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Managing collective creativity: Organizational variables to support creative teamwork

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Abstract

This article explores the role of organizational variables in managing and supporting collective creativity, based on case studies developed through collaborative research projects in two industries: fashion textile design and design consultancy. The findings indicate that five distinct variables may support teams and groups in developing their (collective) creativity: a structured process, work-related team diversity, boundary openness, adequate resources, and support of relevant technology. The results provide new scientific understanding of collective creativity in organizations, and suggest future research directions, with recommendations for creative companies seeking to support collective creativity.

KEYWORDS

collective creativity, design consultancy, fashion textile design, organizational variables, teamwork

INTRODUCTION

Creativity is crucial to sustaining many organizations' innovation and competitiveness (Bilgram *et al*., 2008; Epstein *et al*., 2013), and the intensity of the global economy necessitates faster creativity in shorter cycles (Bunduchi, 2009; Sundgren & Styhre, 2003). Although "the pursuit of creativity is salient across industries and sectors today" (Seong & Godart, 2018, p. 987), it is a particularly key resource in the creative industries (Caves, 2002). As innovation in the creative industries depends on a continued pursuit of novelty, it requires the joint efforts of multiple individuals and the interplay of collective-individual levels (Jones *et al*., 2011). Thus, innovation here refers to 'an organized and an organizing activity' (Jones *et al*., 2011, p. 754), which entails collective and collaborative forms.

In this context, the fundamental interplays and paradoxes involving creativity are emphasized even further. Since creativity is far to be the simple sum of individuals' creative processes, different circumstances and contexts could support creativity as well as pose some constraints, exerting forces in different directions (Rosso, 2014; Gilson *et al*., 2019). This determines a certain variability in creativity and, in practice, creativity is not guaranteed even when some enabling conditions are present (Gilson *et al*., 2019). For example, a fundamental tension refers to the paradox that creating something novel in a continued way requires balancing and combining creative workers' freedom with stability/structure in the process (e.g., Fortwengel *et al*., 2017). Unnecessary structure can imply rigidity and inhibit creativity (e.g., Delmestri *et al*., 2005), but unconfined freedom can be counterproductive as well (Rosso, 2014). Furthermore, since "what people do creatively is intimately related to who they are" (Townley *et al*., 2009, p. 953), "creatives" might sometimes find difficult engaging naturally in creative interactions with others, for example in dealing with different viewpoints or having their creative ideas criticized (Townley *et al*., 2009). Thus, supporting creativity, especially in creative industries, involves not only providing freedom to groups of creatives but also intentionally *designing* structures and routines at the *collective* level (Cirella & Shani, 2012). The design approach to "collective creativity" presented in this study provides an important theoretical perspective on this challenge (Smith & McKinlay, 2009).

Collective creativity is crucial in creative companies, where specialists and practitioners collaborate closely to design products and services (Hoff & Öberg, 2015).

In fact, most creative ideas are outcomes of exchanges in collective spaces where interactions trigger ideas through dialogue and debate (Agogué *et al*., 2013). Catmull (2008, p. 66) observes that "in filmmaking and many other kinds of complex product development, creativity involves a large number of people from different disciplines working effectively together to solve a great many problems." How such groups are assembled, for example regarding team composition and diversity, differs widely and has various impacts on collective creativity (Cirella *et al*., 2014).

Many aspects of collective creativity are discussed in the literature, for example in relation to its outcomes (e.g., Bissola & Imperatori, 2011) and sense-making processes (e.g., Hargadon & Bechky, 2006); yet from a managerial perspective, a shared understanding of collective creativity and its determinants "remains elusive" (Slavich & Svejenova, 2016, p. 246). Despite explorations of factors triggering collective creativity (e.g., Baer *et al*., 2010; Sung & Choi, 2012), a "broader shared foundation has yet to emerge" (Slavich & Svejenova, 2016, p. 246). The managerial perspective is largely absent from research on practices to develop collective creativity (e.g., Linder & Sperber, 2017).

This study aims to: (i) investigate how members of creative teams view and define collective creativity; and (ii) identify organizational variables that support and facilitate collective creative processes that take place within groups, teams and across teams. It focuses on identifying key organizational variables relating to teamwork design that ensure balanced stability/structure in the creative process. Thus, the term "organizational variables" (or more generically "variables") hereafter relates specifically to managerially assembling, designing and gathering creative groups.

