

Approaching the creative process as a complex adaptive system

A abordagem do processo criativo como um sistema adaptativo complexo

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ABSTRACT

This article proposed as a general objective to understand whether creativity, in a process approach, can be understood as a complex adaptive system, in the perception of professionals in creative areas, regarding the processes inherent in the management of fashion products, who work in companies in the leather-footwear sector located in the region of Vale dos Sinos. Seven semi-structured interviews were carried out with the target audience, from five companies, as detailed in section three. Regarding the approaches brought by the contributions of complex adaptive systems (CAS), which find similar characteristics in creative and innovative organizations, it was possible to conclude that there are opportunities for the researched environments to explore, in more depth, such approaches, which understand that the Organizations are not just the sum of their components (agents), but also the result of the intricate relationship between these components. Recognizing the complexity inherent to the creative process of organizations, understanding the interrelationships, and the interdependence between the subjects and elements involved in these interactions, can contribute to rethinking new alternatives and management strategies.

Keywords: Footwear design. Complex adaptive systems. Creative process. Creative industry.

RESUMO

Este artigo propõe como objetivo geral compreender se a criatividade, numa abordagem de processo, pode ser entendida como um sistema adaptativo complexo quanto aos processos inerentes à gerência de produtos de moda, na percepção dos profissionais de áreas criativas que atuam em empresas do setor coureiro-calçadista localizadas na região do Vale do Rio dos Sinos. Foram realizadas sete entrevistas semiestruturadas com o público-alvo de cinco empresas. No tocante às abordagens trazidas pelas contribuições dos sistemas adaptativos complexos, que encontram características semelhantes em organizações criativas e inovadoras, foi possível concluir que há oportunidades para os ambientes pesquisados explorarem, de forma mais aprofundada, tais abordagens, as quais entendem que as organizações não são apenas a soma de seus componentes (agentes), mas também resultado do intrincado relacionamento entre esses componentes. Reconhecer a complexidade inerente ao processo criativo das organizações, compreendendo as inter-relações, interdependência entre os sujeitos e elementos envolvidos nessas interações, pode contribuir para repensar novas alternativas e estratégias de gestão.

Palavras-chave: Design de calçado. Sistemas adaptativos complexos. Processo criativo. Indústria criativa.

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INTRODUCTION

One of the greatest challenges for organizations has always been and still are to seek ways to boost performance and, thereby, their competitiveness in the market. For Drucker (1999), as we advanced further in the knowledge economy, most of the basic assumptions about economics, business, and technologies have become outdated. In this sense, Stacey (1996) states that it is important to recognize this complex context in the studies of organizations.

Complexity occurs when the components that constitute a whole, economic, political, sociological, psychological, affective, or mythological aspects, are inseparable and there is an interdependent, interactive, and inter-retroactive fabric between the parts and the whole and between that whole and its parts (MORIN, 2000). For Stacey (1996), there are consistent explanations that relate both creativity and innovation to the complexity theory. Understanding the new paradigm within organizations in the light of these theories is a proposal that can assist in the studies on organizations (STACEY, 1996; MORIN; LISBOA, 2007; PONCHIROLLI, 2007).

In the creative industry, creativity is the main raw material. From an economic perspective, the fashion sector seeks differentiation in its performance in relation to the market, with more frequent product launches and new proposals for use and characteristics, including demands to serve specific niche markets (TREPTOW, 2013). Taking this into consideration, the overall objective of this article is to understand the approach to the creative process as a complex adaptive system, from the perspective of creative professionals who work in companies in the leather-footwear sector located in the Vale do Rio dos Sinos region (state of Rio Grande do Sul, Brazil).

The Vale do Rio dos Sinos region is a strong regional hub for the leather-footwear sector (SCHNEIDER, 2004), but the region has suffered from exports and competition from countries, such as China, since the 1990s, losing space in the market and going through a delicate crisis (CONSINOS, 2017).

