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Generative learning management

A dual-role model for creativity in organizations

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Generative learning management – A dual-role leadership model for creativity in organizations

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Abstract

A main purpose of this thesis was to develop a model of leadership style named Generative Learning Management (GLM), thought to influence goal-oriented interpersonal creativity in organizations, and to test this model. Creativity is a complex consisting of both novelty and usefulness and it is a general mental ability that is determined by the interplay between different regions in a normally functioning human brain. In organizational psychology, neurobiology and connectionist theory have been used as an analogy with the purpose to describe knowledge exchange for problem-solving. The conclusion based on this reasoning is that creative ability within an organization is manifested through inter-personal exchange processes and that this process can be triggered by the intervention of a challenging goal. Leadership is therefore most often defined as a process whereby an individual influences a group of people to attain a common goal. In addition, in GLM another important factor is added: decentralization of decision making concerning goal attainment. Another aim in the thesis was to explore the influence of participative decision-making in different types of organizations, and also to test the relation between Generative learning management and the Creative climate questionnaire (CCQ; Ekvall, 1996). The results from empirical papers on the one hand supported the hypotheses presented in the first, theoretical, paper, and on the other hand, rejected any overall relation with CCQ. The conclusion from a fourth paper is that participative decision-making is best applied when the culture of the organization is member-oriented, as in a farmers' cooperative and when people come together to develop strategies for goal attainment. If the culture of the organization is not member-oriented, the application of decisions concerning, for example, goals should be applied with assignment. It is proposed that goal attainment should be applied with the executive function decentralized down to the operators of the organization, to support parallel processing in problem-solving. Also, further research should be made on the relations between generative learning management and creative climate questionnaire, since both models pertain to creativity in organizations.

Keywords: Generative learning management, leadership style, goal-setting, decentralization, creativity

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This thesis emerged from a variety of experiences I have had, including my role as a coach and the time I spent studying psycho-physiology and social psychology.

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During this period I met two people who became crucial for my thesis. Mats Hedblom, at that time CEO at Haglöfs international, hired me as a consultant to be his speaking-partner for issues concerning his role as a leader. This meant I had the opportunity to apply my model on a real organizational setting. We are still friends and our cooperation continues. The other person was Dr Göran Ekvall, the founder of CCQ (of good repute among those who research on creativity). Göran used to invite me to his home, and for hours we then discussed matters concerning creativity. Göran supported my efforts and introduced me to some his colleagues in the US. He was also the one who suggested that I moved to Lund University to finish the last part of the thesis within psychology.

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Sofie, not only already a PhD in the neighboring field of ethology, but even more important - my fiancée, has been patient, waiting for me to catch up.

I dedicate this thesis to my two sons Viktor and Felix (and their possible siblings to come) and my dad who passed away just before this thesis was sent for printing. They have been my greatest inspiration during this process, even though we have not been allowed to meet for a while.

List of studies

Österberg, P. (2004). Generative learning management: a hypothetical model. *The Learning Organization*, *11*, 145-157.

Österberg, P. The influence of the generative learning management style on interpersonal creativity: a study in a production company (Manuscript). Submitted.

Österberg P. & Nilsson, J. (2009). Members' perception of their participation in the governance of cooperatives: The key to trust and commitment in agricultural cooperatives. *Agribusiness, 25*, 181–197.

Österberg, P. On the relation between Generative Learning Management and the Creative Climate Questionnaire (manuscript). Submitted.

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Introduction

A main purpose of the present thesis was to develop a model of leadership style, Generative learning management (GLM), thought to influence goal-oriented interpersonal creativity in organizations. The next purpose was to develop an instrument to test this model within an organization. Also included in the thesis is a study of participative decision-making, an important antecedent model to Generative learning management that was used to contrast the roles in different types of organizations. Finally, the relation between a model of the creative climate (Ekvall, 1996) and Generative learning management was investigated. An interdisciplinary perspective (Hennessy & Amabile, 2010) was applied to establish an understanding about how leaders should act to influence peoples organizational creativity. This is congruent with Dunnette (1991), who stated that "advances in industrial and organizational psychology must come from both scientists and practitioners and, in particular, from those who successfully blend both science and practice" (p. 2).

In Paper I, the dual-role in the Generative learning management model was constructed based on three antecedent theories: participative decision making - autocracy versus democracy (PDM) (Erez, 1986; Kanfer, 1991), goal-setting theory (Locke & Latham, 1990), and the approach of parallel distributed processes presented by McClelland and Rumelhart (1985), in this model applied to an organization of people.

The GLM dual-role model suggests that leaders who apply a combination of roles – commanding with regard to goal setting and facilitating with regard to parallel knowledge exchange between people in goal attainment – will improve organizational effectiveness when problems and tasks are complex, that is, when creativity or generative learning is required. Assignment (being commanding) and facilitation are poles on the same participative decision-making continuum; assigning goals means taking on the role of the autocrat, and facilitating independence means taking on the role of a supporter of democracy (Durham Knight & Locke, 1997). Goal attainment is suggested to work best when applied with the executive function decentralized down to the operators of the organization, to support parallel processing in problem-solving.

In Paper II, the relation between the GLM model and inter-personal creativity was tested. For the dependent variable, inter-personal creativity – an intersectional concept concerning the generation of knowledge for problem-solving, based on generative learning and creativity – was constructed (Finke, Ward & Smith, 1992; Hinchcliffe, 1999; Nonaka, 1994; Maier, Prange & Rosenstiel, 2001; Wallas, 1926). The result indicated that leaders should apply the suggested combination of roles: assign goals to the organization prior to the application of any strategies, and facilitate independence through parallel knowledge exchange among people in the organization in goal assignment, especially when tasks and problems are complex. The result also suggested a relation between generative learning management and people's belief in their own ability, for example to attain a goal, that is, their perception of task specific competence or self-efficacy (Bandura, 1977; Maddux, 1993) – an important variable in mediating the goal-performance relation (Locke & Latham, 2002).

In Paper III, the influence of participative decision-making (PDM) was tested in a member-oriented organization (a Swedish farmers cooperative). It was hypothesized that, in member-oriented organizations, people demand participation in decisions regarding things associated with goals (governance of an enterprise, for example) (Erez, 1986). In the current study, farmers' perceptions of their commitment to the organizational ideology and trust in the board of directors of the cooperative were tested against three common variables in the cooperative theory: members' satisfaction with the profitability of their farm operations, age of the member, and members' experience from board work. After adding a covariate, most of the variance in the model was explained by perception of participation in the governance of the cooperative.

In paper IV, the relation between the Creative climate questionnaire (Ekvall, 1996) and GLM was tested since both pertain to creativity in the organization. It was thus plausible that there should be a relation between the two instruments. This was not confirmed.

In conclusion, the results from paper II supported the suggestions of the dual role model from the first paper. Moreover, paper III provided a result consistent with Erez (1986), that is, when the socio-cultural set-up of the organization is member-oriented (in this case a farmers' cooperative), leaders should use participation rather than assignment on decisions associated with goal setting. Erez' (ibid.) study also showed that goal setting by assignment was appropriate when the organization was not member-oriented. So in reverse, the result given here indicates support for the idea that different socio-cultural set-ups demand different approaches for goal application; if the culture of the organization is not member-oriented, the application of decisions concerning, for example, goals could be applied with assignment (this is congruent with the GLM model). Paper IV for the most part failed to find significant relations between the CCQ and the GLM.

Goal-setting is not a new occurrence. The ability to use goal-setting has developed through evolution; it early became important for humans to interact to solve complex problems, and in order to do so, the ability to mentally host similar conceptions about what should be attained became crucial. This means that the human brain developed the ability to store and process concrete semantic information about things which later could be retrieved and used. For example, when working together to build a lodge (Terra Amata in Nice, in south of France 380 000 years ago), the attention was set on a goal, and procedures to attain that goal were implicitly directed and applied (Gärdenfors, 2005).

Goal setting theory is common in sports as well as in organizational and industrial psychology for the same reason (Kremer & Scully, 1994; Borman, 1991), and its application, as it seems, is dependent on the socio-cultural set-up (Erez, 1986). Goal setting drives motivation, causes problems to occur and explains performance – effectiveness - in a linear fashion (Locke & Latham, 2002). It is also suggested that goals can be used as an intervention to improve idea generation (Litchfield, 2008). On the other hand, the variant of connectionist theory called parallel distributed processing used in the GLM dual role-model is not commonly used in the field of organizational and industrial psychology, or organizational development, to explain the occurrence of

organizational creativity (or generative learning, see below heading Organizational learning), although it has been suggested that such an approach be applied to issues concerning learning within organizations (DeFillippi & Ornstein, 2003; Lord & Maher, 1991).

