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Connecting the literature on organizational creativity through bibliometric research

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How to manage creativity in organizations: connecting the literature on organizational creativity through bibliometric research

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Abstract

To be competitive, organizations must also be innovative, making organizational creativity a crucial capability. Accordingly, the past decade has seen an increasing attention among scholars to fields such as innovation, organizational performance, and employee's creativity. Nevertheless, studies in organizational creativity, i.e., the management of creativity at an organizational level, are still fragmented and have not converged into a single comprehensive conceptual model. The purpose of this paper is to scrutinize the literature on organizational creativity in order to map the different perspectives on the subject and provide direction for future research. The paper thoroughly explores the literature through bibliographic research on papers published between 1980 and 2020. The literature is mapped, categorized, and analyzed to identify the different models of organizational creativity, i.e., concepts, definitions, and theories. The paper identifies seven models and shows that field could converge by connecting two tracks of the literature: the track of the dynamic componential model with the track of the personal and contextual factors. Furthermore, the paper uses this insight to propose practical guidelines for managing creativity by mapping contextual factors at the individual, team, and organizational levels that can be used with the dynamic componential model.

Keywords: organizational creativity, bibliometric study, creativity, organization.

1. Introduction

Innovation is vital for the existence of and growth of organizations. They need to capture new ideas and concepts and adapt to continuous change. Organizations are concerned with the two closely related terms creativity and innovation. Creativity is the generation of new and useful ideas in organizations, while innovation is the successful implementation of these new ideas (Woodman, et al., 1993; Gaspersz, 2005). Creativity can thus be said to serve as a seed for innovation (Amabile,

1998). In order for organizations to develop more innovative products, processes or services, they need to manage creativity as an organizational phenomenon and understand how to promote the generation of novel ideas. This ability requires the management of creativity inside the organization.

The creativity of the individual employees in the organization is an important source of innovation. However, the recruitment of new creative employees is not sufficient to make creativity as a source of organizational effectiveness (Woodman, et al., 1993) and organizational capability (Amabile, 1998). In order to utilize creativity at the organizational level, organizations need to develop their organizational structures to enable innovative processes (Dziallas & Blind, 2019). These considerations call for research on organizational creativity as more than the sum of the individual, team, and collective levels of creativity and to place greater emphasis on the ways organizations can manage creativity. Even though organizational creativity has been studied as a concept since the late 1980s, there is still no clear consensus about its definition.

The concept of organizational creativity was initially considered a less explored branch of innovation management studies (Woodman, et al., 1993). Initial studies of organizational creativity were divided into two approaches: the individual/collective level and the organizational contextual level. At the individual and collective level, organizational creativity was understood as the creativity generated by an individual or a group of people within an organization. The psychological perspective (Ford, 1996), individualistic creativity perspective, social creativity (Harrington, 1990), employee driven innovation, intrapersonal and interpersonal creativity (Csikszentmihalyi & Gardner, 1994) are among different perspectives of creativity within an organization. The approach of the organizational contextual level is used, among others, by Woodman et al. (1993) who refers to organizational creativity as the “production of novel and useful outcomes by people working together in complex organizational context”. In this model, organizational creativity is understood as a multilevel phenomenon considering the three levels of the individual, the team, and the organization. This approach is shared by Andriopoulos (2001) and McLean (2005), who argue that organizational creativity is determined by contextual factors such as organizational culture, resources, and skills.

Other scholars have expanded these two approaches by studying the relationship between individual creativity and innovation such as Amabile (1997) and individual creativity and organizational creativity such as Bharadwaj & Menon (2000) and Oldham & Cummings (1996). Research on collective creativity has also been carried out, which was considered similar to organizational creativity (Hargadon & Bechky, 2006; Klijn & Tomic, 2010).

Although organizational creativity has now been studied for three decades, it has still not been shaped into a coherent concept by the literature. This absence of consensus on the nature of the subject prevents practitioners from learning about a topic of great importance.

This paper aims at identifying the various aspects of organizational creativity as a concept in the literature in order to investigate the relationships between organizational creativity and its related fields. The research questions are:

- What are the connections between the literature on organizational creativity?
- What models of organizational creativity are presented and how do they relate to each other?
- What advice does the literature provide with respect to managing organizational creativity?

2. Methodology

In order to answer the research questions, this paper conducts a bibliographic research of papers published between 1980 and 2020. The objective is to identify the different models and theories of

organizational creativity in the literature and the factors and context related to organizational creativity. Furthermore, the paper investigates the relationships between the publications by creating a citation map and categorization of co-citations. The literature is subsequently scrutinized in order to identify the different models of organizational creativity that are used to give advice based on the current literature on managing organizational creativity. The paper reviewed the organizational creativity literature as a bibliographic review. In the review, a comprehensive search of the database Web of Science was conducted. In the first step, organizational creativity and related keywords were used to search the literature published during 1980 to 2020, and 5526 articles were identified. Then papers from fields unrelated to organizational creativity (such as medical, information system, geography, environmental study, architectural and urban study) were omitted, leaving 3226 articles. In the next step, the publications that had the term “organizational creativity” either as a keyword, or in their title or abstract were selected. Finally, the full body text was scrutinized in the identified publications. Both the terminology of innovation and creativity were used. In the final selection, after checking all the selected articles, 512 documents were included in the study.