After this introduction, the article presents the conceptual bases related to the influence of complexity on organizations and types of creativity and its interpretation as a process. Next, the methodological procedures are detailed, and in the following subtitle, the analyses and discussion of the results. After presenting the researched corpus, the final considerations regarding the objective, contributions, limitations, and suggestions for future investigations are described.

THE INFLUENCE OF COMPLEXITY ON ORGANIZATIONS

Organizations and people are open and complex systems. They are, therefore, dynamic systems that are related to and influenced by one another (KATZ; KAHN, 1975; STACEY, 1996; MORIN; LISBOA, 2007). According to Palmberg (2009), a complex adaptive system is a set of interdependent agents that form an integrated whole in which an agent can be a person or an organization. It is a system in which many elements or agents interact, leading to emergent results that are often difficult to predict when simply observing the individual interactions present.

For the author, the characteristics of complex adaptive systems are:

- interdependence of agents, because each part of the system can affect the behavior and priorities of the other;
- self-organization, which arises from chaos and from which the capacity to create order emerges;
- nonlinearity, considering that there are varied dynamics, connections, and interactions that are nonlinear;
- adaptability, which deals with the ability to learn from your own experience and adapt to new and unexpected conditions.

In addition, evolutionary systems are considered to be:

- emergent, in the sense of a process whereby the properties of the whole emerge from the parts of that whole;
- not predictable in detail, as there is no predictability in things, because of the interdependence and nonlinearity of the agents in the system.

However, it is possible to find order amid the chaos. A system is still coevolutionary, because the actions of the agents affect others, and the organizations act and react in cooperation and competition with other agents — that is, the agents do not act on their own; and finally, in a system there is distributed control, in the sense that there is no hierarchical central authority in one agent. In other words, there is control, but there is no one in control.

Regarding complex adaptive systems approaches, Palmberg (2009), seeking to assist with management, defined seven approaches:

- Vision: to create a shared vision that provides minimum specifications for the future use of organizations, encouraging them in terms of flexibility, adaptability, and creativity and allowing agents to be more active;
- Simple rules: to establish and communicate simple and clear objectives and principles that will generate complex and intelligent behaviors. Many rules and regulations make things more complex, but behaviors become more limited and expected;
- Attractors: to include in the system any component that is stronger than the existing ones, in order to allow further evolution of the system;
- Diversity and tension: to create an environment of healthy tension, using management skills to maintain balance between this tension, instability, and the created stress. Both tension and diversity (different profiles of individuals) are necessary ingredients of creativity;
- Experimentation and reflection: to act and learn from experience, instead of planning, getting the feeling that what is most planned will bring more certainty for the future;
- Pieces or parts: to begin with complex problems, analyzing their parts, identifying what works. Based on this, to link other parts and discard what does not work;
- Feedback: to feed information to agents that carry out the actions, so that they have the opportunity to improve and gain greater autonomy.

In the approaches proposed by Palmberg (2009), there are great similarities with management practices adopted by companies that have more open, creative, emerging, and less traditional management.

Stacey (1996), at the organizational level, makes contributions with regard to creativity, explaining the interaction between people within a group in a nonlinear feedback system. This individuation-conformity dynamic allows the person to be oneself and also to feel part of the group. As this is the operating condition of the group, all members become highly conformists, and the group enters a stable zone. Conversely, if all members abandon conformity for their own individuality, the group disintegrates and moves to the unstable zone. It is at this moment that the group opens space to be creative, but the tension between these two states (conformity and individuality) must be contained. Thus, in a group, creativity takes place in a space of transition between the stability and the instability of the system. This notion corroborates that of Maturana and Varela (2001), when stating that the moment when a system becomes disorganized is when it has reached its limits. In other words, this moment concerns how much the system tolerates before a structural change occurs.

