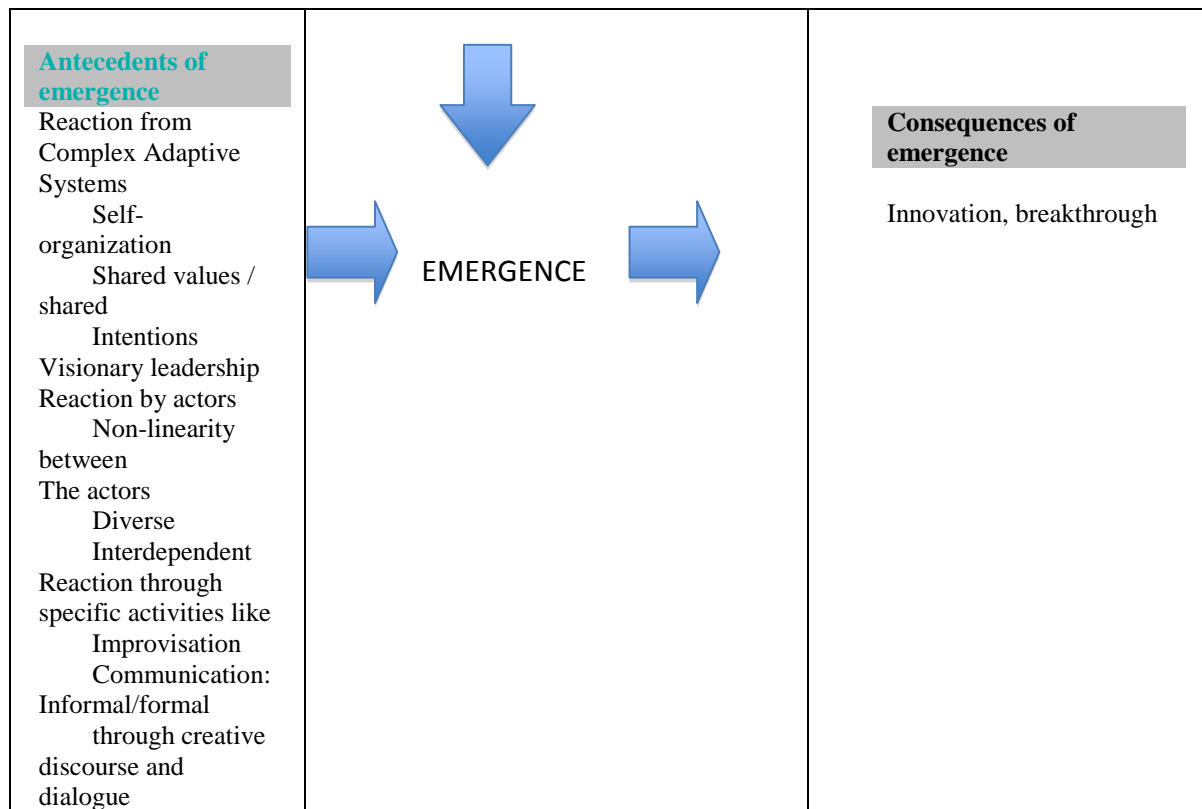
Emergence

Emergence is a phenomenon that one can recognize in disciplines from biology to organizational development. It can be seen in ants building a termite hill, in a flock of sparrows or in radical innovation in business. Sometimes it is referred to as collective intelligence. Van Kemenade (2019) conducted a concept analysis of emergence following Walker and Avant (2014).

That led to attributes, antecedents and consequences of emergence (see table I). The antecedents describe what happened before the novelty occurred. They might hint to what one can do to make emergence happen: the reaction from complex adaptive systems, the reaction by the actors and reaction through specific activities. The main consequence of emergence is innovation.

Table1. *Antecedents, attributes and consequences of emergence according to Van Kemenade (2019).*

	Attributes of emergence	
	• Interaction/synergy between internal and external elements • That occur at the same time (synchronicity) • Unpredictable • Unexpected • Unplanned • Leading to a new coherent pattern (novelty) • Irreducible to the separate parts.	