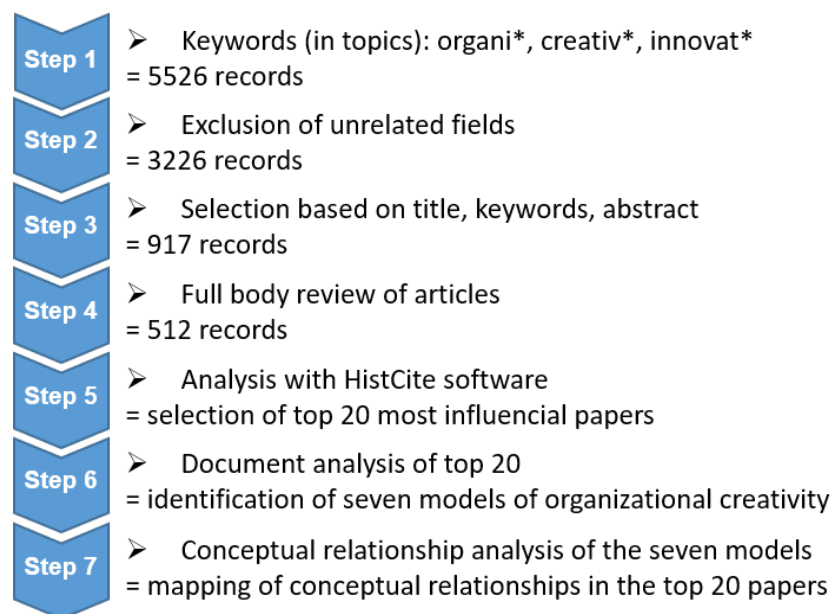


Figure 1: Methodology and bibliometric selection criteria

The data was analyzed using HistCite software to map influential publications in the research field as well as the interrelations between these publications, allowing for an assessment of the development of the topic (Börner et al., 2003; Janssen et al., 2006; Janssen, 2007). In the next step, the full citation and bibliographic records were imported to the program (such as full records of the article’s citation information, including the title, abstract and the cited referenced list). The completeness of records was checked and, in the cases, where anything was missing, it was added manually. The software was then used to calculate the Total Global Citation Score (TGCS) referring to the total score in Web of Science for all the publications of an author and source, the Total Local Citation Score (TLCS) that shows the frequency of local citation inside the collection. Furthermore, TLCS/t and TGCS/t were calculated. TLCS/t is the total local citation score per year from the time the research papers’ publication to the end of the sample period, while TGCS/t is the frequency of annual citation based on the database. Finally, LCS/t shows the average LCS per year since the

publication date and GCS/t shows the average GCS per year since the publication date. Based on the bibliometric analysis, the paper identified the most cited authors, journals, and keywords.

Based on the different bibliometric analyses, the papers in the database were scrutinized in order to identify the most influential articles in the field of organizational creativity. This was finally done by selecting the top 20 papers with the highest TGCS.

The top 20 most influential papers were then scrutinized to identify what conceptual models of organizational creativity that were used in the papers. This was done by analyzing all of the articles, and thoroughly identify the conceptual model of organizational creativity, the definition, the foundational theory and the contribution to the field. While some papers presented their own conceptual model, others relied on existing models previously published, i.e., review papers or primarily empirical papers. This analysis led to the formulation of a conceptual overview of the field, presented in a table.

In order to answer the research question of how the models of organizational creativity relates to each other, an analysis was carried out of the top 20 papers and their relationships to each other. This was done by mapping which papers cite each other (denominated *), which discuss each other (denominated **), and which uses another paper's model as theoretical foundation (denominated ***). This analysis was mapped in a timeline to show the conceptual relationships in the literature base of organizational creativity.

The presented analyses were then used to analyze the relationships in the literature and to identify gaps in the literature, yielding a list of factors identified in one part of the literature but omitted in another part. These identified factors were then discussed to bridge the literature gap and yield new insights about how to manage organizational creativity in practice.

3. Analyses of the connections within the organizational creativity literature

The first result of the bibliometric study is an overview of the authors with the most cited publications. In Table 1, the authors with the most citations are listed based on the TLCS of their articles. It was necessary to revise the table we got from the software because the co-authors were also listed in that table. The first author is Woodman with a TLCS of 87 and TGCS of 1617 and the second author in the list is Amabile with a TLCS of 61 and TGCS 1805.

Table 1. The most cited authors sorted by TLCS.

Author	TLCS	TLCS/t	TGCS	TGCS/t
Woodman R.W.	87	3.11	1617	57.75
Amabile T.M.	61	2.36	1805	69.63
Oldham	57	2.28	1453	58.12
Zhou J	39	4.96	866	104.51
Drazin R	35	1.59	531	24.14
Anderson N	32	4.57	646	92.29
Hargadon & Bechky	19	1.27	463	30.48
Baer M	16	1.78	212	23.56
Axtell C.M	12	0.52	434	20.67
Bharadwaj & Menon	11	0.52	151	7.19

The next finding is related to the identification of journals that have the highest TGCS and the most publications. Table 2 shows the name of 15 journals with the highest TGCS published in the field of organizational creativity. The first journal is “*Academy of Management Review*”, which has a TGCS of 2259 and a TLCS of 132. “*Academy of Management Journal*” with TGC 1865 and TLCS 87, “*Research in Organizational Behavior*” with TGCS 1717 and TLCS 58 and “*Journal of Management*” with TGCS 653 and TLCS 33 are in the following places. These journals have the highest TLCS as well. “*Creativity and Innovation Management*” has published the most articles (33 records) and “*Journal of Product Innovation Management*” has published 14 articles and “*Creativity Research Journal*” has 13 published articles in the field of organizational creativity.

Another finding is the most cited articles, which have been studied according to the frequency with which they use the related terms. A list of the most frequently used terms in the publications was generated and, as expected, the most frequent was the word “creativity.” The word “innovation” came second, which demonstrates the close relationship of this word to the word “creativity” in this area of research. According to this list, the most related words and areas are innovation, performance, leadership, climate, knowledge, development, effects, social, support, individual, behavior, strategy, psychological, learning, team, transformational, leader, cultural. In Figure 2, the relation of TLCS, TGCS and number of records based on the related words has been shown. Note that the words “creativity” and “innovation” have been excluded from the Figure 2.

Table 2. The most cited journals sorted by TGCS.

Journal	Recs	TLCS	TLCS/t	TGCS	TGCS/t
Academy of Management Review	4	132	6.13	2259	97.66
Academy of Management Journal	8	87	5.71	1865	107.03
Research In Organizational Behavior	1	58	1.76	1717	52.03
Journal of Management	5	33	5.07	653	95.79
Journal of Business Research	11	14	1.13	520	41.57
Organization Science	6	21	1.55	505	36.87
Journal of Occupational and Organizational Psychology	4	14	0.73	434	20.67
Organizational Behavior and Human Decision Processes	2	5	0.41	431	25.48
Creativity and Innovation Management	33	24	3.19	223	30.20
Leadership Quarterly	7	12	0.77	220	12.22
Advances in Developing Human Resources	1	0	0	191	11.94
Industrial and Organizational Psychology/ perspectives on Science and Practice	1	7	0.58	177	14.75
Journal of Product Innovation Management	14	14	1.05	167	9.48
Creativity Research Journal	13	9	0.76	156	11.22
California Management Review	1	0	0	139	6.95

According to Figure 2, quite a high number of articles considered *Leadership* in their study and, a relatively high number of TLCS and TGCS related to leadership. In spite of this, the number of records for “*Organizational Contextual*” is lower than “leadership” but both TLCS and TGCS are significantly higher. Additionally, the term “*sense-making*” has a very low number of records, whereas the TLCS and TGCS are relatively high for this word and this result shows the high quality of articles that took this topic into consideration in their studies.