A brief background of human socio-cultural development, individual and organizational creativity, goal setting and the emergence of problems, as well as leadership and management, will be presented here. Summaries of the underlying papers (I-IV) will be presented and followed by conclusions in the discussion.

The origin of the human biological prime for creativity and the emergence of hierarchies

When our ancestors left rift Valley in Ethiopia for approximately four million years ago (Ward, 2002), they were most probably forced to use creativity to survive.

Human, that is Homo sapiens, history as we know it goes back approximately 200,000 years, and during most of this period, life evolved around hunting and gathering, with roles discriminated between men and women based on biological set up. Approximately eleven thousand years ago, a climatic change opened a window of opportunity for the human race who due to its predisposition for adaptation and creativity based on evolution, settled down and developed agriculture and complex societies. Within 5,000 years this transformation spread from the land stretching from Palestine and lower Mesopotamia to the northeast corner of India and Britain in the west. This is a testimony to humans' inborn openness to change, cognitive flexibility, and also their sensitivity to social impact (Cacciopo & Berntson, 1992; Cacciopo, Vicker & Pickett, 2006). In new complex societies, such as those of Sumer or Egypt, written language was invented and gave us the opportunity to transfer what we hear of something concrete (paper, papyrus, etc.). This occasionally made it possible to build an accounting system for trade and logistic operations. These new operations demanded technology, financial strength, and mental effort among other things, and some sort of social structure like an organized society was required. But societies and the organizations within them developed into large hierarchies. This meant putting one person at the top to rule, and having middle managers to execute the ruler's decisions. To demonstrate the ruler's divinity, and to sustain people's compliance with this authority, King Aha in Egypt, ruler in the 30th century B.C., was among the first of many kings known today to be buried on a grand scale, taking with him a considerable number of subordinates to promote himself as being on top of everyone else. Similar burial rituals emerged in China and Mesopotamia some hundred years later and as late as the 16th century A.D. in Michoacán in western Mexico (Cook, 2003).

Some 6 800 years after the introduction of Holocene, another step in human culture took place, Abraham migrated from Sumer (in Mesopotamia), a movement that later developed into the three predominant monotheistic religions (Judaism, Christianity, and Islam). The key message of these religions was that humans had to abandon the belief that many different phenomena cooperate to explain everyday events, and to adopt a conception that one force was the cause of everything; things should not be explained from within or with a distributed perspective, but from the outside and above; learning and creativity were treated as something wrong. This is exemplified by the metaphoric account of Adam and Eve being driven from paradise

after having been persuaded to eat the forbidden fruit representing knowledge (Jacobsen, 1976).

Almost 5 000 years after the burial of King Aha, the industrial revolution began in Europe. Probably as a consequence of industrialism, Communism – an ideology that has proven to be one of the greatest obstacles to creativity and entrepreneurship – emerged through the Manifesto written mainly by Karl Marx in the mid-19th century. In practice, this ideology turned out to represent closed societies in which leaders took the role of dictators in order to control every aspect of human action in their society. Deportation of intellectuals and opponents to the Gulag were as common as the random killing of subordinates to demonstrate the contrast between rulers and subordinates, particularly in the former Soviet Union (Skott, 2001).

Due to the industrial revolution, another level of complexity emerged that had not been encountered earlier; in the factory system, many people were assembled in the same production plant, and questions about how to manage large cohorts of people to sustain productivity had to be resolved. After thousands of years of practicing subordination to masters, the refinement of the application of hierarchies was close at hand. Management and efficiency became central themes in the young science of organization and management. Fredrick Taylor (1856-1915), one of the pioneers in this field, applied incentive systems to reinforce peoples' work performance. Administrative and bureaucratic principles for organizational design emphasized rational thinking in a top-down perspective; top managers should do all the thinking, while workers were supposed to comply with given orders about strategy (Daft, 2006). Bureaucracy is now considered an inhibitor of creativity (Soriano de Alencar, 2012). Hierarchical systems remained as the primary source of organization design until the 1980ies, although the shift toward an enterprise culture resurrected during the 1970ies, including traits such as initiative, risk-taking, flexibility, creativity, independence, leadership, strong work ethic, daring spirit, and responsibility (Burns, 2007; Carr & Beaver, 2002).

Creative process and outcome

In ancient Greece, in a time when science was defined by the arts and religion, the emergence of new knowledge was considered divine; emergent structures were thought to emanate from a force from above – 'the one' – and understood to be controlled by something outside the person (Sternberg & Lubart, 1999). This hierarchical perspective is similar to the approach humans developed during the middle of Holocene with regard to unknown phenomena. The interesting thing about this approach is that people's conception of the effect of illumination (their perceptions of emergence) was attributed to external factors.

Johnson-Laird (1996) argues that the French mathematician Jacques Hadamard (1865-1963) was one of the first to comprehend that creative outcomes were caused by implicit mental processes; he considered intra-personal creativity to be explained by unconscious parallel mental processes and mental imagery. According to Johnson-Laird (ibid.), Hadamard was inspired by Einstein, Poincaré, as well as by Wallas' (1926) four stage model of creativity, which contains preparation, incubation, illumination, and verification. With this conception, focus was put on incubation, a black-box phenomenon that operates in the background of the human mind to create

suitable solutions to the problem. The process was suggested to be triggered when attention was shifted away from the actual problem to another task. Later on, illumination was expected; ideas were supposed to emerge, that is, "pop up" into consciousness, possibly, but not certainly, contributing to the resolution of the problem at hand.

Guilford (1950) argued that creativity is general to humans and an instance of learning, because its application results in a change in behavior. He discriminated creativity from traditional learning, referring to branches and governments that complain about helplessness among scientific and technical personnel, who could improve their performance on assigned tasks using techniques they had already learned, but who failed on problem-solving when new solutions were required. Guilford referred to Terman and Oden (1947), who followed children with exceptionally high IQs to study various aspects of intelligence, from childhood to adulthood. They first applied the Stanford-Binet scale, but when these children grew up, the researchers also tested for creativity by applying a verbal intelligence test called Concept Mastery test (CMT), which correlated with the Stanford-Binet test (Terman, 1956). The CMT was based on a synonym-antonym test (Otis, 1916) and another analogies scale (no reference given). Terman and Oden argued that intelligence could be determined by the number and variety of concepts at a person's command, and the ability to see relationships between them. Creativity, on the other hand, they argued, is the ability to make new mental constructs out of one's repertoire of informational and conceptual raw material. The results concerning the relation between intelligence and creativity, as Guilford put it, were not decisive.

Hovecar (1980) examined the relation between ideational fluency and CMT, and his rationale for using ideation fluency but not originality (which is commonly included in the definition of creative outputs) was that fluency was included in many other tests of creative thinking, and logically unrelated to intelligence. The result of the study rejected any relation between intelligence and ideational fluency. In yet another study with a similar ambition, Welsh (1966) studied the relation between intelligence and creativity, using CMT and a version of the Welsh Figure Preference Test called the Revised Art Scale. He also assigned D-48, a non-verbal test composed of two types of test problems using a series of dominoes. The test has proven to be reliable and unaffected by ethnicity or gender, but can to some extent be explained by socio-economic status (Domino & Morales, 2000). Test outcomes also seem to be related to area of study, for example, engineers typically score high on D-48, whereas philosophers tend not to (Gough & Domino, 1963). Neither of the intelligence tests turned out to be related to creativity.

The results of these studies indicate that there are variations in knowledge creation and learning that are similar to the adaptive-generative learning continuum often referred to in the organizational learning paradigm (Hinchcliffe, 1999; Senge, 1990). In this paradigm, adaptive learning – coping within the frame – seems to be consistent with aspects of general intelligence; one can perform with mastery without adding anything new to the process. Adaptive learning is discriminated from generative learning, which is the creation of thoughts and mental constructs outside the subject's mental frame of reference (Senge, 1990). This is consistent with Terman and Oden's conception of creativity (see above), as well as with Finke, Ward and Smith's

(1992) proposal that creative cognition is an emergent process, that is, the production of new combinations based on previous concepts of knowledge. According to Baughman and Mumford (1995), the combination and reorganization of present knowledge provide a mechanism for generating new ideas, that is, emergence (Finke, 1996). For example it can be applied by superimposing two images (Rothenberg, 1986).