CREATIVITY AS A PROCESS

Although it is not possible, in addition to being pretentious, to delimit a single perspective of what creativity is, for its use, it should be noted that this article aims to investigate the influence of the organizational environment on the creativity of individuals. Amabile et al. (2005) emphasize that creativity can be encouraged, in working groups, through autonomy, openness to ideas, and stimulus to creativity, in addition to sharing objectives and the possibility of challenges, which generate collective commitment.

According to Caniëls and Rietzschel (2015), organizational creativity results from the individual creative behavior, which comprises a complex interaction between the individual and the environment. Manenti (2013) highlights that creativity is related to the generation of new ideas and has a useful nature, which generates value. Group creativity derives from individual creative behaviors, the interaction between individuals, the characteristics of the group, and processes, in addition to contextual influences.

Stacey and Griffin (2005) add that an individual can impact collective creativity. Creativity, therefore, can never be considered an individual process, as it involves interaction with other people in a group. Thus, it can be analyzed from the perspective of a process.

From the perspective of using creativity for solving problems and with a process perception, Amabile (1988) explains, based on the individual conceptual model, the stages from the initial presentation of ideas to the solution. Fabun (1969) proposes similar stages of the creative process, understanding creativity as a process in juxtaposition, something that is reversible when applied to knowledge. In terms of representation, it is like a concept established in the mind (and all the things that

influence it, which is why there is a complex relationship), which, combined with another concept already established in the mind (similarly complex), will form something different, the new idea.

In this sense, Amabile (1988), Baxter (1998), Amabile et al. (2005), and Sternberg (2006) corroborate this notion: in order to generate new ideas, prior knowledge is necessary. The creative process is explained by several authors (FABUN, 1969; AMABILE, 1988; BAXTER, 1998; GOMES, 2001; AMABILE et al., 2005) from different lines of thought.

Overall, some formulations have more stages than others or have different names; some address the subject by considering more artistic contexts; and others are more focused on organizational contexts. In general terms, however, the process takes place in a similar way for these authors. According to Ostrower (2014), regardless of the field of knowledge, whether science or art, creativity, as a potential, and creation, as the achievement of the potential, are manifested in human beings in an identical way, in a way that is unrelated to the specific paths they will follow in the fields of knowledge.

The process takes place in stages, the first of which is the identification of the problem. The second consists of preparation, in which the individual seeks information to solve the problem. In the third, called idea generation, the level of originality of the product or response is determined. At this stage, the individual creates several response possibilities, making use of the relevant creative processes and their intrinsic motivation. Subsequently, there is the validation of the idea, the moment to present the idea or product. The last stage, the analysis of the results, is decision-making regarding the response, based on the evaluation of the previous stage. In the end, if the idea has solved the problem, the process is ended. The same occurs with a negative result. Nonetheless, if the result is partial, the process returns to the previous stages, using experience as learning, representing progress towards the solution.

The qualitative approach and field research strategy were chosen, considering their exploratory nature. Data were collected by semi-structured interviews and were analyzed using discursive textual analysis.

METHOD

To carry out the research, the authors chose the qualitative approach and the field research strategy, considering their exploratory nature. Bauer and Gaskell (2002) define qualitative research as a strategy that generates data for a more in-depth development and understanding of beliefs, attitudes, and values, in terms of people's behavior in social contexts. Gil (2002) corroborates this classification, stating that this type of research brings researchers closer to a given problem, aiming at analyzing the phenomenon in a more explicit way.