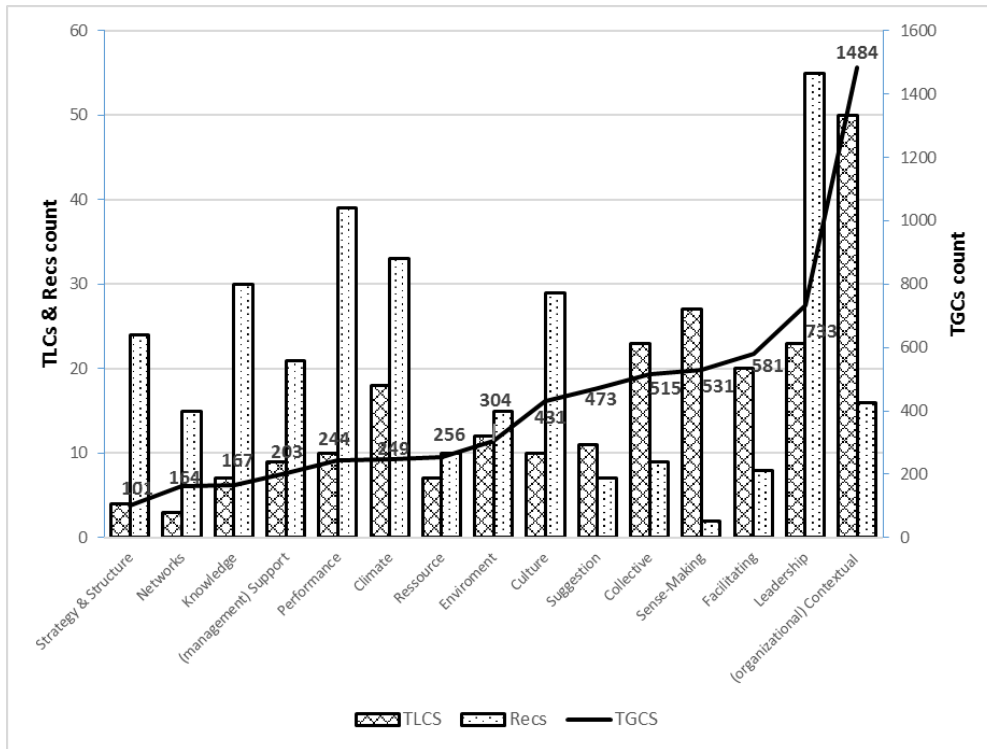


Figure 2: The most used terms in most cited articles

Figure 3 shows the trend of significant increase in the number of publication and distribution of number of articles, according to TLCS and TGCS, in the period between 1988 and 2019. According to this figure, the highest values of TGCS and TLCS are for the articles published before 2000. This was to be expected since the number of citations from high-quality articles will increase over time and more recent articles therefore mostly have lower citation scores than the early articles that have been cited by scholars for decades. By checking the number of records, it furthermore seems to be the case that the number of records are stable until 2008, and after 2008 the number of articles increase exponentially, which shows that this topic has been subject to more attention from scholars in recent years. Moreover, in 2014, the TGCS and TLCS are relatively high, which shows that the articles published in this year have had a significant impact on more recent studies. Additionally TLCS in 1988, 1993, 1996 and 2014 constitute almost 10%, 15%, 10% and 10% of all the citations in the literature respectively, which is consistent with the information in Table 3.

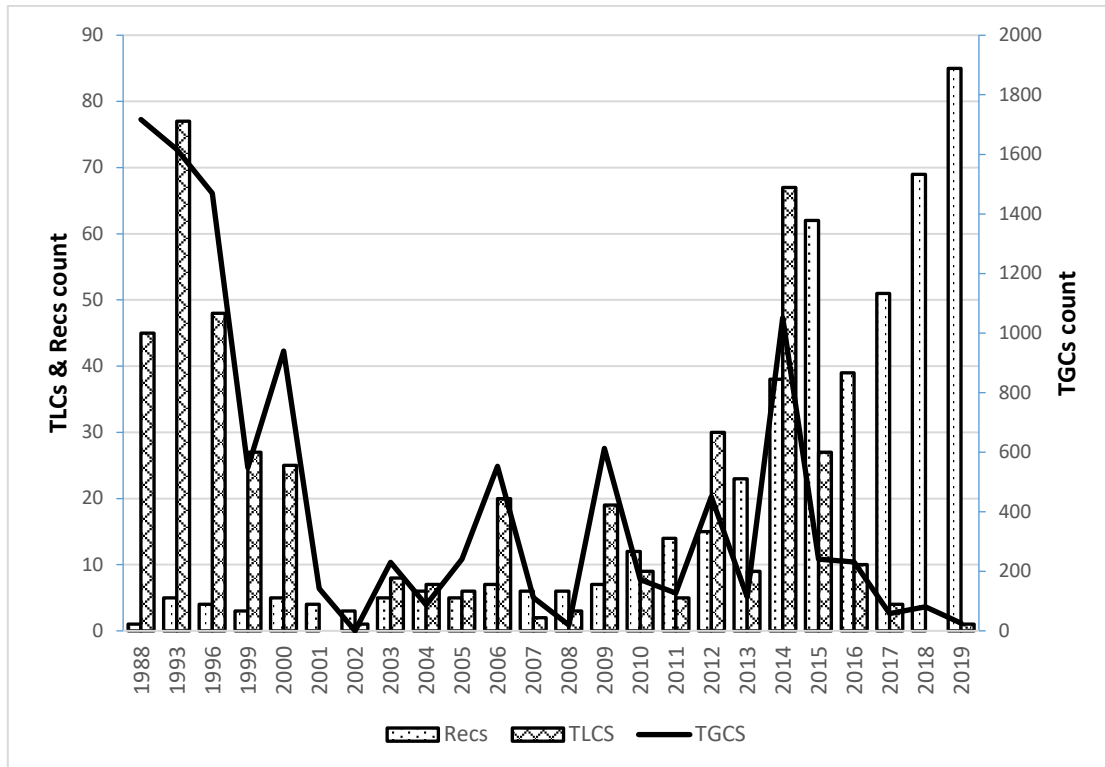


Figure 3: The distribution of TGCS, TLCS and number of records during time

Table 3 lists the ten most influential papers sorted on TLCS of the database of 512 records. The most cited paper in the local database is *“Toward a theory of organizational creativity”* with a TLCS of 87 and a TGCS of 1617 (Woodman, et al., 1993), the second most cited is *“A model of creativity and innovation in organizations”* with a TLCS of 58 and a TGCS of 1717 (Amabile, 1988), and the third is *“Employee creativity, personal, and contextual factors at work”* with a TLCS of 57 and a TGCS of 1453 (Oldham & Cummings 1996).