During the second half of the 20th century, models were developed to assess and facilitate creativity, based on the conviction that all people have a creative ability (Guildford, 1950). Brainstorming (Osborn, 1957) was suggested as an intervention similar to goal setting to improve idea generation for creative problem-solving (CPS) (Litchfield, 2008). There are four rules or assignments for brainstorming: (1) to generate as many ideas as possible, (2) to avoid criticizing any of the ideas, that is, to defer judgment (3) to attempt to combine and improve on previously articulated ideas, and (4) to encourage the generation of "wild" ideas. However, in studies comparing group versus individual brainstorming, the effect of group was rejected (Dunnette, Campbell & Jaastad, 1963; Taylor, Berry & Block, 1958). In both studies, people who had previously worked together were assigned to the groups, which, according to the authors, is equivalent to a real life situation. The explanation was that the group situation causes production blocks because only one person at a time is able to give suggestions, which was argued to interfere with individuals' mental "production train" of thoughts (Kerr & Tindale, 2004). This means that, even though you might have a great idea, your presentation of the idea is blocked by someone else's presentation, which is assumed to cause inhibition of the mental activities associated with creative processing. These authors suggest that attention should be paid to social cognition in order to understand the complexities of groups as problem-solving units (Larson & Christianity, 1993; Cacioppo & Berntson, 1992). But although there seems to be doubt about the effect of group facilitation on ideational fluency, several versions of the original concept have evolved over the years, and it is commonly used in organizations even today (Isaksen & Treffinger, 2004).

According to Simonton (1999), a creative idea or product must be original with respect to a specific socio-cultural group. He exemplifies this with Galileo's discovery of sunspots. Even though the Chinese had noted their existence for well over a thousand years, it was considered an original contribution to European civilization.

"Clearly, an original idea or product is judged as adaptive not by the originator but rather by the recipient. Accordingly, we have another reason for maintaining that creativity entails an interpersonal or socio-cultural evaluation. Not only must others decide whether something seems original, but they are also the ultimate judges of whether that something appears workable." (Simonton, p. 6).

Within the frameworks of creative cognition, Finke, Ward and Smith (1992) suggested the Geneplore model for intentional creativity, which contains two phases of processing: a generative phase with representations of preinventive structures and an explorative phase in which the preinventive constructs are used to form emergent structures. Contrary to Creative Problem Solving, which focuses on group processes, this approach aims at understanding creativity from an intrapersonal perspective, focusing on the production of new mental constructs. Finke (1996) argued that the

Geneplore model "*can use mental imagery to retrieve various features and incidental details that are not intentionally committed to memory*" (p. 382). Seger (1994) proposed that memories that are formed incidentally contain non-episodic, complex information that has been projected into the memory system without awareness through implicit learning. This suggests that it is difficult to control processes involved in forming new constructs of knowledge, independent of whether they have an adaptive or a generative orientation. In studies of emergence, originality emerged from categories that were unrelated to one another (Mobley, Doares & Mumford, 1992; Wilkenfeld & Ward, 2001).

Creativity is a complex construct consisting of both novelty (originality) and usefulness. It can refer to the performance, potential, product, or problem-solving (Runco, 2008). It is a general mental ability that is determined by the interplay between different regions (handling both declarative and non-declarative cognitions) in a normally functioning human brain (Damasio, 2005; Fenker & Schültze, 2009; Flaherty, 2004). Within these regions, problem-solving is a matter of automaticized processing, directed by attention; there is a bidirectional influence between processing, based on parallel distribution, and attention. Parallel distributed processing means that units in a system interact by being organized into groups (modules) and interconnected in overlapping chains (pathways) of modules. Processing is based on propagation of activation among the units, which means that a search for interconnecting units is performed in a very broad sense (Cohen, Servan-Schreiber & MCcClelland, 1992).

Based on the above, it is possible to conclude that creativity is a novel and original output, based on individual or social cognitive processing in accordance with a connectionist approach.

The emergence of knowledge within the organization

The purpose of an organization is to attain a common goal (Campbell, 1991; Jacobsen & Thorsvik, 2002; Martin, 2001), but according to Isaksen (2007), leaders and organizations are facing an ever-increasing challenge to deal with escalating complexity. Business success seems to be dependent on creativity and the way creativity is managed (Amabile & Kharie, 2008). Organizations should have an orientation toward vitality and change in order to handle, or manage, the complexity within the organization (Baker & Sinkula, 1994; Senge, 1990). These two factors are fundamental to complex problem-solving, and as a consequence, also to aspects of the emergence of knowledge.

A vivid and famous example of goal intervention to stimulate knowledge creation is the rescue of the American crew onboard the returning Apollo 13 shuttle in 1970ies. The management at NASA assigned a team to invent a filter to clean the air in the shuttle in order to prevent the crew from being intoxicated by carbon-dioxide. This goal was addressed after one or two of the oxygen tanks had exploded leaving the crew with the prospect of certain death. This is by definition a complex situation, and can be used as a schoolbook example of how to solve other complex tasks. As the story goes, a group was assigned to invent this artifact – the carbon-dioxide filter – by combining things that were to be found on the shuttle. Objects that were previously perceived to be unrelated were used as preinventive structures to form an emergent structure – the carbon dioxide filter. This is in accordance with the creative cognition

approach proposed by Finke, Ward and Smith (1992), suggestions about unrelated objects (Mobley, Doares & Mumford, ibid.; Wilkenfeld & Ward, ibid.), as well as with assigned goal setting as an intervention to ignite the motivation to solve complex problems (Litchfield, ibid.).

After the goal was assigned, the problem-solving team was left alone, which means that the NASA management assigned another important aspect of inter-personal creativity: independence to attain the goal through decentralization, which is consistent with the suggestion about the bidirectional relation between attention and process in the framework of parallel distributed processes used in the present thesis (Cohen et al., 1992). Eventually, as most people know, the filter was developed within the time-frame, and the crew could return safely to Earth. Even though this is an example of problems that seldom occur, the format is applicable to any kind of complex problem, that is, any product, service or administrative routine in sawmills, pharmaceutical production plants, research and development departments as well as kindergarten schools, universities, farmers cooperatives and so on.

Understanding the antecedent processes of a creative outcome – i.e. an idea that is original with respect to a particular socio-cultural group (Simonton, 1999) – on an individual level will help in understanding emergence based on concept combinations on an organizational level. This means that our understanding of knowledge creation within an organization of people could be based on the principles of knowledge acquisition on the individual level, either as perceptions projected into the network of nerve cells in the human brain, or as concept combinations within this network, which eventually will result in the emergence of new ideas (Costello & Keane, 2000; Finke et al., 1992). Such an approach has been applied in the neighboring fields of organizational learning as well as in organizational creativity.

Organizational learning

In the field of organizational development, organizational learning is a framework that aims at understanding how continuous learning processes, preferably generative ones, can be set in motion in the learning organization (Tsang, 1997). Major contributions to the field have been made by Nonaka (1994) and Senge (1990), both of whom suggest models for knowledge creation. In Nonaka's model, a two-by-two matrix is suggested to describe four possible interactional outcomes between explicit knowledge (things you can verbalize or write down) and implicit knowledge (things that are manifested in gestures and underlying meanings revealed in the interactions between people). Senge (1990), on the other hand, discriminates between adaptive learning (coping within the frame of reference) and generative learning (creating from outside that frame) using a systemic approach – where several aspects work together to form the outcome.

Stacey (2007) reviewed and compared the different ways in which organizations change and suggested that several concepts constitute the premises for organizational learning, for example systems thinking and cognitive psychology. According to Lipshitz, Friedman and Popper (2007), the field has developed into a multitude of suggestions pointing in different directions and using a broad array of terminology, such as knowledge creation, systems thinking, mental models, organizational memory and so forth; this marks a detour away from its roots, which are the detection and correction of errors. They demystified the concept by arguing that organizations learn

through human interaction, that is, people exchanging knowledge between one another. Maier et al. (2001) argued that the term organizational learning stems from an analogy: "that a goal-oriented social structure, such as an organization, is able to learn like an organism" (p. 14).

Although not every suggestion made in the field of organizational learning is equal to the theories developed in the field of organizational creativity, there are more similarities than differences, and it would be wrong not to take them into account.

Organizational creativity

According to Shalley and Zhou (2008), there are two main frameworks that have guided the work of organizational creativity. The first is Amabile's (1988, 1996) model, which suggests that expertise or factual knowledge about a given area, explicit or implicit knowledge about strategies to produce creative ideas, and finally, individuals' attitudes toward a task – the perception of their own motivation to work on the task – are the foundation of organizational creativity. The other framework is proposed by Woodman, Sawyer and Griffin (1993), and stresses that creative performance is predicted by the interaction between individuals' disposition and work context. The authors proposed that creative performance is a function of, or interaction between, individual (cognitive ability), group (e.g. norms and cohesiveness), and organizational (e.g. culture and reward systems) characteristics. In this latter model, transformation to enhance creativity is the key. The main empirical results suggest that a supportive and stimulating work environment is of great value in promoting creativity within the organization, whereas a non-supportive and controlling leadership style is not (Shalley & Shou, ibid.).