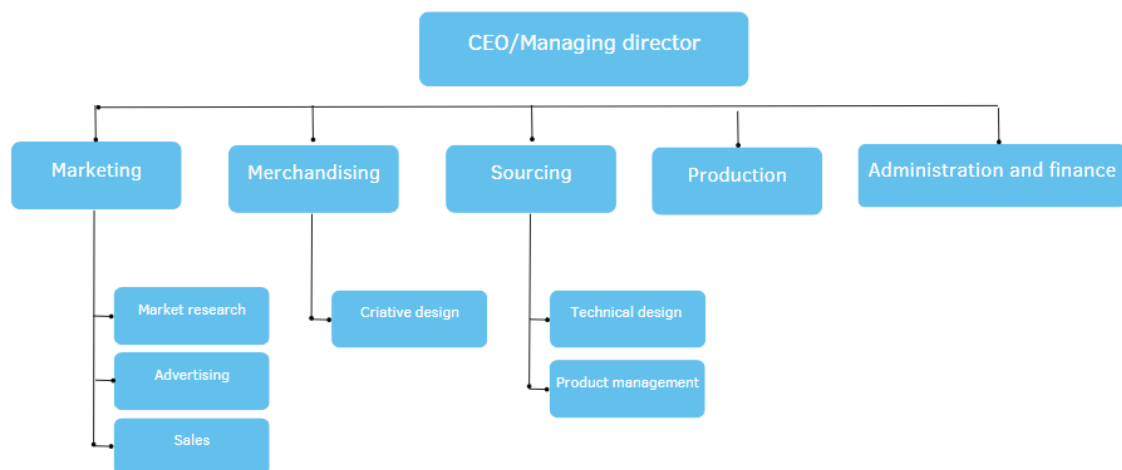
Data were collected by semi-structured interviews, with questions such as follows: how does the product creation process take place in the company? If you had to establish stages for the creative process in the company, what would they be and

what would occur at each stage? How do you perceive the participation of other sectors in the organization’s creative process? How does this interaction take place and with whom? What do you suggest that could be done in the sector or organization that could facilitate/stimulate the creativity process?

For the interviews, the authors selected professionals from five different companies in the leather-footwear sector in Vale do Rio dos Sinos region, in the state of Rio Grande do Sul, Brazil, by non-probability, intentional, and convenience sampling, using criteria of accessibility and availability of time of the interviewees.

Companies in this segment, medium and large, in the researched region, are similar in their organizational structure, in the areas called creative, which here are directly linked to the creative process for developing fashion footwear. For this research, the authors sought for the perception of two audiences in this context. One of them are managers (product, style, or innovation manager or coordinator), who are responsible for the entire process of developing and preparing collections, according to trend research, definition of fabrics, color and material chart, and briefings. They also approve the stages of the process and maintain contact with suppliers until final approval. In addition, the authors sought for the perception of what we have adopted as a category called “creative,” namely a professional with expertise in the creative field of footwear development process, who may be a stylist, a fashion designer, or a product designer.

According to the organizational structure, represented in Figure 1, proposed by Costa (2013), the target audience is among the areas of merchandising and sourcing.



Source: adapted from Costa (2013).

Figure 1. Organizational structure in the apparel industry.

In total, three managers and four creative professionals were interviewed, from a total of five companies in the segment.

E1 is the style manager of one of the brands of company A, which serves several female audiences with a focus on the creation of footwear and bags. She currently

coordinates three stylists and one assistant. E2 is a stylist of footwear, bags, and belts for one of the brands of company B. E3 is the person in charge and product designer, and carries out administrative activities due to the limited structure of company C. Based on E3's 20-year experience in the footwear market, the professional answered the questionnaire aimed at creative professionals. E4 is a product manager at company D and has worked in relevant companies in the fashion footwear segment, whose functions ranged from product design to technical functions such as engineering and production. E5 is a stylist of E1 at company A, that is, she is an employee of E1. E6 is the innovation manager at company E, which focuses on technology in leather, footwear, and products. E7 is a stylist in the same organization (company A) as E5, with E1 as manager.

The scenarios and the distribution by categories to differentiate the target audience are shown in Chart 1.

Chart 1. Interviewees' profile.