Table 3. The most cited articles sorted by TLCS.

Author	TLCS	TLCS/t	TGCS	TGCS/t
Toward a theory of organizational creativity (Woodman et al., 1993)	87	3.11	1617	57.75
A Model of creativity and innovation in organizations (Amabile, 1988)	58	1.76	1717	52.03
Employee creativity: Personal and contextual factors at work (Oldham & Cummings, 1996)	57	2.28	1453	58.12
Multilevel theorizing and creativity in organizations: a sensemaking perspective (Drazin et al., 1999)	35	1.59	531	24.14
Innovation and creativity in organizations: A state-of-the-science review, Perspective Commentary, and Guiding Framework (Andersen et al., 2014)	32	4.57	646	92.29
When collections of creatives become creative collectives: A field study of problem solving at work (Hargadon & Becky 2006)	19	1.27	463	30.87

Putting creativity to work: the implication of creative ideas in organizations (Baer, 2012)	16	1.78	212	23.56
Shopfloor innovation: Facilitating the suggestion and implementation of ideas (Axtell et al., 2000)	12	0.57	434	20.67
Transformational leadership, creativity, and organizational innovation (Gumusluoglu & Ilsev 2009)	11	0.92	409	34.08
Awakening employee creativity, the role of leader emotional intelligence (Zhou & George 2003)	7	0.39	220	12.22

The final ten articles of the top 20 are Paulus & Yang (2000), McLean (2005), Bledow et al. (2009), Bharadwaj & Menon (2000), Ramus (2001), Harvey (2014), Kijkuit & van den Ende (2007), Mainemelis & Ronson (2006), Amabile & Pratt (2016), and Mathisen & Einarsen (2004).

4. Analysis of the models of organizational creativity in the literature

The identified top 20 most influential papers of organizational creativity were scrutinized in order to identify the models of organizational creativity used in the literature. For each identified conceptual model, the concept, the definition, and the main contribution to the field were listed. The analysis showed that seven papers presented an original conceptual model, while the rest of the papers relied on these previously published models. For example, review papers such as Mathisen & Einarsen (2004), McLean (2005), Bledow et al. (2009), and Andersen et al. (2014) used one or more of the other models, but did not propose any new model. In the same way, Paulus and Yang (2000), Kijkuit and Van den Ende (2007), Bharadwaj and Menon (2000), and Axtell et al. (2000) were empirical papers that used the conceptual models of organizational creativity from other papers. Finally, two of the papers extended previous models, but did not present an original model, i.e., Gumusluoglu and Ilsev (2019) extend the Woodman et al. (1993) model and Amabile and Pratt (2016) extend the Amabile (1988) model. Table 4 presents the seven key conceptual models of the organizational creativity field based on the comprehensive bibliometric analysis. Table 4 is based on the entire literature base and is sorted by TLCS, making it more comprehensive than similar reviews of the field, e.g., by Andersen et al. (2014).

Table 4. Summary of the seven most influential models of organizational creativity.

Model of organizational creativity	Concept	Definition	Contribution	Article
Interactionist model TLCS = 87	Organizational creativity	“Creation of useful and novel outcomes by people who work collectively in a complex organizational context”	Multilevel interactionist model of organizational creativity	Toward a theory of organizational creativity (Woodman et al., 1993)
Componential model TLCS = 58	Creativity in organizations	Creativity is related to the generation of the ideas, whereas innovation is mainly successful implementation of them	Componential model of creativity in organizations	A model of creativity and innovation in organization (Amabile, 1988)

Personal and contextual factors for creativity model TLCS = 57	Creativity in personal and contextual organization	Products, ideas, or process that satisfy two conditions: 1) new or original 2) potentially relevant or useful, for the organization.	Organizational knowledge core competencies Cultures integration	Employee creativity: personal and contextual factors at work (Oldham & Cummings, 1996)
Multi-level perspective & Sense-making model TLCS = 35	Creativity in organizations	“Creativity is a process of engagement in creative acts, regardless of whether the outcomes are useful, novel or creative.”	Sociological model of intra-individual and intra-organizational sensemaking in the creative process overtime	Multilevel theorizing about creativity in organization: a sense making perspective (Drazin et al., 1999)
Collective cognition model TLCS = 19	Collective creativity	Collective creativity emerges as products of a momentary collective process	Model of collective creation	When collections of creative become creative collectives: a field study of problem solving at work (Hargadon & Becky, 2006)
Dialectic model of extraordinary group creativity TLCS = 10	Synthesis creativity	The integration of group members' perspectives is the foundation for new ideas.	The process of creative synthesis can help groups to produce breakthrough ideas over time to achieve extraordinary levels of creative success.	Creative Synthesis: Exploring the process of extraordinary group creativity (Harvey, 2014)
Leader emotional intelligence TLCS = 6	Creativity in the workplace	Five routes through which the innate creativity of organizational members can be awakened.	Leaders emotional intelligence in five creative routs can influence awaking, enable and promote employee's creativity	Awakening employee creativity The role of leader emotional intelligence (Zhou & George, 2003)

In the interactionist model of organizational creativity (Woodman et al. 1993; Woodman 2008), a multi-level model of organizational creativity is presented. This model emphasizes that creativity arises as a result of a complicated interaction between individuals and their work situation at different organizational levels. This model proposes a creative performance of the social system, which is an aggregation from the creative performance of groups, and the organizational facilitation of creativity (Woodman et al. 1993). The individual level considers personality, cognitive style, intrinsic motivation, knowledge, social, and contextual influences. At the group level, the group composition, characteristics and processes are considered, and at the organizational level, the aggregation of individual and group level are considered. The interactions model pays more attention to the team and group level creativity compared to the componential model. This model develops the perspective of interactional psychology to bear on the integration of process, product, person, and situation into

a more comprehensive theory of organizational creativity than previously proposed (e.g., by Amabile, 1988).