Through two case studies in creative settings (fashion and design consulting), collective creativity is explored, and five variables that support its management are proposed: a structured process, work-related team diversity, boundary openness, adequate resources, and support of relevant technology. This study therefore contributes to knowledge of how collective creativity can be developed managerially and by design in creative settings/companies, where tensions between the creative ethos and need for stability are particularly strong (DeFillippi *et al*., 2007; Musial, 2015).

Providing insights into collective creativity across creative teams, and identifying variables that promote its development will guide managers and practitioners in sustaining creativity in creative workplaces. The proposed approach, favoring the organizational conditions for collective creativity, contributes to the theory and practice around creative industries in terms of reinforcing a managerial approach in creative settings, at the same time without damaging the creative ethos (Gotsi *et al*., 2010; Lampel *et al*., 2000). In fact, this article contributes to both theory and practice by presenting a purposeful managerial approach to supporting creativity that combines creative efforts and ideals with performance and outcomes.

COLLECTIVE CREATIVITY: THEORETICAL BACKGROUND

Creativity is traditionally seen as a combination of four crucial components, the four Ps of creativity: the creative person/group, process, place/environment and product/outcome. This is a helpful way to integrate the elements contributing to creative performance (e.g. Cirella *et al*., 2014; Hoff & Öberg, 2015), and the framework outlined below adopts the perspectives of people, process and place, but does not include product because it refers to creative outcomes rather than processes. The framework elucidates the theoretical background to collective creativity in creative workplaces.

Collective creativity: People, process, place

Building on seminal works on collective creativity (e.g., Chaharbaghi & Cripps, 2007; Hargadon & Bechky, 2006), collective creativity can be applied to groups and teams, or more generally to 'micro social systems' (Quinn, 1992), nested within creative organizations and comprising individuals motivated to cooperate to reach a common creative goal. It can be defined as a purposeful set of processes and activities established by a group of individuals working in a specific environment, through which a novel idea, product, service or procedure is generated (Cirella & Shani, 2012). As this definition suggests, collective creativity can be viewed from the perspective of each determinant of the creative product/outcome. Drawing on the vast literature on team-level factors and antecedents relating to creativity and innovative team climate (e.g., Anderson *et al*., 2014; Hülsheger *et al*., 2009; Zocche *et al*., 2018), each component (people, process and place) is briefly discussed below in relation to collective creativity.

With regard to the creative person/group component, for many years the literature placed collective and individual creativity in opposition, paying little attention to the relationship between members' collective and individual contributions (Pirola-Merlo & Mann, 2004). In contrast, recent literature suggests that the two concepts give meaning to each other (Chaharbaghi & Cripps, 2007; Slavich & Svejenova, 2016; Watson, 2007). Collective creativity takes advantage of collaboration between individuals who integrate their knowledge of a concern or interest (Hargadon & Bechky, 2006). The relationship between collective and individual creativity seems to arise from a "creative synthesis" (Harvey, 2014) occurring during team processes (Watson, 2007).

A common topic in the literature on specific variables involved in assembling a creative group is team diversity (e.g., Shin *et al*., 2012), although no consensus on its impact on team creativity has emerged (Cirella *et al*., 2014), and its role in sustaining creativity seems controversial (Milliken & Martins, 1996). Various dimensions of team diversity have been considered, such as individuals' psychological characteristics (e.g., Schilpzand *et al*., 2011), functional diversity of roles, competencies and/or experiences (e.g., Bell *et al*., 2011; Mannix & Neale, 2005; Perretti & Negro, 2007), and involvement of external stakeholders with differing viewpoints and expertise (e.g., Montanari *et al*., 2016; Shalley & Perry-Smith, 2008).