Interviewee	Job	Time working at the company	Career time (year)	Category for research
E1 (company A)	Style coordinator	2.5 years	18	Management
E2 (company B)	Stylist	5 years	35	Creative
E3 (company C)	Product designer	6 years	20	Creative
E4 (company D)	Product manager	4 months	35	Management
E5 (company A)	Stylist	1 year	9	Creative
E6 (company E)	Innovation manager	1.2 year	10	Management
E7 (company A)	Stylist	1.1 year	15	Creative

Regarding the data analysis strategy, textual discursive analysis proposed by Moraes (2003) was chosen, as it disregards the neutrality of the discourse and considers the subjectivity of the environment. In this sense, based on the interviews, according to Moraes (1999), the discourses were decomposed into units of meaning, which was concluded with the deconstruction of the texts. This process resulted in the analysis unit "the creative process," which formed two categories of analysis: "the role of professionals in creative fields" and "complex adaptive system."

DATA ANALYSIS

Based on the analysis of the discourses, we identified the way in which the creative process takes place in fashion footwear companies in the researched region and, therefore, we highlighted the theory proposed by Rech (2002), who states that fashion, in terms of performance, is characterized as industrial design, considering the commercial and industrial implications in its activities and also because this process, in the end, generates the fashion product, in this case the footwear collections. However, in addition to this perspective, there is the fact that this process is neither

linear nor constant, but rather presents characteristics of complex adaptive systems, according to analyses and evidence that will be better investigated next.

The role of professionals in creative fields

The segment uses a process with very similar methods to transform ideas into products, but some companies focus more on the creative process itself, with creative personnel not involved in the development of competition studies and other marketing studies, as there are specific areas for this purpose. As highlighted by E1: *"I say: look, it's started, each of you do your research and there will be a day when everyone will show it, develop it, and point out to me what each one wants, and then we will consider the best from each one, ok? But together, you know?"*.

Conversely, other companies demand greater breadth of their duties from designers (SAYEG, 2015). In addition to creative production, they must be very involved in the sales/pricing process, engineering and/or prototyping of future footwear, as highlighted by E3:

I have to present a very well-structured framework collection, in which there will be the investment that the factory will have to make in this collection, how much will it spend to create this collection. If you have a new sole, you must have an entire mold made, it's costly. The existing sole is another cost. I have to consider all that cost, the average price of the collection.

This statement is corroborated by Sayeg (2015), who states that the creative team works with cost limits and predefined production capacity.

Throughout the next category, it is possible to identify the relationship between the complex adaptive system, in the result of the work carried out by professionals in the creative fields, and a summary chart at the end of the section.

The complex adaptive system

Regarding the creative process, we can observe that it presents characteristics of a complex adaptive system (STACEY, 1996; PALMBERG, 2009) in some aspects. However, it was identified that organizations can further explore, in their organizational systems, the approaches from Stacey (1996) and Palmberg (2009) as a way of enhancing creativity, providing greater fluidity and autonomy to people and, consequently, to the process itself and its surroundings, whether internal or external.

However, by understanding the organization as a system, it is necessary to create greater destabilization to provide greater creative space. Such analyses could be identified in the speech of E2: *"It's not a creative universe with extreme, you know, freedom to have all the ideas, it isn't, right? We have to be within one [context], encompassed within the context of a brand."* This was further reinforced by what E3 highlights:

It's quite challenging, because we really have [to do it], we can't just be daydreaming. We have to propose new things. We have to dream. We have to innovate, but at the same time we cannot be completely excluded

from the possibility of providing a good financial return to the factory and to all employees, you know?

We identified that the creative process — while a smaller open system — in the organization — while a larger open system — does not present constant balance as a characteristic. This is evident because, with each interaction experienced in this system, the process takes another direction and creative intensity. The interdependence between all areas and the specialists that compose each part of this system may affect the behavior and functional priorities of the other, influencing the phenomenon of creativity, as stated by E6:

When there's too much interaction, the productive sectors tend to give too much opinion on creation and simplify too much or limit the creative capacity and innovation. Why? The creative area, I mean, the production area, always focuses on productivity, on the production volume, in such a way it tends to reject all creative ideas that differ from this pattern.