The componential model of organizational creativity and innovation by Amabile (1988) describes the creative process as constituted by three elements: the domain relevant skills (knowledge and technical skill), the creativity relevant skills (cognitive thinking style, working style, and personality characteristics) and intrinsic motivation. In this model, creativity is at the intersection of these three elements. In a later paper, Amabile (1997) also proposes that contextual factors either inhibit or facilitate creativity within the organizations and considers the role of the workplace environment. In this model, they proposed a systematic approach to organizational creativity and suggests the importance of influential factors. In their review of contextual factors conducive to creativity, Shalley et al. (2004), for instance, claim that all contextual factors impact intrinsic motivation, which becomes the mediator between context and employees' creative output. This model also received some empirical support for components as well as the role of the motivation component (Shalley, Zhou, & Oldham 2004; Zhou & Shalley, 2010). Furthermore, Woodman et al. (1993) build on Amabile's (1988) view that individual and context are contingent in creative processes and presented another comprehensive model of organizational creativity.

The model presented by Oldham & Cummings (1996) is generally consistent with earlier interactionist approaches to understanding creativity (Amabile, 1987; Woodman et al, 1993) and suggests that management should consider both personal and contextual factors to increase creativity in work organizations. In their personal and contextual creativity model, Oldham & Cummings (1996) consider the contribution of employee's creativity-relevant personal characteristics and organizational characteristics such as job complexity, supportive, and controlling supervision. The model highlights how creative work happens when employees have appropriate creativity-relevant characteristics, work on complex and challenging tasks, and are supervised in a supportive and non-controlling environment. Their results suggest that if creativity at work is to be enhanced, an individualized or selective approach to management may be warranted. For example, individuals with high levels of creativity-relevant personal characteristics might be identified through use of assessment instruments such as the CPS (Creative Personality Scale) and the normative baselines that accompany these instruments (Gough, 1979).

The collective creativity model (Hargadon & Bechky, 2006) considers collective patterns of interrelated activities between different people in groups over time (Hargadon & Bechky, 2006; Weick, et al. 2008). The level of involvement of people in a group, their attention to others, and their engagement are all crucial factors in determining their relationship with the group (Hargadon & Bechky, 2006). In this model, the focus is more on the group in the organization, and collective creativity is considered a social process. Furthermore, this model adapts the Amabile (1988) perspective that creative solutions are built from the recombination of existing ideas as well as the individual component in the componential model.

In the multi-level and sense making theory by Drazin et al. (1999) they aimed to complement theoretical contribution by Amabile (1988) and Woodman et al. (1993). In this theory, they present the multilevel theory of creativity within organizations in which they define creativity as a process of engagement in "creative acts". In their view, organizational creativity is a product of negotiating multiple, competing interests between various communities or groups within an organization. To them, it consists specifically of the creative engagement of different communities. The model has organizational creativity comprising of a number of complex interdependencies, through which individuals, communities, and organizational systems can affect creativity in organizations (Drazin, et al. 1999). The aim of the model is to understand how individuals engage in creative endeavors at

multiple levels rather than searching for regularities and factors that contribute to an increase in creative output. Managerial understanding and frames of reference are central for the model.

The leader emotional intelligence model (Zhou & George (2003), proposes five routes through which creativity can be awakened in the workplace and also propose that emotional intelligence provides leaders with the capability to use these routes to effectively promote creativity among their subordinates (Zhou & George. 2003). They used the definition of creativity in the workplace as the production of novel and useful ideas or solutions (just as Amabile, 1988; Oldham & Cummings, 1996). The model builds on the personal and contextual factors for creativity model (Oldham & Cummings, 1996) and furthermore considers the creativity-related supervisor behaviors such as being supportive in a non-controlling manner.

In the dialectical model presented by Harvey (2014), she proposes that the process of creative synthesis improve the chance that a group’s idea becomes breakthrough. Synthesis creativity is defined as integration of group members’ perspectives. In this model, the Hargadon & Bechky (2006) theory of moments of collective creativity as involving not only the original question, but also considering whether there is a better question to be asked is used. Furthermore, the model builds on Amabile’s (1998) definition of creativity as usefulness and novel ideas, as well as group members creative thinking skills.

In order to answer how the presented models of organizational creativity relate to each other, an analysis was carried out on the top 20 papers to identify relationships. Each paper was analyzed to identify which of the conceptual models the paper either had a weak, moderate or strong relationship to (see Table 5) and then the relationships were mapped in a timeline to identify any tracks in the development of the literature base (see Figure 4). For simplification, only five of the conceptual models are shown in Table 5, as Zhou and George (2003) was not cited by in the top 20 and Harvey (2014) was published so late in the timeline that it had no other citations from the top 20 papers, not even Amabile and Pratt (2016).

Table 5: How the top 20 papers are connected to the five models of organizational creativity.

Article	Componential model (Amabile, 1988)	Interactionist model (Woodman, 1993)	Personal and contextual creativity model (Oldham, 1996)	Multilevel theory and sense making perspective (Drazin, 1999)	Collective creativity model (Hargadon, 2006)
Amabile (1988)	***	N/A	N/A	N/A	N/A
Woodman et al. (1993)	**	***	N/A	N/A	N/A
Oldham & Cummings (1996)	**	**	***	N/A	N/A
Drazin et al. (1999)	**	**	**	***	N/A
Paulus & Yang (2000)	-	-	-	-	N/A
Axtell et al. (2000)	-	*	**	-	N/A

Bharadwaj & Menon (2000)	**	*	-	-	N/A
Ramus (2001)	-	-	-	-	N/A
Zhou & George (2003)	**	*	**	*	N/A
Mathisen & Einarsen (2004)	***	-	-	*	N/A
McLean (2005)	***	-	**	-	N/A
Mainemelis & Ronson (2006)	-	*	**	-	N/A
Hargadon & Becky (2006)	***	*	*	*	***
Kijkuit & van den Ende (2007)	**	-	-	**	-
Gumusluoglu & Ilsev (2009)	-	*	**	-	-
Bledow et al. (2009)	**	-	-	-	-
Baer (2012)	-	*	*	-	-
Anderson et al. (2014)	**	**	**	*	*
Harvey (2014)	**	*	-	**	***
Amabile & Pratt (2016)	***	***	-	***	***

Citation only = *. Discussion of the theory = **. Uses the theory conceptually = ***. Not applicable due to timeline = N/A.