Emergent Leadership

Antecedents of emergence		Consequences of emergence
Reaction from Complex Adaptive Systems		
Self-organization	EMERGENCE	Innovation, breakthrough
Shared values / shared		
Intentions		
Visionary leadership		
Reaction by actors		
Non-linearity between		
The actors		
Diverse		
Interdependent		
Reaction through specific activities like		
Improvisation		
Communication: Informal/formal		
through creative discourse and dialogue		

Innovation

Rogers describes innovation as: Any idea, practice, or object that is perceived as new by an individual or other unit of adoption(Rogers, 1983, p. 11). In the emergence paradigm one speaks of novelty or radical innovation (Hardjono and Van Kemenade, 2020). Radical innovation is comparable to what Shiba & Walden (2006) call breakthrough. The breakthrough can happen by a technology change, finding different customers or a supply-chain change (Shiba & Walden, 2006, p. 27). There is a debate on the extent to which innovation can be created by leadership.

Leadership

Scientists disagree on how much influence leaders can have on the emergence of innovation. Northouse (2015, p 6) defined leadership as 'a process whereby an individual influences a group of individuals to achieve a common goal' . However, that is a limited definition, leadership nowadays is more a process that expands beyond the capabilities of the individual, where leadership itself is an emergent event, a product of 'relationships, complex interactions, and influences that occur in the "spaces between" individuals' (Lichtenstein et al., 2006). Or: leadership is a complex process that emerges in the interactive 'spaces between' people and ideas.

Understanding the character of interaction between individuals is where the associated paradigms of complexity, emergence and leadership converge (Lichtenstein et al., 2006; Goldstein, 2008).

Poutanen et al. (2016) state that the complexity science perspective guides innovative managers and organizations to focus on the conditions that favour innovation rather than control. Lichtenstein (2009) pleas for 'opportunity tension' as a driver for emergence. Opportunity tension is not a state, but 'a drive: 'an intensive push by the entrepreneurial leader(s) to capitalize on a time-sensitive opportunity, which is internally motivated by a felt urgency to take action now' (Lichtenstein, 2009, p.20). Lichtenstein puts it loud and clear: "Emergence is driven by entrepreneurial behaviour: someone sees a potential, an opportunity, a chance to generate value; and they put their passionate agency into making it real in the world" (Lichtenstein, 2015, p.5). However, complexity science reframes leadership by focusing on the dynamic interactions between all individuals, explaining how those interactions can, under certain conditions, produce emergent outcomes(Lichtenstein and Plowman, 2009). Others argue that a state of far-from-equilibrium increases innovation (e.g. Nonaka, 1988; Smith and Comer, 1991). In the complexity approach, "leadership" is not considered to be a person or

persons. Rather, it is the recognizable pattern of organizing activity among autonomous heterogeneous individuals as they form into a system of action (Lichtenstein et al., 2006; Hazy, Goldstein andLichtenstein, 2007; Uhl-Bien et al., 2007, Hazy and Uhl-Bien, 2012). Or even, like Johnson calls it:The emergent phenomena typically arise in the absence of any sort of "invisible hand" or central controller (Johnson, 2009, p. 15).