There are several components of this system that influence behaviors, such as the desire of the final consumer, as identified by E7 — *"The projects came through marketing needs... Not so much of a spontaneous type, so it always came from a market need"* — and E4 — *"Brazil has the capacity to do so, but it doesn't, because consumers themselves expect to see what everyone is using, a famous person in the USA, what everyone is using in Europe to copy it and use it the same way. Consumers are already like that, ok?"*.

Fashion cycles, called sell-in, place a lot of pressure on work, as can be identified in the statements of several interviewees, summarized in E5's speech:

This sell-in calendar, which is the sales calendar, is what rules the life of the company, and this calendar is very... you know, fast, right? So, it's this calendar that allows us to have one collection per month, sometimes more, here we have 14, 15 collections/year... It's really quite fast. It makes us have to work very quickly and at the expense of the creative process.

Furthermore, there are the industrial characteristics of the leather-footwear sector in the researched region. The footwear crisis is mentioned by several interviewees, especially managers, as a strong indicator that keeps companies stuck to a more traditional industrial mentality. They are unable to get out of this process, which was summarized by E6 as the company that develops by looking at store windows, producing, selling, and earning. For him, there is a need for companies in the region to change their mindset, to stimulate innovative processes (TIDD; BESSANT; PAVITT, 2015), to think ahead, reformulating their work structures and their way of managing business (SOUZA; PAULA; FUCK, 2012; ABICALÇADOS, 2018).

Thus, the interference of the external environment in relation to the organization is identified, in addition to all the internal interferences inherent in the organizational culture, which present both elements that help promote creativity and elements that hinder this promotion.

Nonlinearity, presented in characteristics of the complex system, evidenced in this dynamic by constant interactions, as explained by Stacey (1996), Morin (2000), and Palmberg (2009), generates specific results that are not predictable. This does not mean that the more creativity attributed to a product or process, the more chances of results it will have. This statement can be noticed when identifying the filters in the organizational structure according to which ideas must be considered to become products, as highlighted by E1:

A shoe factory is a business that depends on many people. So, triggering this is a very complex process... And we depend a lot on third-party suppliers, who deliver the raw material for the upper, the raw material for making an ornament. So, there's all that, it has to be coordinated, right, to work on schedule.

E3 also mentions the various sectors involved in creation, demonstrating a nonlinear process: *"Participation takes place through a product committee, ok? [It is] Composed of key people from each area and department. So, there are several people who listen to and also contribute to the development of the collection with the new products."*

It should be noted that, at each stage of the development of new products, even though there is no linearity in this dynamic, it is still possible to find ordered patterns and, more than that, these must exist. Ordered patterns exist, for example, at each new stage of the process, in which it is necessary to carry out a kind of inspection to ensure that things are as expected. Apparently, these moments are incorporated as standard practices adopted by companies to monitor the progress of the collections, which results in a process of self-organization (PALMBERG, 2009), which is established in an initial disorder, inherent in the early stages of the creation process. At the end of the creative process, there is a new order, which is the final collection to be produced.

Adaptability is presented as a characteristic of the complex system, that is, the ability to learn from experience (PALMBERG, 2009). Making intelligent use of it aiming at flexibility and adaptation to new and unexpected conditions is evident in E2's speech: *"To be able to assess what is possible or not and how far we can go without making mistakes, or making as little mistakes as possible. We'll always make mistakes, but something more grounded at last."* E7 also mentions: *"The briefing includes several analyses, mainly concerning the sales revenue values of previous collections, what sold the most and what didn't sell."*

The constant exchange of ideas and suggestions arise from past experiences that organizations have already gone through or from previously acquired knowledge. This characteristic corroborates the individuation-conformity dynamic proposed by Stacey (1996), in which the person is oneself and still feels part of the group, in addition to making the organization learn through double-loop learning, which concerns the moment when the members of an organization alter part or all of the shared paradigm.