This is consistent with the rationale behind Ekvall's (1996) development of a 10-dimensional model operationalized in the Creative Climate Questionnaire (CCQ). The purpose of the CCQ is to assess organizational work climate – the recurrent patterns of behavior, attitudes and feelings that characterize life in the organization – as an intervening variable to the relation between leaders and organization performance (Ekvall, 1996; Isaksen & Ekvall, 2006). An important note is that similar instruments have been developed by Amabile, Conti, Coon, Lazenby & Herron (KEYS; 1996), and Anderson & West (TCI;1996). The climate characters in Ekvall's model all refer to factors that influence implicit and emotional processes within the individual; for instance, if you feel comfortable enough to express your own opinion in discussions with colleagues, it is easier to think outside the box. Ensuring such a climate is the job of the leader. In a study comparing the effect of leadership style versus work climate on creative outcomes, Ekvall and Ryhammar (1998) demonstrated that work climate mediates the effect of leadership on the organization outcome.

The neural network analogy

For a creative outcome to emerge, individuals' dispositions and the characteristics of the organization seem to be intimately interconnected. Some attempts have been made to use cognitive theory to explain organizational behavior. In organization science, analogies to procedural memory systems have been applied in an attempt to explain learning processes (generative and adaptive learning). Cohen and Bacdayan (1994) used analogies to the implicit characters of procedural memory in an attempt to

understand the properties and dynamics of how people's behavior routines arise and change within the organization. This approach helps in understanding how experience, i.e., knowledge, can be rapidly transferred to an appropriate situation. This means that when a problem occurs, people with the proper experience will be assigned by the distributed connections of their co-workers to take part in the task of solving the problem.

In organizational psychology, neurobiology and connectionist theory have been used with a similar purpose: to describe architectures of knowledge exchange for problem-solving within the organization (Lord & Maher, 1991). According to this approach, complex problems are best solved when the executive function for knowledge creation and development of new strategies are decentralized to the operational level, i.e., when the multiple interconnecting activities within the organization are pursued by independent persons in ways associated with the framework of parallel distributed processes suggested by the cognitive neuroscience (Lord & Maher., ibid.; McClelland & Rumelhart, 1985; Perry-Smith, 2008). Read, Vanham and Miller (1997) argued that, in such interactive feedback systems, knowledge is represented by interaction between many instances rather than by a single instance. Since knowledge is distributed to many instances (persons), the organization is not dependent on any single instance.

The conclusion based on this reasoning is that creative ability or potential within an organization is manifested through inter-personal, or social, cognitive exchange processes in analogy to the PDP framework, which can be triggered by the intervention of a challenging goal.

Organizational goal setting, the emergence of problems, and the application of goal attainment

Leadership is often defined as a process whereby an individual influences a group of people to attain a common goal (Northouse, 2007). Goal setting has proven to be a reliable way of stimulating people's motivation, which, if activated increase the probability for goal attainment. A goal is suggested to affect performance in at least three ways: directing attention and effort, as well as prolonging persistence to solve a task. Further, the goal-performance relation is said to be linear (Locke et al., 1981; Locke & Latham, 2002). Daft (2006) argued that the understanding of organizational goals and the way one goes about attaining them is the first step in understanding organizational effectiveness – the degree to which an organization realizes its goals. So what are the consequences of goal setting?

A goal – assigned or applied by participative decision-making – causes a problem to occur. Technically, a problem represents the difference between a current state and a goal state (Gilhooly, 1988). Guilford (1956) described this as comprehensions about a situation in which "something needs to be done about it" (p. 273). However, people typically think that a problem is something one should avoid (Treffinger, Selby & Isaksen, 2008).

Problems can be either simple (familiar) or complex (unfamiliar). If problems are familiar, adaptive learning, which means using established strategies and knowledge, will be applied to solve them. When problems are complex, that is, when nobody

currently has a conception of how to develop proper strategies for resolving them, the creation and application of new knowledge and strategies will be asked for (Duncker, 1945; Wood & Locke, 1990). Strategy means the way in which someone goes about attaining a goal (Durham et al., 1997), that is, a product of suggestions about how to combine current knowledge into new concepts in order to create a solution to the problem. Guilford's (1956) proposal about production factors is consistent with this reasoning; he suggested that divergent thinking is a process used to produce an abundance of ideas that can be categorized and evaluated, then some of them could be implemented as a solution to the problem. The opposite, convergent thinking, which means focusing on one solution associated with the given question, is applicable in simple problem-solving. Understanding the relation between goal, problem space, and the process of goal attainment is fundamental for leaders who wish to support creative thinking within their organizations. The tentative conclusion, based on this reasoning and suggested in this thesis, is that goal setting can be applied as an intervention to the parallel distributed inter-personal exchange processes.

Assignment or participation in decisions about goals

Sashkin (1984) concluded that participation in decisions is not merely effective but an ethical imperative for managers. He suggested a practical approach, proposing four broad areas of participation: goal setting, making decisions (choosing from alternative courses of action), problem-solving (including the generation of alternative courses of action as well as choosing among these actions), and finally making changes in the organization, that is, organizational development. All of these areas are overlapping according to Sashkin's account; change, like in organizational development, is likely to include problem-solving, as well as decision-making and goal-setting activities. He suggested that even though statistical evidence is lacking, an abundance of action research points to the effectiveness of organizational learning through participative management. Among other things, he reported an approximate 40 % increase in productivity, based solely on re-organizing the assembly lines into self-regulated work teams. Sashkin emphasized that participative management is a complex, and in order to get it right, some contingency factors must be taken into account: psychological (values, attitudes, and expectations of organizational members), organizational (work design, culture, and climate), and environmental (change in technology, governmental relations, and competition). Taken together, these contingencies form a complex that determines whether or not participation should be applied; the complex is manifested in employees' willingness to participate (psychological), if the work climate enables people to trust one another (organizational), or when technology changes are applied.

Locke, Schweiger and Latham (1986) argued that participation in decision-making is not an imperative, but a managerial technique that is appropriate in certain situations. Locke et al. distinguished between participation in decision-making and authoritative decision-making. When reviewing 50 studies about effects on productivity, there was no clear effect of participative decision-making compared to authoritarian decision-making. Their conclusion regarding participative decision making is that the effect is cognitive rather than motivational, and that participation may improve productivity, but does not consistently have this effect; in some cases authoritative decision-making is preferable. They also concluded that the motivation to

reach goals can be achieved by assigning goals as well as by setting them through participation; the combination of assignment of goals and support in attaining them seems to be functional for performance.

Factors that influence the choice between authoritarian or participative decision-making are skill or expertise on a subject and following specific situational rules. Another suggested aspect is experience, task-relevant maturity, which is more like a transfer model concerning when responsibility is moved from the manager to the employee alone. Locke et al. emphasized that people need to feel that their job is important, and that this is achieved by giving them challenging goals. Even so, many employees want autonomy in goal attainment, that is, in problem-solving; they wish to use their personal judgment. Their overall conclusion was that participation in decision-making is sometimes useful and sometimes not.

Erez (1986) showed that socio-culture plays an important role in the choice of when to use or not use participation. Her study demonstrated that in the private sector, where people are hired for the job, the performance effect was strongest when goals were assigned. On the other hand, when people were assigned to the organization in a member-oriented way, goal setting by participation gave the best effect on performance.

A conclusion based on these three studies is that decision-making concerns many different aspects of human interaction and that socio-cultural factors play a role in decisions concerning goal setting. Goal attainment, on the other hand, seems to work best when decentralized, which may be manifested in participation or individual decision-making to solve problems.

Facilitating inter-personal creativity in organizations: leadership and management in the creative context

Managing or leading creativity calls for choice of leadership style, which by itself is a broad topic involving many approaches to the role, or roles, of the leader. There is an ongoing debate about the differences between leadership and management, because not all “managers” have subordinates: the computer department for example. However, management typically involves the role of sustaining stability and efficiency, whereas the leadership role is said to promote flexibility, innovation and adaptation to change. Further, management is considered to be the role of supervising and administrating resources, projects, and deadlines (following already made plans and controlling processes), whereas leadership is the role of “thinking the big picture”, being visionary in developing super ordinate goals to stimulate people’s motivation and to facilitate their self-efficacy in applying their creative ability in their struggle to attain the goals. Managers are often depicted as being transactional in their behavior, whereas leaders are said to have a more transformational style associated with facilitating organizations’ adaptation to change that is, encouraging people to acquire new knowledge. Also common in many definitions of leadership are features such as intentional influence or directing by assigning goals (Bloise et al., 2007; Yukl, 2006).