Shared leadership

Leadership is not anymore limited to the individual formal assigned leader. In complex contexts shared leadership is often preferred (e.g. Zappalla et al., 2018). Complexity leadership theory (CLT) (Uhl-Bien 2006; Uhl-Bien and Marion 2009,) offers an interesting relational approach to leadership by viewing leadership as an emergent dynamic of different leadership functions that exceed the attempts of individual position holders. Shared leadership has been defined as "a dynamic, interactive influence process among individuals for which the objective is to lead one another to the achievement of group or organizational goals or both" (Pearce and Conger, 2003, p.1). Zappalla et al. (2018) state that what distinguishes shared leadership from traditional forms of leadership is that the process of influencing team members is no longer a skill or role attributed to a single person, the appointed or elected leader; instead, it is broadly distributed within the team and involves downward and upward influences as well as peer or lateral ones. He refers to Barnett and Weidenfeller (2016) and Pearce and Conger (2003). And it is known that shared leadership fosters the emergence of novelty (Hoch, 2013). Marion and Uhl-Bien state: Complexity provides a bottom-up model of emergence, with complex leaders bonding (direct) and enabling (indirect) rather than controlling the interactive dynamics that lead to creativity and fitness (Marion and Uhl-Bien, 2002). Lichtenstein et al. (2006b) stress how important shared leadership is for innovation. By focusing on how leadership may occur in any interaction, this new perspective dramatically expands the potential for creativity, influence, and positive change in an organization. More than simplistic notions of empowerment, this approach encourages all members to be leaders – to "own" their leadership within each interaction, potentially evoking a much broader array of responses from everyone in an organization. (page 8). That is confirmed by Kakar (2017) who states that vertical leadership was found to have a higher positive impact on team efficiency, shared leadership was found to have a higher positive impact on team innovation. Similarly, Hooker andCsikszentmihalyi (2003) state that: "As organisations increasingly need innovative and creative ideas (i.e. the transformation of knowledge) in the face of rapidly changing market environments, shared leadership may provide useful and timely assistance in boosting innovative potential (p. 219).

In general, we now know that complex adaptive systems play a part to create emergence of innovation. Leaders can support this process. Shared leadership fosters the emergence of novelty and innovation. But still, the following research question remains to be answered: what exactly can leadership do to support the emergence of innovation in a complex context?

FINDINGS

The literature search conducted gave 45 hits. Twenty-seven articles were excluded after reading the title and abstract because they did not research the topic of emergent leadership and complexity. After reading the remaining articles as a whole one more was excluded because the article used emergent in the limited meaning of 'arising' and eight more were excluded because the topic did not match the research question of this article. That brings the total of the search to 17 articles.Table II presents the findings of these 17 articles on leadership leading to a new emergent order gathered in 6 themes (between brackets you read a Dutch equivalent for the topic).

Table2. *Findings of the literature search*

	Literature
Enabling **(Mogelijk maken)**	Catalysing adaptive dynamics (by fostering interaction, fostering interdependency and injecting adaptive tension—all mechanisms of CAS dynamics (Uhl- Bien et al., 2007).
Enabling by improvisation	Leadership promotes experimentation (Hazy & Uhl-Bien, 2012) Innovation emerges through improvisational processes (Sawyer, 2015) Improvisation (Van Kemenade, 2019)
Enabling by simple rules	Conditioning through new simple rules (Macintosh & Maclean, 1999) Establishing and reinforcing simple principles (Bäcklander,2018)

	the reaction by simple rules (Van Kemenade, 2019)
Enabling by a creative dialogue	The reaction through creative discourse and dialogue (Van Kemenade, 2019); dialogical leadership capabilities (Craps et al.,2019) Facilitating and encouraging constructive dialogue (Bäcklander, 2018)
Shared values (Eenheid smeden)	Values act as organisers or "attractors" of disorder (Dolan et al. 2000) Reaction from CAS: shared values (Van Kemenade, 2019) Having a philosophy to share (Imholte, 2019)
Dream (Dromen)	The reaction by visionary leadership (Van Kemenade, 2019) Leadership Synthesizes Overlapping Models & Identities (Hazy & Uhl-Bien, 2012) Sense-making from patterns and symbols (Plowman et al. 2007, Lichtenstein & Plowman, 2009, Yezdany et al., 2015) Open innovative strategy (Poutanen et al., 2016)
Interaction by diverse and interdependent actors (Uitwisselen)	Leadership Orchestrates Individual, Group & Intergroup Connections (Hazy & Uhl-Bien, 2012) Cultivated participation, interaction and influence between individuals across all levels of the organization (Yezdany et al. 2015) Interaction by diverse and interdependent actors (Van Kemenade, 2019) Multi-actor governance brings together people with diverging, often conflicting perspectives on problems, possible solutions and suitable courses of action. (Craps et al. 2019).
Context sensitivity (Snuif de context op)	Self-organization of the system parts (e.g. the possibility to organize and re-organize according to swiftly changing environmental conditions)(Poutanen et al.,2016) Reaction from CAS: Self-organization and context sensitivity (Van Kemenade, 2019, 2021)
Adaptivity (Aanpassen)	Adaptiveness (e.g. ambidexterity, or balancing between exploitation and exploration) (Poutanen et al., 2016, Uhl-Bien et al. 2007)
Adaptive by communication	Promoting High-Bandwidth Information Sharing (Hazy et al & Uhl-Bien, 2012) Adaptive leadership drives emergence bytheinvolvement of people, bottom- up communication, personal power, and impact of people on one another. (Horvat, 2017) The reaction by often informal communication (Van Kemenade, 2019) Interconnectedness (e.g. rich communication across the organization) (Poutanen et al. 2016)
Adaptive by feedback	Managing feedback processes (Macintosh & Maclean, 1999) Stabilizing feedback (Lichtenstein & Plowman, 2009)