Among the characteristics of complex adaptive systems proposed by Palmberg (2009), there are coevolution and distributed control. Coevolution is related to the

collaboration of agents; they act and react in cooperation and, at the same time, compete with each other, generating collective evolution. This aspect can be observed from the data gathered with E7: *"We have a stage that is not that creative... It's the review [stage], I think it's very important to analyze [it]. So, we... review [it] with the engineer... Sometimes a lot of new ideas emerge from this exchange."*

Finally, distributed control was the least identified characteristic in the analyses, which can be evidenced by the statements of several interviewees who report that, at various stages of the process, they need the validation of committees (composed of managers from various sectors) to move forward, reinforcing more hierarchical work models, in which there is a lot of control and the decision is in the hands of a few people.

The practice highlighted in organizations shows a hierarchical decision-making process based on traditional management system models. In this context, organizations of the creative fashion industry, as in the case of our study, in the fashion footwear segment, could make use of adaptations in their management models to further enhance the creativity already explored in organizational environments. Organizations that aim to boost creativity still have a long way to go, especially in the sense of revisiting their assumptions regarding current management paradigms, in the development of management approaches that are more widespread among members and not centered on a few people with decision-making power and, furthermore, on the creation of organizational structures that recognize complexity as an inherent part of the business (KATZ; KAHN, 1975; STACEY, 1996; MORIN; LISBOA, 2007).

In the aspects involving management models and practices, Palmberg (2009) defined seven approaches to complex adaptive systems. Some of them could be identified in the research analyses, in the statements of some of the respondents. One of them is vision, which deals with management that creates a shared vision with minimum specifications for the future and also simple rules. Regarding this aspect, it was evident that, in the organization where E1 (manager), E5 (stylist), and E7 (stylist) work, this approach is widely adopted, as the company's chief executive officer (CEO) (who could be represented by the manager/managing director, in the organization chart in Figure 1, that is, the highest level of the organization) openly and transparently communicates the intentions of the corporation action and its goals. Hence, the group creates intelligent and collective behavior, which makes this professional to act in favor of these objectives. Thus, we verified that there is an effective contribution from several areas to the development of the collections, and not just to the execution of a project designed and validated by one sector.

One approach that was not visibly identified was the attractor, that is, a component more powerful than the others and that is inserted in the middle of the system, serving as a lever for creativity. It is believed that E6 behaves in a way that may be similar to the inclusion of attractors, as he is implementing in his organization a program of ideas and workshops to encourage creativity, with the participation of external guests who bring reflections and make people leave their comfort zone.

E2 and E5, in particular, attribute the challenge of new projects as the driving force behind their work and are motivated and encouraged by new challenges in which they may be involved.

Another important aspect when it comes to organizational environments and creativity concerns what Palmberg (2009) calls diversity and tension, one of the seven approaches to the complex adaptive system. There is a healthy tension between stability and instability, which must prevail in the system, in order to have sufficient elements to generate creativity in groups and organizations. Overall, in this sense, we observed that interviewees brought many external and internal elements to the organization that cause imbalance.

In general, it is believed that the process takes place and creativity is exercised at all levels, but it is observed, through elements — such as consumer desire, sell-ins, and the current situation of footwear companies in the researched region —, that there are more elements, especially external ones, that influence the assumptions of organizations and have effects that cause certain entropy in the system. This entropy can be verified in the fact that it is not possible to take risks in this market and end up following market patterns, considering that this is a predominantly industrial segment of the creative industry, which operates in a larger system with great competitiveness and which is embedded in a scenario of financial difficulties, which may result in stagnation and homeostasis of the system (MORIN, 2000).