A thematic analysis performed by Rickards and Moger (2006) revealed nine different overlapping approaches concerning the relation between leadership and creativity and innovative productivity in a group or organizational setting. Among these approaches, creative problem-solving has been a recurrent theme throughout the years, focusing on the role of facilitating people's creative efforts. For example, Ekvall and Arvonen (1991) added a third dimension, change-centered leadership, to the two-dimensional employee –structure dimensions originally developed by the departments of Social Research at University of Michigan and Ohio State University. Besides qualities such as being employee- or task-oriented, Ekvall and Arvonen's change-centered dimension depicted leaders who create visions, are open to new ideas, encourage cooperation among members of an organization, and who are not fixated on following already established plans. This approach is consistent with the broader concept of transformational leadership which has proved to influence creativity on individual as well as on organizational level. (Gumusluoglu & Islev, 2009).

In transformational leadership, the focus is shifted from rational processes to human emotion and values; this approach helps in understanding the process of how leaders influence people to commit to difficult goals; it includes things like individual consideration, intellectual stimulation, idealized influence, and inspirational motivation (Yukl, 1999). Gong, Huang and Farh (2009) found that transformational leadership has an indirect relation to creativity among people in an organization. It is important to note that the study was conducted in Taiwan, where the socio-cultural structure is different from that in Western nations. They used Dvir, Eden, Avolio and Shamir's (2002) definition of transformational leadership: "broadening and elevating followers' goals and providing them with confidence to perform beyond the expectations specified in the implicit or explicit exchange agreement" (p. 765). The result emerged through a field study, as experimental studies had not been able to reveal any relation between transformation leadership style, learning orientation, and creative output. The conclusion of the study was that employees' creative self-efficacy predicts employee creativity to a greater extent than the direct effect of transformational leaders, suggesting that self-efficacy serves as a mediator between transformational leadership style and employee creativity. The result also revealed a strong relation between employee creativity and job performance within a corporation. The conclusions from the study are in line with other research on the leadership – learning orientation/self-efficacy – creative output/job performance chain (Baker & Sinkula, 1994; Bandura, 1977; Ryhammar & Ekvall, 1998; Locke & Latham, 2002). In a similar way, Senge (1990) proposed that leaders should cultivate people's innate ability and motivation to learn new things by using visionary statements to establish problem spaces that cause creative tension to occur within the organization.

Study 1 – generative learning management: a hypothetical model

Adaptation to change and learning-based initiatives within organizations have long been associated with leadership style. In this paper, a dual-role model for leadership was constructed aimed at influencing what was called Market-based generative learning within an organization. Market-based meant focusing people's attention on a

goal associated with the company's business vision. Generative learning meant creating new knowledge to solve emerging complex problems. The dual-role model was called "Generative learning management."

A discursive approach was applied to extract and analyze the key concepts assumed to be important in the model. For example, the analogy "a goal-oriented social structure, like an organization, is able to learn like an organism" (p. 14) (Maier et al., 2001) constituted the starting point for the model. Participative decision-making (Erez, 1986; Kanfer, 1991) emphasized the choice between assignment and participation in decision-making, especially goal setting, which was applied as an intervention to stimulate creativity by directing people's attention, effort, increasing persistence, and to drive motivation (Litchfield, 2008; Locke & Latham, 2002).

Goal attainment – the process of application of strategies with the prospect of solving complex problems – was applied as a self-organizing tool, where inter-personal exchange of knowledge within the organization established a solution that could be applied to solve the problem at hand; the conclusion resulted in an analogy to connectionism in the brain. In this framework, the application of strategies to attain a goal was carried out in a parallel distributed fashion (Lord & Maher, 1991; McClelland & Rumelhart, 1985).

The conclusion for generative learning management based on goal-setting theory, the framework of parallel distributed processes, and participative decision-making was that in order to influence creativity in the organization, leaders should play two roles: commanding in relation to goal setting and facilitating in relation to goal attainment.

Comment

Goal setting can either be applied prior to the initiation of the creative process (e.g., producing a carbon dioxide filter for the Apollo 13 shuttle, see introduction) or added to an ongoing creative process (the work climate is already set for creative thinking). In the first case, the goal will frame a problem and if this problem is unfamiliar (complex), new knowledge must be acquired to solve it, which calls for generative learning/creativity. In the second case, an exploratory creative process is ongoing and goal setting works to guide attention and effort in a specific direction post hoc.

Study 2 – dual-role leadership style and inter-personal creativity in organizations

The conclusion in Paper I was that leaders need two qualities to enhance market-based generative learning in organizations. In study 2 this concept is formulated as goal-oriented organizational creativity. Moreover, in this paper, the emphasis was on "leadership" rather than "management", due to the fact that even though these concepts are used interchangeably in some literature, the academic connotations of the concepts are differentiated, where management refers to the practice of controlling the work on strategy, and leadership refers to the role of the visionary (Yukl, 2006).

A central assumption in the study was that this dual composition of leadership style is related to an inter-personal exchange process, where people in an organization exchange and create knowledge to develop new strategies in the goal attainment process. The *purpose* of the present study was to test the dimensionality of Generative

Learning Management. The first hypothesis was that GLM contains a two-factor structure, and the second hypothesis was that GLM is related to inter-personal creativity but not intra-personal creativity. Measures like self-efficacy and efficiency were applied to validate the model.

Method

Participants and Procedure

Two hundred and thirty people from seven different departments in a pharmaceutical production company were asked to participate, and 110 persons responded: 48% men (age $M = 44.3$, $SD = 8.85$) and 52% women (age $M = 39.11$, $SD = 9.69$).

The questionnaire was distributed via e-mail to the company. The message described terms of conditions; people were asked to name their closest manager and to assess some leadership qualities related to that person. Total anonymity was promised, and the result was only to be presented in an aggregated form, making it impossible for the respondents to be identified.

Measures

Generative Learning Management Questionnaire. The questionnaire contained 30 items, derived from the conceptual model of Generative Learning Management to assess leaders' goal-setting and connectionist ability (Österberg, 2004).

The ability to assign Goals. Five of the items in the questionnaire were related to the leader's ability to assign goals to the organization. These items, and three dependent variables (see below), were addressed as single statements on a 7-point Likert scale (1= I do not agree, 7=I do agree).

Example statement: "Our leader has stated a concrete, superordinate goal for the organization."

The ability to facilitate independence in goal attainment. A second part of the questionnaire contained 25 items associated with the suggested ability of generative learning managers to facilitate "connectionism" within an organization, in accordance with the suggestions made by McClelland and Rumelhart (1985): decentralization of the executive function and task.

A couple of example statement "One effect of our manager's leadership style is:

a: (left statement) "*that he/she often decides how we should carry out different projects*" and (right statement) "*that we often have the possibility to decide on our own how we should carry out different projects.*"

b: (left statement) "*that people in the organization hesitate to consult each other on matters concerning problem-solving*" and (right statement) "*that people in the organization trust each other for problem-solving matters."*

Items concerning the facilitative role and inter-personal creativity (below) were stated as semantic differentials (Osgood, Suci & Tannerbaum, 1971) using a 7-point scale.

Inter-personal creativity. Five items were used to assess perception of the main criteria – inter-personal creativity within the organization. An example: "*It feels natural for me to transfer my ideas to coworkers and managers.*" Single statements were addressed using a 7-point scale.

Intrapersonal creativity. "I generate many ideas on an everyday basis." A single item was used to assess this ability.

Perception of being efficient. "I am efficient – I work fast and use a small amount of recourses." A single item was used to assess this ability.

Self-efficacy. "I am successful at work."
The concept refers to perceived personal competence (Bandura, 1977; Maddux, 1993).

Data analysis

A principle components analysis (PCA), with varimax rotation (SAWP 17.0), was applied to extract components from the Generative Learning Management scale, and Cronbach's alpha was used to test for internal consistencies among these components and inter-personal creativity. An analysis of normal distribution showed that certain variables were not normally distributed, thus a Spearman rank correlation analysis was applied to test for relations between all factors involved in the study. To test the hypothesis about generative learning management and inter-personal creativity, a multiple linear regressions analysis were applied (enter).

Result

The result supported the hypothesis concerning GLM suggested by Österberg (2004); leaders who combine the role of acting with autocracy in goal setting with the role of facilitating independence in goal attainment by decentralizing the executive function will influence inter-personal creativity in the organization.