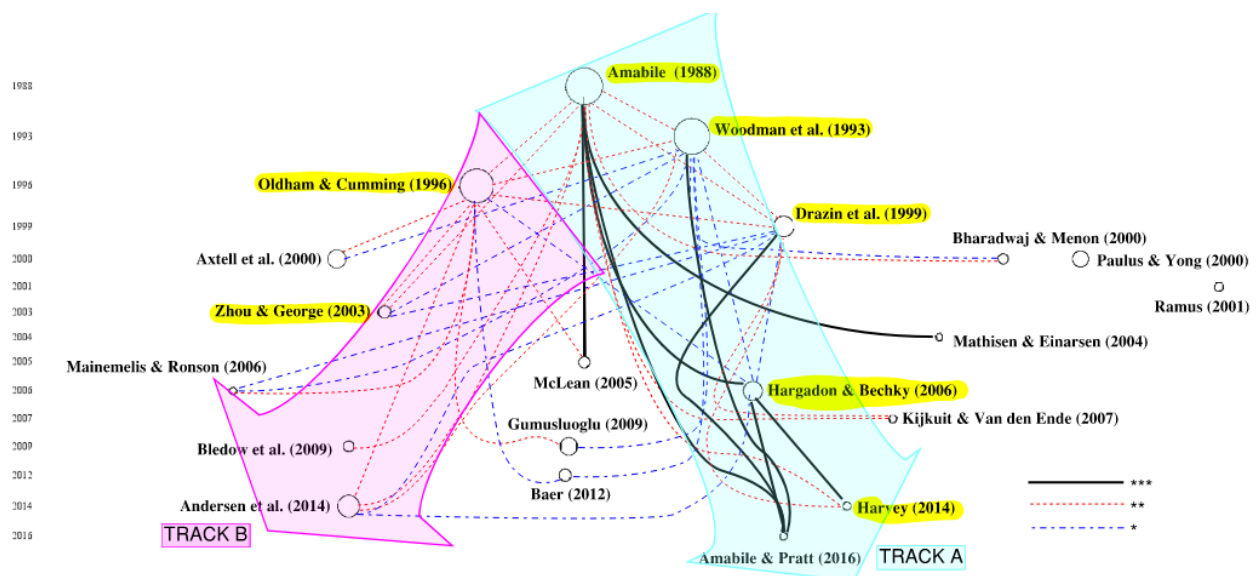


Figure 4: A timeline of relationships in the literature on organizational creativity.

Figure 4 shows, there is a primary track of convergence in the literature (track A), that connects four of the top seven models, which ends with the two comprehensive models presented by Amabile and Pratt (2016) and Harvey (2014). They both have strong conceptual connections to the componential model (Amabile, 1988) and the collective creativity model (Hargadon & Bechky, 2006), and at least moderate to multi-level and sensemaking model (Drazin et al., 1999). Amabile and Pratt (2016) furthermore have a strong connection to the interactionist model (Woodman et al. 1993). However, none of these papers have a connection to the personal and contextual factors model (1996), which is the second most cited paper in the organizational creativity literature.

Oldham and Cumming (1996) establish a secondary track in the organizational creativity literature, track B in Figure 4, represented by Zhou and George (2003) and culminating in Andersen et al. (2014). This track contributes to the literature with personal and contextual factors, as well as the

role of leader emotional intelligence. While Andersen et al. (2014) provide a list of contextual factors, they do not connect their contribution to the primary literature track, as they barely mention the models from Drazin et al. (1999) and Hargadon & Bechky (2006) in their otherwise comprehensive review paper. Therefore they do not manage to close the literature gap between the two tracks.

We argue that the organizational creativity literature needs to connect the two tracks in order to provide consistent guidelines for practitioners. The main contribution of the track B is creativity factors such as personal and contextual factors and leaders' emotional intelligence, which Anderson et al. (2014) review and organize in an extensive list of factors as supplementary material to their article organized by individual, team, and organizational factors. As illustrated on Figure 4, the divergence between the two tracks occurs around year 1999, whereafter track A does not cite any of the track B papers. To highlight the gap in the literature, we carried out a final analysis: Using the structure from Anderson et al. (2014), we analyzed the contribution from track B post year 1999 and compiled it into table 6.

Table 6. Factors influencing organizational creativity from track B post 1999

Individual characteristics (Individual)	<ul style="list-style-type: none"> • Role breadth self-efficacy (Axtell et., 2000) • Production ownership (Axtell et., 2000)
Job context (Individual)	<ul style="list-style-type: none"> • Problem solving demand (Axtell et., 2000) • Individual method control (Axtell et., 2000) • Machine maintenance (Axtell et., 2000) • Job complexity for creativity (Mainemelis & Ronson 2006)
Process (Team)	<ul style="list-style-type: none"> • Participation (Axtell et., 2000) • Participative safety (Axtell et., 2000)
Team structure and composition (Team)	<ul style="list-style-type: none"> • Team method control (Axtell et., 2000) • Team role breadth (Axtell et., 2000)
Culture (Organizational)	<ul style="list-style-type: none"> • Open flow of communication (Mcklean, 2005) • Freedom and autonomy (Mcklean, 2005) • organizational encouragement (Mcklean, 2005)
Resources (Organizational)	<ul style="list-style-type: none"> • Time and space for creativity (Mainemelis & Ronson 2006) • Time and money allocation, other scarcity of resources (Mcklean, 2005)
Structure & strategy (Organizational)	<ul style="list-style-type: none"> • Suspending ordinary convention, structural obligation and functional pressures (Mainemelis & Ronson 2006)
Environment (Organizational)	<ul style="list-style-type: none"> • Environmental treat (Mainemelis & Ronson 2006)
Leadership (Organizational)	<ul style="list-style-type: none"> • Leader emotional intelligence (Zhou & George, 2003) • Appraisal and expression of leaders (Zhou & George, 2003) • Team leader support (Axtell et., 2000) • Transformational leadership (Gumusluoglu & Ilsev, 2009)
Management (Organizational)	<ul style="list-style-type: none"> • Management support (Axtell et., 2000) • Support for innovation participation (Axtell et., 2000) • Active management vs. regulatory process (Bledow et al., 2009) • Managing conflicting demands (Bledow et al., 2009) • Supervisory encouragement (Mcklean, 2005)

5. Connecting the two tracks

The analysis of the paper shows that bridging the gap in the organizational creativity literature requires track A, which has evolved into the dynamic componential model (Amabile and Pratt, 2016), to be integrated with the factors from track B, compiled into table 6. To connect tracks A and B, we therefore used the compiled list of factors to identify which elements from track B were lacking in track A, represented by the evolution into the dynamic componential model and how they could be integrated into the model (Amabile and Pratt, 2016). The factors are organized at the individual, team, and organizational levels to have a systematic approach for the discussion.