Fashion footwear companies in the region, due to the constant crisis they are undergoing, do not have time to stop, create solutions, innovate business models, and thus open up possibilities with new markets. E6 (style manager) states that if companies were able to do so, they would enter into a virtuous and prosperous cycle. What E6 says is, for Maturana (1999), the concept of an autopoietic system, that is, it refers to the capacity to self-organize and self-produce, to sustain oneself (MATURANA, 1999; MORIN, 2000).

An approach to complex adaptive systems that has become quite evident, in general, is the ability to learn from experience, whether positive or negative. All interviewees state that much of what they do today comes from learning and knowledge acquired throughout their journey, and it is also noteworthy that organizations absorb much of this knowledge, constantly feeding them back.

Finally, feedback concerns the action of providing constant returns to agents who execute actions in the system. The evident constant interactions of creative professionals with many fronts of the organization, who always show openness to suggestions and possibilities for improvement, demonstrate that this approach is a common practice in all organizations, according to the interviewees.

FINAL CONSIDERATIONS

All complex, social, cognitive, and biological systems move towards uniqueness; however, at the same time, they seek integration aiming at maintaining the continuity and stability of the system in question. This cyclical and continuous movement of differentiation and integration promotes the maintenance of a

healthy system and its growth. For the present study, regarding the approaches brought by the contributions of complex adaptive systems, which find similar characteristics in creative and innovative organizations, we concluded that, in the studied object — namely the creative process for developing fashion footwear —, there are opportunities for the researched environments to explore, in more depth, such approaches, understanding that the organizations are not just the sum of their components (agents), but also the result of the intricate relationship between these components.

We identified that the system exhibits, in its core, the approaches of not presenting constant balance, interdependence of agents, nonlinearity, non-identification of ordered patterns, feedback, and adaptability. It is noteworthy that the latter characteristic of the complex adaptive system was found in the system, but at the same time it is not evidenced. Adaptability, which relates to learning from experience, is verified quite clearly, but when analyzed in association with a contingent characteristic, we noticed that the researched organizations, in the perception of creative professionals, could advance management models and practices to generate more creative potential.

In the light of the theories about complexity present in this study, we could also reflect on making a contribution to the research region. The systemic notion is attributed to thinking about the focus of creativity through, for example, the creative process, assuming it as a system, which means that the referred process is part of a system that is greater than the sum of the parts of the smaller system and integrated with it. Again, it is not about accumulating creativity as if it were possible to increase creativity at each stage, but rather understanding that interactions, throughout the process, result in something greater.

From the beginning, individuals and organizations suffer interference from the external environment, modifying the parts. Moreover, in this interaction, aspects of organizational culture (the social system), which will stimulate or discourage creativity, can be integrated and articulated. In the other environment organizations, as parts of the same system in the region where the research was carried out as another, broader part, it was possible to recognize the existence of an interdependent, interactive, and inter-retroactive fabric between the parts and the whole and between the whole and its parts, which constitute economic, political, sociological, and psychological aspects in an inseparable way.

At the end of these considerations, it should be noted that the main contribution of the present study is to propose the exercise of a multidisciplinary, diverse, and cross-cutting perspective of creativity in organizations. It is noteworthy that our real challenges, within and outside organizations, are increasingly based on multidisciplinary, cross-cutting, and multidimensional problems. Thus, the study may encourage more researchers to investigate the complex bias inherent in organizations as for the topics of organizational management, seeking to assist business managers by indicating some practices that can be rethought in order to enhance creativity, interactions, and feedback between the parts and the environment.

Although achieving the proposed objective and following the methodological rigor, the existence of limitations cannot be disregarded, which in this case concerns the greater rigor of the sample of the interviewees, which was affected due to the global circumstances experienced by the COVID-19 pandemic. It should be noted that the interviewees were busy reorganizing their work routines according to social isolation measures. As a suggestion for future research, we recommend to deepen the topic that encompasses the triad organizational culture, creativity, and complexity, aiming at organizations as a study object, through case studies.

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