Comment

Creativity can be viewed as the process or the outcome of idea generation, and in order to understand the result of this study, I compared the application of generative learning management model with the way brainstorming was initially intended to be applied: as an intervention rather than as a task (Litchfield, 2008). Although not all assumptions for the models are the same, they have some similarities in the way they are supposed to be applied regarding goal setting and goal attainment, that is, idea generation for problem-solving.

The result of the study is indicative even though the PCA validates the model only to some extent.

One reason why goal setting is related to perception of having personal competence (self-efficacy beliefs) is that it is a feed-forward system for self-regulation, as opposed to a negative feedback control system aimed at correcting errors (Bandura & Locke, 2003). A positive belief in one's own competence regulates human functions such as cognition, affect, and motivation and is a mediator between goal and

performance (Bandura, 1977; Locke & Latham, 2002). Thus, self-efficacy is central to the process of attaining goals when problems are complex.

The study further indicated that inter-personal creativity is influenced by an equal combination of assigning goals, that is, authoritative decision-making, and independence in goal attainment, that is, the process of creating knowledge and strategies to achieve the goal.

Study 3 – members' perception of their participation in the governance of cooperatives: the key to trust and commitment in agricultural cooperatives

In the field of cooperative theory, agency and property right theory are claimed to be important to our understanding of why members commit to the cooperative idea and why they trust their board of directors. Many suggestions have been made in an attempt to understand the complexity and conflict of such organizations. Diverse businesses, heterogeneity among members and large geographical operating areas are among the many suggested explanations. The *aim* of the study was to explore the extent to which members' assessment of their cooperatives' degree of success is related to various member attributes, with special reference to the members' perception of their participation in governance of the cooperatives.

Method

Participants and procedure

To examine the importance of participation in the governance of a member-oriented organization, questions were taken for the present study from a questionnaire developed by Hakelius (1996). The number of respondents in the sample was 1170 (52%).

Result

The result revealed that "commitment to the cooperative idea" and "trust in the board of directors" varied with traditional variables used in the cooperative framework: age of the farmer, whether the farmer had any experience of board work, and members' satisfaction with the profitability of their farm operation. When a covariate was added, most of the differences were explained by the members' perception of their participation in governance of the cooperative.

Comment

Being a part of the decision-making process seems to be an important issue for Swedish farmers – not because they are farmers, but because they are members. Membership seems to be a socio-cultural condition that causes people to be motivated to participate (see Sashkin, Locke et al., and Erez above).

Even so, in many studies on Swedish farmer cooperatives, effort has been put into understanding the impact of age, or the return of capital of the farming business itself, from a rational economic point of view. Putting rationality aside and instead emphasizing the matters involved in between being a member and not being a member puts this issue in a different perspective; being a member in any organization seems to drive the motivation to participate.

Study 4 – on the relation between generative learning management and creative climate

There is a rationale to investigate the relation between inter-personal communication in organizations and work climate for creativity, as working together to achieve a common goal as well as being innovative is fundamental to the human species (Gärdenfors, 2005; West, 2005). In a social setting new knowledge and strategies are created when people come together to discuss matters and exchange knowledge with one another. Research on the relation between leadership and organizational creative and productive outcome respectively have demonstrated the mediating role of work climate (Ekvall & Ryhammar, 1998). In a similar way, a recent pilot-study has indicated a positive relation between parallel distributed exchange between people in an organization and organizational creativity (Österberg, manuscript). Organizational climate is discriminated from organizational culture in a similar manner as declarative and non – declarative memory; i.e. one can perceive a work climate but only sense the work culture (shared meanings, values, attitudes, and beliefs; Schein, 1994). This means that if the work environment mediates the relation between leadership behavior and organizational outcome, climate is a more manageable (tangible) variable compared to culture. James and James (1989) investigated "psychological processes linking cognitions of work to affect and, ultimately, to behavior" (p. 740). With reference to Locke (1976, p. 1329), they argued that in organizations people seem to have desires for a) clarity, harmony, and justice, b) challenge, independence, and responsibility, c) work facilitation, support, and recognition. They concluded that these values relate to certain attributes; for example, perceptions that a job or a task is challenging are believed to be positively related to personal welfare and increase in a person's belief in his or her personal competence, i.e., self-efficacy.

Challenge and job satisfaction go hand in hand so to speak, and with job satisfaction, increase of organizational performance is not far-fetched. The *purpose* of this study was to test the relation between Generative learning Management and the Creative Climate; the hypothesis was that there is a positive relation between each of the two antecedent GLM dimensions and each of the ten dimensions of CCQ.

Method

Participants and Procedure

Two hundred and thirty people from seven different departments in a pharmaceutical production company were asked to participate, and 110 persons responded: 48% men (age M = 44.3, SD = 8.85) and 52% women (age M = 39.11, SD = 9.69).

The questionnaire was distributed via e-mail to the company. The message described terms of conditions; people were asked to name their closest manager and to assess leadership qualities related to that person. Total anonymity was promised, and the result was only to be presented in an aggregated form, making it impossible for the respondents to be identified.

Measures

The Generative Learning Management questionnaire (Österberg, 2004) contains two leadership dimensions (the Cronbach alphas' in the present study all exceeded .70):

1. Leader's goal setting ability (5 items). An example statement is: "Our leader has stated a concrete, super ordinate goal for the organization". For the goal setting items, single statements were addressed, using a 7 – point scale; Marking 1 means that the respondent totally disagrees with the statement, and 7 means totally agree.

2. Leader's ability to decentralize decision making about goal attainment (12 items). Alpha value was .89. A couple of example statements are "One effect of our manager's leadership style is:

a: (left statement) "*that he/she often decides how we should carry out different projects*" and (right statement) "*that we often have the possibility to decide on our own how we should carry out different projects.*"

b: (left statement) "*that people in the organization hesitate to consult each other on matters concerning problem-solving*" and (right statement) "*that people in the organization trust each other for problem-solving matters."*

The items concerning the leaders' ability to decentralize were stated as semantic differentials (Osgood, Suci & Tannerbaum, 1971) on a 7-point scale.

The Creative climate questionnaire (Ekvall, 1996) uses a 4 –graded scale and contains ten dimensions with five items in each dimension. The dimensions are: Challenge, Freedom, Idea-support, Trust/openness, Dynamism/liveliness, Playfulness/humor, Debates, Conflicts, Risk taking, and Idea-time. Internal consistency has been investigated and alpha has been shown to exceed .7 for all dimensions (Ekvall, 1996). The CCQ has been validated against creativity criteria (Ekvall & Ryhammar, 1998).

Result

The result demonstrated that Generative learning management model and Creative Climate Questionnaire were unrelated to one another with a few exceptions. First, debate (CCQ) and leaders ability to decentralize (GLM) were negatively associated to one another (r_s = -.33*). Also idea time was negatively associated with leaders ability to decentralize (r_s = -.36*).

Comment

The intuitive thought that factors explaining work climate should be related to factors explaining inter-personal exchange process is not far fetch as both constructs has proven to be associated with organizational creativity. Even so, the statistical analysis revealed a different outcome; two of the CCQ - dimensions - idea time and debate – had a negative correlation with the GLM - dimension leaders' ability to decentralize decision making about *goal attainment.* One suggestion was that GLM and CCQ are

based on different settings; the items of CCQ may be directed to situations such as formal meetings, whereas GLM focus on informal meeting. Other important clues that may reveal this issue are the definitions used. Debate in Ekvall's model may be based on the assumption that people have gathered for formal meeting, whereas GLM is conditioned by the principles of parallel distributed processes (Lord & Maher, 1991; McClelland & Rumelhart, 1995), i.e. a metaphor that suggests knowledge exchange between people in a rather informal way.

Idea time was the other dimension that was negatively associated with leaders' ability to decentralize decision making about goal attainment. Ekvall's argumentation that time pressure is negative for idea generation, is in contrast to the GLM-construct as a whole which is based on goal setting theory (Locke & Latham, 2002), where tight deadlines work to improve motivation, hence performance on simple and complex tasks (Wood & Locke, 1990).

Discussion

The results of the thesis support the proposition that leaders should focus on taking on two parallel roles if they are to influence inter-personal creativity in a private organization: the roles of assigning goals and facilitating independence among people in the organization to attain the stated goal, especially when problems are complex, i.e., when people lack the knowledge to solve the problem. It is possible to consider Generative learning management as a process-oriented innovation (Mumford, Hester & Robledo, 2012).