5.1 Factors at the individual level that can contribute to the dynamic componential model

The dynamic componential model does not consider production ownership (Axtell, 2000), but this factor could inform the use of the model if taken into consideration as an additional element in the discussion of work orientation (cf. Amabile & Pratt, 2016; table 3, pp. 172). Likewise, the factors of role breadth self-efficacy could be connected to skills in the task domain, as similar factors are already discussed (Amabile & Pratt, 2016; figure 1, pp. 161). Furthermore, the factor of job complexity for creativity (Mainemelis & Ronson, 2006) is lacking in the model, but could be connected to the organizational component C, which describes the necessary organization of work having an absence of unnecessary layers of hierarchy and bureaucracy in the organization (Amabile & Pratt, 2016; pp. 162).

However, the factors of problem solving demand, individual method control, and machine maintenance are already considered in Amabile and Pratt (2016), albeit based on different authors than the ones we identified in track B.

5.2 Factors at the team level that can contribute to the dynamic componential model

Participation involves the degree to which the employees perceive they have influence within the team and organization, e.g., regarding goal-setting, long-term plans, work processes, etc. (Axtell et al., 2000). This factor could be connected to the dynamic componential model's organizational component C, as it relates to the way resources such as individuals with the right expertise are participating in the creative processes. Likewise, the factors of team method control, i.e., the control the team has over its own work and processes etc. (Axtell et al., 2000), and team role breadth, i.e., the degree to which the team can allocate tasks among team members without being confined by narrowly defined team roles (Axtell et al., 2000), could also be connected to the dynamic componential model's organizational component C as it relates to the way people are organized.

The factor participative safety (Axtell et al., 2000) however, is already included in relation to psychological safety (Amabile & Pratt, 2016; pp. 168).

5.3 Factors at the organizational level that can contribute to the dynamic componential model

Mcklean (2005) stresses the necessity of open flow of communication, as well as freedom and autonomy. These factors are mentioned by Amabile and Pratt (2016) as organizational component c, skills in innovation management, but in the earlier paper categorized as organizational component a, motivation to innovate (Amabile, 1988). Mcklean (2005) furthermore argues that organizational encouragement such as reward and recognition, as well as time and money allocation and other

scarcity of resources is important, which are already discussed in organizational components a, b, and c.

Mainemelis and Ronson (2006) describe how time and space, such as engagement in play, can contribute to organizational creativity, e.g., by producing ideas or through improvisation to allow divergent thinking during the innovation process. This factor is not clearly discussed in the dynamic componential model. Time and space for creativity could be considered in the organizational component c, or as an activity in the idea generation stage. Mainemelis and Ronson (2006) also describe how organizational structure and strategy can inhibit creativity, making it necessary to suspend ordinary convention, structural obligation, and functional pressures to facilitate creativity in organizations. These insights are not discussed in the componential dynamic model, although they can be related to the point about autonomy in how to meet project goals (cf. Amabile & Pratt, 2016; table 2, pp. 169). Finally, Mainemelis & Ronson (2006) discuss environmental threats, which is already present in the dynamic componential model.

Leaders' emotional intelligence describes their ability to effectively reason about emotions and use emotions to aid cognitive processes and decision making and reflects the ability to understand and manage emotions and their interrelations with cognition both in self and others to enhance effective functioning (Zhou and George, 2003). Based on four primary dimensions of emotional intelligence, appraisal and expression, use of emotions, knowledge of emotions, and management of emotions, leaders' emotional intelligence influence organizational creativity. This factor arguably plays a crucial role for both individuals and for collective processes but is not discussed in the dynamic componential model. This insight could be captured by expanding either the individual component C or the organizational component C deeming them skills in innovation management, but would require a better and more concise definition of organizational component C.

Axtell et al. (2000) describe how team leader support can facilitate creativity. Gumusluoglu & Ilsev (2009) expand this discussion by studying how transformational leadership influence creativity at both the individual and organizational levels. Bledow et al. (2009) discuss how actively managing dialectic tensions in a system enable organizational creativity by helping to cope with conflicting activities, e.g., to encompass both creative experimentation and standardization of core processes. Furthermore, to meet the demand of innovation, the systems need to be managed in a way that values and performs a variety of different and partially conflicting activities such as exploration and exploitation, i.e., organizational ambidexterity (Abernathy, 1978; Benner & Tushman, 2003). Amabile and Pratt (2016) discuss the role of leadership through a lens of work environment where they highlight how local leaders have higher influence on creating oases for creativity or inhibiting creativity through abusive behavior. However, the model lacks a fundamental conceptual discussion of leadership, which is barely mentioned in the paper.

5.4 Connecting the two tracks

The literature of the two tracks can be connected by integrating the factors from track B into the dynamic componential model as described in the previous sections. For most of the identified factors, the connection can be established merely by adding the factors into the model and discussing them in relation to the existing knowledge presented by Amabile and Pratt (2016).

However, for some factors identified in track B, the theoretical insights do not easily fit into the model. The organizational component C seem to be a container of the residual insights, but lacks a conceptual framework or more theoretical foundation, e.g., from organization theory. This means that the many useful insights are piled together, creating a black box inhibiting theoretical discussions about organizational structure, organizational processes, leadership, and management. Even the

table overview (Amabile & Pratt, 2016, pp. 169) compiles elements as different as project goals, frequent feedback, open idea flow, participative decision-making, and reward systems into the same category of skills in innovation management.

Based on the findings of this paper, the track B literature arguably highlights that organizational component C needs be expanded with a systematic and conceptual model. This conceptual model could be inspired by Hansen and Møller (2016) who present a work system model and an improvement system model that in a systematic way could embrace and categorize all the presented insights from track B, e.g., organizational structure, processes, and leadership.