CONCLUSION

The content of the articles leads to six topics: enabling, shared values, dream, interaction, context sensitivity and adaptivity. In Dutch these form the acronym Medusa.

Topic 1. Enabling (Dutch: Mogelijk maken)

Uhl- Bien et al.(2007,2009) identify 3 broad types of leadership: (1) leadership grounded in traditional, bureaucratic notions of hierarchy, alignment, and control (administrative leadership); (2) leadership that structures and enables conditions in which complex adaptive systems (CAS) can optimally address creative problem solving, adaptability, and learning (enabling leadership); and (3) leadership as a generative dynamic that underlies emergent change activities (adaptive leadership). In line with complexity leadership theory, efficiency can only be achieved if managers enable, rather than control, informal network dynamics (i.e., enabling and adaptive functions).

Macintosh and Maclean (1999) state that leadership can influence the 'transformation from one archetype to another' by conditioning, creating far-from-equilibrium conditions and managing the feedback processes.

Vera and Crossan (2014) state the importance of improvisation specifically theatrical improvisation for organisations. Sawyer (2015) describes the effect of improvisation as an enabler of innovation.

Bäcklander (2018) mentions the following characteristics of enabling leadership: increasing the context-sensitivity of others, supporting other leaders, establishing and reinforcing simple principles, observing group dynamics,

surfacing conflict and facilitating and encouraging constructive dialogue.

Topic 2. Creating shared values (Dutch: Eenheid smeden)

Imholte (2019) studied the emergence of a leader in a sports team without formal leadership titles. Findings revealed 4 main themes: navigating personal on-the-field failure, fulfilling others' expectations, helping teammates manage emotions, and fostering a fun working environment. Findings also indicated 1 foundational theme, having a philosophy that grounded the 4 main themes. This relates to the importance of (shared) values as a reaction of a complex adaptive system to create novelty (Van Kemenade, 2019). This is confirmed by Dolan et al. (2000), who see values as attractors for the disorder that leads to innovation.

Topic 3. Dream (Dutch: Dromen)

Hazy & Uhl-Bien (2012) state that leadership synthesizes overlapping models and identities. Also Plowman et al. 2007, Lichtenstein & Plowman, 2009 and Yezdany et al., 2015 stress the role of sense-making from patterns and symbols. It helps to understand the way towards a desired novel future. Yezdani et al. (2015) explore a model-centred approach to augment the development and refinement of the theory of emergence. The focus is on the relational process of leadership as an emergent event in complex human organisations. Complexity theory applies an understanding of leadership and organisation less as an art of prediction, and more as one of sense-making, cultivated participation, interaction and influence between individuals across all levels of the organisation where leadership itself is viewed as an emergent event.

Topic 4. Interaction (Uitwisseling)

Emergence is the phenomenon where out of a network of interacting internal and external elements over time arises a coherent new pattern, that is different from its parts, irreducible to the separate parts unpredictable, unexpected and unplanned (Van Kemenade, 2019). Several researchers stress the importance of this interaction (like Yezdany et al. 2015, Uhl-Bien et al., 2007 and Crapset al., 2019).