Over time, complex problems emerge in all organizations, which points to the importance of organizational creativity – *the combination of knowledge objects, or fragment of these object, into new concepts*. The supporting evidence for this conclusion is interdisciplinary; contributions come from research about human evolution, neuropsychology and social neuroscience, organizational development, and also from the literature of archeology and anthropology. Therefore, the background for this thesis begins in Rift Valley in Ethiopia, which most probably is the place where human cognition started to develop. I therefore argue that in order to understand the relation between leadership and organizational cognition and behavior such as creativity, it is crucial to grasp some content of human evolution.

When our human ancestors left the forest to explore the savanna, this new environment demanded new kinds of abilities to survive (Ward, 2004). Tool-making became an urgent skill as humans now traveled to new and unknown places; archeological findings support such an argument (Cook, 2003). To compensate for this new situation, evolution provided humans with the ability to store information for later use that could be retrieved if necessary. General memory as well as personal memory with spatial and temporal references was added to the existing procedural memory, as well as the ability to produce new mental representations based of previously held representations. Together, semantic and episodic memory made it possible for humans to imagine things that are not present. Last came the ability to talk; verbal negotiations is a rather new and complex ability, and recent research suggest this ability is the reason why focus sometimes is moved away from an attitude object (Eriksson, 2001; Mercier & Sperber, 2011). This could be exemplified with a formal meeting where people gather to discuss problems, but which is commonly known to cause

phenomenons like production blocks (Kerr & Tindale, 2004). Litchfield (2008) suggest that goal-setting can moderate the effect of production block, which is similar to the suggestions given for generative learning management.

Generative learning management model was an inference from various disciplines. The antecedent theories – participative decision making (PDM), goal setting, and parallel knowledge exchange – have been validated in their own respective fields, which provided support for the models conceptual validity. Goal assignment and decentralization of decision making about strategies to attain a goal, in analogy with parallel knowledge distribution, was framed by the PDM (autocracy-democracy) dimension and are considered pre-inventive structures similar to the Geneplore model (Finke, Ward & Smith, 1992).

Study II aimed at testing the consistency of Generative learning management, i.e., the relation between the GLM and inter-personal creativity. The study was based on the second version of the GLM scale, and even though an earlier version was tested several times, this test was considered a pilot. Two components, leaders' ability to assign goals to the organization, and leaders' ability to decentralize decision making about goal attainment, turned out to be independent of one another. The implication of that is that goal assignment and decentralization each have an impact on inter-personal creativity.

An interesting remark however, is that the GLM style was related to inter-personal but not intra-personal creativity. This implies that GLM style adds something new, compared to established models like Brainstorming; early studies about brainstorming is indifferent to whether people generate ideas on their own or in a formal group setting (Dunnette et al., ibid.; Taylor et al., ibid.). Later studies have suggested that the group setting itself causes production block, because people are forced to communicate in a hierarchical fashion (Kerr & Tindale, ibid.). Recent studies about brainstorming have suggested goal setting to be applied by assignment (Litchfield, ibid.), in a similar way as GLM. A remark should be considered for the dimension "Facilitate independence" on goal attainment. This dimension correlated with the sub-dimension called *ability to decentralize* to such an extent that one may suspect them to be equal to one another. Another remark should be made about reliability; as this was a pilot study, more testing in other organizations must be performed before any further conclusions could be drawn.

Since the dual-role model is partly based on PDM, it was important to include a study that pointed at the importance of PDM (Study III). The sample used to test PDM was taken from a database gathered by Hakelius (1996) for a study on attitudes toward participative decision-making among Swedish farmers, who are organized within a cooperative. The response rate in the database was 52%, and thus, representativeness could be an issue. Otherwise the criteria for inferential statistics were met (Shavelson, 1996). The items for the questionnaire were thus re-organized to fit a new purpose – to test the relation between PDM and trust and commitment, respectively. The result was consistent with other findings on the relation between participative decision-making and the response variables *Trust* and *Commitment* (Erez, 1986; Locke et al., 1986). For instance, the response variables used in the current study are considered mediators in the goal-performance relation (Erez & Zidon, 1984; Locke & Latham, 2002), and in other studies on goal setting, commitment serves as a key mediator in the goal-

performance relation (Locke & Latham, 1990). The same is true for trust, as part of the 10-dimensional Creative climate questionnaire (Ekvall, 1996; Ekvall & Ryhammar, 1998).

In study IV, the interrelation between GLM and CCQ was investigated. A Spearman rank correlation suggested two dimensions of CCQ, debate and idea time, to be negatively related to one of the two GLM dimensions - leaders' ability to decentralize decision making about goal attainment. This result was unexpected as both GLM and CCQ are associated with creativity in organizations. A suggested explanation for this negative association was that CCQ and GLM are built on different theoretical foundations, which has been a common discourse when discussing some aspects of the outcome with Dr. Ekvall (personal communication, 2006 -).

The antecedent theories to CCQ are based on the person – task dimension, common in many models of organizational development. GLM on the other hand is using goal setting and connectionist models from the cognitive neuroscience. The difference in approach is manifested in Ekvall's assumption that time for idea generation – idea time – is important, in contrast to goal setting theory, where a narrow time frame for problem solving is preferred. Ekvall's rationale is the suggestion that if leaders' put too much pressure on people in the organization, the stress may block their ability to be creative. In goal setting, on the other hand, challenge, like narrow time frames, work to drive people's motivation to perform on a task, and based on suggestions given by Fenker & Schütze (2009), there is reason to believe that creation of new knowledge may be influenced positively by such a challenge.

A *conclusion* is that the difference between GLM and Brainstorming on the one hand, and between GLM and CCQ on the other, can be found in the way inter-personal exchange is organized. Where Brainstorming traditionally is applied on a group setting, GLM promotes loose and informal relations in analogy to a neural network. I was surprised by the result that indicated a lack of significant association between GLM and CCQ, because both models are similar in investigating influences on creativity among people in an organization. Further research is demanded in order to resolve that issue.

Finally, twenty years ago, Peter Senge argued that controlling and performing for others dominate our organizational cultures, and that there seems to be little room for cultivating our inherent curiosity and impulse to learn through experimental thinking. The ability to harness the "collective genius" within organizations, which is the key to sustain success on any market, has been destroyed by prevailing management-oriented systems (remember, humans have cultivated that tradition for 10,000 years!). This reasoning is consistent with Drori and Honig, both professors of management, who in the Harvard Business Review stated that: it is hazardous not to distribute creative responsibilities across the organization (as cited in Amabile & Kharie, 2008). Even though creativity has developed through evolution to become a predisposition for human beings, modern adult humans in general seem to avoid using this ability. Instead, people who are creative are perceived to be eccentric (Carson, 2011), and recent research suggest an association between bi-polar personality disorder and human creativity (de Manzano, Cervenka, Karabanov, Farde & Ullén, 2010).

With this thesis I have re-conceptualized creativity to be the common among humans, based on evolution, and that the starting point for the evolution of this ability appeared when our ancestors left Rift Valley.

I was one of the first to apply the concept of connectionism i.e. parallel knowledge exchange, on an organizational perspective, to illustrate its advantage over hierarchical communication. By combining this analogy with goal-setting, a competitive alternative is provided to traditional management. People should not assemble in formal meetings to block each other's idea generation. Instead, their leaders should assign clear and challenging goals, and then decentralize responsibility for decision making to people in the organization.

Summary in Swedish

Syftet med avhandlingen var att utveckla en modell för ledarskap som påverkar målorienterad social kreativitet i organisationer. Modellen, på engelska benämnd Generative learning management, har två dimensioner: målstyrning genom tilldelning och decentralisering av beslutsrätten över strategiutveckling för att nå målen i analogi med parallell distribution. I rent praktisk mening innebär det här att kunskap kan vara fragmenterad och utspridd på många platser samtidigt, vilket gör att inhämtning och sammanlänkning sker snabbt i jämförelse med andra system. För att illustrera mänsklig kreativ potential börjar jag med en kort tillbakablick i den moderna människans historia som sträcker sig ca 200 000 år bakåt i tiden; vi levde då som jägare och samlare. För 10 000 år sedan blev jordens klimat plötsligt varmare och stabilare, vilket innebar nya möjligheter för den anpassningsbara människan som började bruka jorden och forma komplexa samhällen. Den här nya varma perioden, Holocene, möjliggjorde fasta bosättningar och odling av grödor samt möjligheten att hålla tamboskap i ett långsiktigt perspektiv, en livsstil som under 5000 år spred sig från Palestina och Mesopotamien till de nordöstra delarna av Indien och de Brittiska öarna i väst. Den här relativt snabba utspridningen demonstrerar dels människans förmåga att anpassa sig till nya förutsättningar, dels vår förmåga att hitta nya konstruktioner och processer för att lösa problem; när Sumererna uppfann skrivkonsten blev det möjligt att utveckla system för räkenskap av handel och logistik. Med finansiella resurser och teknologiska landvinningar kunde skrivkonsten sedan utvecklas och spridas, och takten på utvecklingen mot de komplexa samhällen vi känner idag ökade.