Future research also needs to expand the theoretical and conceptual understanding of leadership, which could be inspired by the complexity leadership theory (Uhl-Bien & Arena, 2018).

Furthermore, Anderson et al. (2014) highlight that management-related factors, knowledge utilization and networks, structure and strategy, culture and climate, and innovation diffusion needs further studies since they are lacking in the studies of organizational creativity. This point is further stressed by Akhavan et al. (2016) who argue for the need of more studies of network, structure, and strategy in the organizational creativity field.

6. Implications for managing creativity in organizations

The paper highlights the need for expanding the understanding the implications for managing creativity in organizations in terms of the organizational structure, processes, and leadership, etc. In this section, we will expand this component based on the identified literature from the bibliometric study.

6.1 Managing creativity through organizational settings and structure

Mainemelis & Ronson (2006) suggest that jobs should be designed with enough complexity to enable creativity, a point that is also stressed by Oldham and Cumming (1996) who show that jobs with high simplicity and routine jobs reduce creativity, whereas encouraging employees to focus simultaneously on multiple dimensions of their work increases organizational creativity. This means organizational structure and jobs needs to be designed with high levels of autonomy, skill variety, identity, significance, and feedback. This can also be achieved by allowing employees to focus on multiple dimensions of their work (Oldham and Cumming, 1996). Furthermore, Liu et al., (2019) show that setting role expectations for creativity such as explicitly incorporating creativity in job description or clearly communicating employee's outputs are an effective way to boost employee creativity.

In terms of team composition, members need to have different backgrounds and different expertise (Hargadon & Becky, 2006). The organizational settings need to enable reusing knowledge in new situations to allow teams to find new solutions to problems. This point is further supported by Woodman et al. (1993) who shows how group composition, process and characteristics and group structure are considered as main drivers of creativity. Furthermore, the teams need to have control over its own work and processes, etc. (Axtell et al., 2000), as well as the ability to allocate tasks among team members without being confined by narrowly defined team roles (Axtell et al., 2000). In practice, organizational models that enable more autonomy to teams can be inspired by the tradition of socio-technical design (Cherns, 1976) that has also inspired the description of Lean organization (e.g., Liker, 2004), or elements from the more recent and extreme holacracy (Bernstein et al., 2016).

6.2 Managing creativity through organizational processes

The dynamic componential model emphasizes the point from Hargadon and Becky (2006) about how momentary collective processes can generate creative solutions and reframe past experiences of the participants in ways that lead to new insights. This can be implemented in practice through participation where employees have influence within the team and organization, e.g., regarding goal-setting, long-term plans, work processes, etc. (Axtell et al., 2000). Furthermore, these collective processes can be facilitated through staging of play, e.g., as described by Mainemelis and Ronson (2006) of how time and space, such as engagement in play, can contribute to organizational creativity, e.g., by producing ideas or through improvisation to allow divergent thinking during the innovation process.

A way of continuously improving the organizational settings, structure, and processes for innovation is the establishment of a second order improvement system (Hansen & Møller, 2016), which enables systematic second order dynamic capabilities for improving the ability of the organization for organizational creativity and thereby innovation management and innovative outcomes. By ensuring the right improvement strategy is in place, organizations can prioritize how to continuously improve their improvement capability, also by actively selecting the right innovation tools and approaches, for example appreciative inquiry or problem solving (Hansen, 2015).

The organizational innovation processes can be supported by are idea management systems (Sandstrom & Bjork, 2010), which can be IT-based or be simple and visual, used directly where the job is being done. Innovation handbooks that provide guidance on how to systematically follow the innovation processes can also be institutionalized, for example based on the dynamic componential model (Amabile & Pratt, 2016).

Rother (2010) and Scott et al. (2004) provide detailed descriptions of how organizational processes of systematic training systems for creative problem solving can be carried out, even at the shop floor to improve innovative outcomes. Hansen and Møller (2016) further add how this systematic understanding of creative thinking requires the right organizational support systems to function optimally.

6.3 Managing creativity through leadership

Oldham & Cumming (1996) describe how leadership behavior needs to be supportive and non-controlling to support creativity. This finding is supported by Axtell et al. (2000), who describe how team leader support can facilitate creativity. Zhou and George (2003) expand this by introducing leaders' emotional intelligence and how it aids the creative processes. In practice, this means that leadership needs to actively manage the work climate, culture and environment to enable employees to submit new ideas in a safe and encouraging environment. Edmundson (1999) describes in more details how psychological safety influences a team's innovative outcomes and how to increase psychological safety. Another well-known leadership approach to utilize is transformational leadership, which Gumusluoglu & Ilsev (2009) discuss by studying how transformational leadership influence creativity at both the individual and organizational levels.

Bledow et al. (2009) discuss how actively managing dialectic tensions in a system enable organizational creativity by helping to cope with conflicting activities, e.g., to encompass both creative experimentation and standardization of core processes. Uhl-Bien and Arena (2018) introduce the notion of adaptive space, which gives a conceptual understanding of the leadership processes necessary to cope with the tension of complexity and conflicting interests in a system.

One way of actively managing complexity and these tensions is the use of guiding language or metaphors that can help teams find new innovative solutions and overcome the conflicting processes that complex challenges can induce (Hansen & Lilja, 2021). Probst et al. (2011) present elements from ambidextrous leadership that can also inform leaders about how to cope with the conflicting challenges of simultaneously exploiting and exploring.

7. Conclusion

The paper analyzed the organizational creativity literature through a bibliometric review from 1980 to 2020. The analysis shows that the extant literature of organizational creativity in 2000 diverged into two tracks that consist of influential conceptual models of organizational creativity, which have not been integrated in the literature. The paper contributes to this literature gap by connecting the two tracks through analyzing factors from one track that were then integrated into the other track. Furthermore, the paper suggests implications for practitioners based on the learnings from analyzing the two tracks.

The bibliometric analysis has the limitation that the data was only based on Web of Science, while a few studies had to be added manually from other databases, meaning the TLCs could be influenced with a larger data source. Also, the conceptual analysis only included the 20 most cited articles. We acknowledge that an expansion might potentially highlight interconnections between the two tracks, not uncovered by our analysis.

The findings of the paper encourage future research to expand the theoretical discussion of organizational component C in the dynamic componential model. Furthermore, a theoretical and conceptual understanding of leadership needs to be developed and studied in order to uncover the role for organizational creativity.

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