Leadership behaviors have the potential to foster the conditions necessary for emergence to occur through interactions with members across all levels of an organization, a concept that

Macintosh and Maclean (1999) call conditioned emergence. Leadership can have an influence on the 'transformation from one archetype to another' by conditioning, creating far-from-equilibrium conditions and managing the feedback processes. Others like Tommasetti et al. (2019) talk about co-creation. Often, the customer participates in this co-creation process. Craps et al. (2019) state that multi-actor governance brings together people with diverging, often conflicting perspectives on problems, possible solutions, and suitable courses of action. Leadership is enacted in 'relational practices' that can connect discordant ideas through the qualities of reflexivity and reciprocity in shared activities. As leadership develops out of and through the relations and interactions in the network, it is an emergent construction and not a given top down or outside–in facilitating force. Strengthening and promoting leadership practices according to the needs of the situation, thus, requires participants developing together reflexivity. It always is a matter of co-creation (Van Kemenade, 2012).

Topic 5. Context-sensitivity (Dutch: Snuif de context op)

Poutanen et al. (2016) conclude their research on complexity and innovation as follows: the complexity science perspective guides innovative managers and organizations to focus on the conditions that favour innovation rather than control. Key elements that are necessary for the emergence of a new order, according to the complexity perspective, include permeable boundaries (e.g. open innovation strategy), interconnectedness (e.g. rich communication across the organization), self-organization of the system parts (e.g. the possibility to organize and re-organize according to swiftly changing environmental conditions), and adaptiveness (e.g. ambidexterity, or balancing between exploitation and exploration). In two articles Van Kemenade stresses the importance of context sensitivity for leaders to be able to create innovation in swiftly changing circumstances.

Topic 6. Adaptive leadership (Dutch: Aanpassen)

Leadership flexibility or adaptiveness was mentioned by many articles (Poutanen etal., 2016, Uhl-Bien et al. 2007, Horvat, 2017, Van Kemenade, 2019, Macintosh and Maclean, 1999, Lichtenstein and Plowman, 2009). Horvat (2017) states that there is a significant dependency between adaptive leadership and

improvement, innovation, and learning maturity. In Complexity Leadership Theory, adaptive leadership drives emergence. By employing the benefits of adaptive leadership, such as involvement of people, bottom- up communication, personal power, and impact of people on one another, it is possible to foster effective organizational changes for a greater performance level.

DISCUSSION

Aim of this article was to clarify how leadership can foster the emergence of innovation. The literature review helped to adjust the leadership focus taking uncertainty and complexity into account. The Medusa-model seems to apply to leaders, individually and in a shared leadership setting. It supports the emergence of novelty. Lichtenstein (2011) makes a distinction between three degrees of emergence: order emergence, systemic emergence and radical emergence. The PDCA-cycle might be useful in the two lower degrees. Several scientists state that organizations can engage in ongoing innovation by harnessing and embracing complexity rather than reducing it (Brown & Eisenhardt, 1997; Van de Ven et al., 1999, Garud et al. 2013). The question to what extent the Medusa principles apply to everyone in every position, in the same way, needs further investigation by a more systematic literature review.

EPILOGUE

Medusa was a Greek mythological figure. She was the love baby from Phorcus (a simple God of the Sea) and his sister Ceto (a sea monster). Medusa became a beautiful woman with extraordinary, beautiful hair. Everyone liked her and many men asked for her hand. She rejected them all. Then she gets into a far-from-equilibrium. The beautiful girl is seduced and raped on the shrine in the temple of Athena by Poseidon, the greater God of the sea. Athena is furious, however, she does not punish Poseidon, but Medusa. Her hair is transformed into snakes; everyone who looks at her transforms into stone. In the end the 'hero' Perseus comes and decapitates her. A terrible drama. And yet, in a sort of co-creation between Medusa's blood and the sea, two great kids emerge:Chrysoar, a pirat and a strong sword-fighter who continuously improves himself until he becomes a king and Pegasus, an amazing horse that as a unique innovation can fly and bears thunder and lightning for the Supreme God Zeus.

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