Men det fanns redan då en baksida, då samhällen och organisationer utvecklades till hierarkier snarare än att bygga vidare på det nätverksformat vi förvaltat i nästan 200 000 år. Med det hierarkiska samhället placerades en person högst uppe i toppen som styrde över underordnade mellanchefer och arbetare. Historien är fylld av exempel på hur det hierarkiska maktutövandet dragits till sin spets; människans historia är i mångt och mycket en berättelse om hur vi kultiverat hierarkiskt tänkande och tryckt undan vår naturliga disposition för att lösa svåra problem med uppfinningsrikedom; vi premierar idag kontroll och försiktighet framför ett naturligt risktagande. Det här hierarkiska synsättet var sannolikt en av de premisser som styrde utvecklingen av hur man skulle se på kunskap. Först i början 1900-talet anade man att kreativitet kan vara resultatet av mentala processer inom personen.

Idag anses kreativitet vara resultatet av ett tänkande där mentala kunskapsobjekt, eller fragment av dessa, kombineras till nya begrepp – meningsfulla kognitiva strukturer. För att anses som kreativa bör de nya begreppen vara både nyttiga och originella för en viss grupp eller kultur. De här processerna sker som ett samspel mellan olika delar av människans hjärna dels den del som hanterar medvetet tänkande, dels den del som hanterar omedvetet tänkande..

Processerna kan beskrivas som parallellt distribuerade och automatiserade, dvs. de är decentraliserade men styrda i den riktning som uppmärksamheten för tillfället pekar åt. Tillämpat på en organisation innebär det att fragment av kunskap sprids ut och lagras hos flera olika personer samtidigt. Om dessa personer själva äger beslutsrätten att utveckla strategier för att lösa problem, upprättar de automatiskt

kontakter med varandra för att utbyta eller sammanlänka erfarenheter som kan leda till en lösning. Det här ger en dynamisk struktur som jag föreslår bör överträffa effekten av formella möten.

Organisationer och deras chefer och team utsätts ständigt för nya utmaningar och konkurrens som kräver det som brukar kallas ”ständig förändring” av processer för hur man löser problem. En kommunikationsarkitektur som stimulerar självständighet i problemlösning kan antas bli en värdefull förutsättning för de organisationer som har ambitionen att hänga med i marknadens svängningar. Initiativet till självständighet styrs av organisationens ledare.

Ledarskap definieras ofta som en process där en person påverkar en grupp av människor att nå ett gemensamt mål. Målstyrning är bevisat effektivt för att motivera människor att prestera, och forskningen på området demonstrerar en linjär relation mellan mål och prestation. Tydliga och utmanande mål påverkar prestation genom att rikta uppmärksamhetsfokus, mobilisera ansträngning, samt öka uthålligheten för att nå det uppsatta målet.

I den första artikeln utformades en två-komponentmodell som beskriver hur ledare kan agera för att påverka interpersonell kreativitet (alltså de utbytesprocesser som föreslås bidra till att lösa komplexa problem); utgångspunkt var tre teoriområden: (1) medbestämmande kontra tilldelning vid beslutsprocesser, (2) målstyrning, samt (3) parallell kunskapsdistribution. Enligt modellen bör chefer använda två roller parallellt. Den ena rollen är autokraten som formulerar och tilldelar beslut om vilka mål organisationen ska rikta sin uppmärksamhet mot. Den andra rollen är demokraten eller facilitatorn som decentraliserar den exekutiva funktionen att utveckla strategier för att nå målen till personalen; skapa parallellt distribuerade utbytesprocesser av kunskap mellan medarbetare för att lösa komplexa problem. Att agera beslutsfattare respektive att decentralisera arbetet med hur målen ska uppnås, är motpoler på samma skala - deltagande i beslutsprocesser.

I den andra artikeln testades ledarskapsmodellen från den första artikeln, med avseende på modellens relation till inter-personell kreativitet. Med statistisk metod reducerades enkätfrågorna till de faktorer som svarade mot de två rollerna i modellen generative learning management: tilldelning av mål och decentralisering av beslutsätten att utveckla strategier för att nå målet. Sedan genomfördes en sambandsanalys som bekräftade modellens relation till inter-personell kreativitet. Resultatet visade att en ledare bör lägga lika stor vikt vid tilldelning av mål som decentralisering av beslutsprocesser för att nå målen. Det framgick också att modellen var relaterad till människors tilltro till sin egen förmåga att lösa problem, så kallad self-efficacy, som är en viktig egenskap för måluppfyllelse.

I den tredje artikeln undersöktes en medlemsförening och effekten av medbestämmande testades på tilltron till den kooperativa tanken och förtroendet för dem som leder kooperationen, i det här fallet en svensk lantbrukskooperation. Hypotesen var att i en medlemsförening efterfrågar människor medbestämmande om saker och ting, till skillnad från anställda i företag och organisationer vilka fördrar tilldelning av beslut. Lantbrukares (medlemmars) uppfattning om åtagandet för organisationens ideologi och förtroende för ledningen testades därför med tre variabler som traditionellt används i kooperationsteori för att förklara framgång: medlemmars tillfredsställelse med verksamhetens lönsamhet, deras ålder samt deras erfarenhet av

ledningsarbete. En ytterligare variabel - upplevelse av deltagande i beslutsprocesser - lades till förklaringsmodellen och visade sig vara den avgörande faktorn för medlemmarnas åtagande för organisationens ideologi och förtroende för ledningen.

I en fjärde studie jämfördes ledarskapsmodellen med en modell för kreativt klimat i en frågeformulärsstudie. Antagandet var att det skulle finnas ett flertal positiva samband mellan de tio klimatdimensionerna och ledarskapsmodellens två dimensioner. Istället uppstod negativa relationer mellan två av dimensionerna från arbetsklimatmodellen – debatt och idétid - med ledares förmåga att decentralisera beslutsrätten i frågor som rör måluppfyllelse. Utfallet var oväntat eftersom både GLM och CCQ är associerade med kreativitet i organisationer. En förklaring till de negativa relationerna är att GLM och CCQ bygger olika teorier, vilket har varit ett vanligt diskussionsämne i samtal med Ekvall. De teorier som förekommer CCQ bygger på en så kallade person – task dimension som är vanligt i modeller som beskriver organisationer. GLM, å andra sidan, använder målstyrningsteori och connectionism från kognitiv neurovetenskap. Olikheterna i respektive modell manifesteras i Ekvalls antagande att tid för idégenerering är viktigt, medan målstyrningsteori menar att snäva tidsramar är att föredra. Ekvalls resonemang är att om ledare sätter för mycket press på personalen så kommer stressen att hämma deras förmåga att vara kreativa. I målstyrning är det utmaningar, som att ha snäva tidsramar, som driver motivationen att prestera. Det finns anledning att tro att samma typ av utmaningar påverkar skapandet av ny kunskap.

En slutsats är att skillnaden mellan GLM och Brainstormning å ena sidan, och GLM och CQQ å den andra, kan ses i hur inter-personella utbytesprocesser är organiserade. Där GLM stödjer lösa, informella relationer, används Brainstorming i traditionella mötesstrukturer. Gäller samma sak för CCQ? Ytterligare forskning krävs för att lösa den frågan.

Slutligen, 1990 skrev Peter Senge, en av förgrundsgestalterna för lärande i organisationer, att vår kultur domineras av kontrollmentalitet, och att det tycks finnas lite utrymme för att kultivera vår medfödda nyfikenhet och impuls att lära nya saker genom experimentellt tänkande. Förmågan att utnyttja den kollektiva genialiteten inom organisationer, som är nyckeln till att upprätthålla framgång på alla typer av marknader, har förstörts av olika ihållande management-orienterade system (kom ihåg att människan kultiverat den förmågan i 10 000 år!). Det här sättet att resonera är konsistent med Drori and Honing, båda med professurer i management. I en artikel i Harvard Business Review hävdar de att det är farligt att inte distribuera ansvaret för kreativitet till organisationen.

Även om kreativitet har utvecklats genom evolutionen till att bli en mänsklig predisposition, så verkar människor i allmänhet undvika möjligheten att använda den färdigheten. Istället upplevs kreativa uttryck som excentriska, eller associerade med bipolär personlighetsstörning.

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