With regard to the creative process, collective creativity is driven by a desire for deeper understanding, inquiry and action (Cirella & Shani, 2012). This process entails synergistic integration of knowledge and some form of learning mechanism (Catmull, 2008; Hirst *et al*., 2009), and involves developing knowledge and understanding within a micro social system to address a challenge of common concern (Chaharbaghi & Cripps, 2007). Relevant variables relate to designing structured processes for allocating tasks, activities and roles to team members (e.g., Hargadon & Bechky, 2006; Mumford, 2000; Ohly & Fritz, 2010). Some studies suggest that rigid, formal structures constrain creativity (e.g., Amabile *et al*., 1996; Rosso, 2014), whereas others propose that problem identification and well-defined tasks and activities play a crucial role in enhancing creativity (Mumford *et al*., 2002), helping team members to focus on key issues. Other studies identify specific techniques that support the creative process (e.g., Paulus & Brown, 2003).

With respect to the creative place/environment, creative teams are collective entities in which "choices and effectiveness are affected not only by the team's intrinsic features but also by the properties and behaviour of its members, as well as by the properties of the overarching social context to which they belong" (Cirella *et al*., 2014, p. 592). The organizational environment seems to affect collective creativity through organization design choices and HRM approaches (e.g., Chen *et al*., 2019), the resources allocated to the team (e.g., Chirumbolo *et al*., 2004), the physical work environment (e.g., Hoff & Öberg, 2015) and the available technology (e.g., Elerud-Tryde & Hooge, 2014; Shani *et al*., 2000).

Against this theoretical background, in adopting a managerial perspective on collective creativity, this study investigates how members of creative teams define collective creativity, and identifies variables that may support collective creativity within and across creative teams in organizations. Human resource managers, and management in general, have little power to enforce collaboration, but may adopt design choices that increase flows of ideas and knowledge within and between groups and support collective creativity.

METHODS

Data were collected from two Italian companies: Soft Silk in the fashion textile design industry, and Inde in the design consulting industry (names anonymized). Design is a key area typically included in definitions of creative industries (e.g., DDCMS, 2001). The nature and ongoing challenges of "managing creativity" in design-based creative settings suggested an appropriate fit with this study, offering an opportunity to better understand and compare organizational variables that support collective creativity. Given the fast pace of design-based settings, managing creativity to combine artistic creation and commercial/economic results is particularly relevant in this context. As the following case descriptions show, the focus on design-based settings in Italy is relevant also in consideration of their close links with clients and partners at the international, and particularly European, level.

Despite its limitations, a qualitative methodology seemed particularly suited to exploring and comparing the perceptions of the various actors involved in creative processes in different design-based settings. Thus, an exploratory case study approach was adopted (Eisenhardt, 1989; Yin, 2014) to address the aims discussed above, for its potential to generate rich insights and study dynamics in settings related to specific research interest (Ollila & Yström, 2020). This is particularly appropriate for exploring the dynamics and management of collective creativity that are present in specific creative settings (Eisenhardt, 1989; Stake, 2005). Studying two cases with different project types and differing characteristics, in terms of size, structure and culture (one larger and more established, the other smaller and more dynamic), still both intimately related to design processes, represented a theoretical sample of the phenomenon of interest and permitted comparatively study and consolidation of insights into collective creativity in design-related settings (Eisenhardt, 1989).

Case descriptions

The first company, Soft Silk, with around 120 years of history, is a top Italian firm designing and producing fabric for silk scarves and ties, particularly for the most prestigious international fashion *maisons*. The revenues for 2019 were around 100 million euro (up 10% on 2018), with 10% EBITDA and around 500 employees. Based in northern Italy, with commercial offices in New York, Paris and Hong Kong, Soft Silk targets the market segment of premium silk products, a niche in which creativity is key. The product design and development unit, which was the focus of this study, has four divisions (Womenswear, Menswear, Fashion, and Licensing & Distribution) with around 100 employees. In this unit, creative teams are brought together to work on collections for specific clients. These teams usually consist of a

product manager, a salesperson and between three and five designers. Other professionals, such as color experts and technicians, are involved as and when needed. The unit's employees are on average aged 39, with 13 years' tenure in the company (15 with more than 20 years), and most have previous experience in the same industry.

The second company, Inde, founded around 30 years ago, is an established player in Italy's innovation and design consulting industry. Based in Milan, Inde is the Italian branch of a global company, currently comprising three branches in total, that has over 200 design awards and over 300 design and utility patents. As the center for European activity, Inde has a very diverse portfolio of projects and clients. Its 25 employees are mainly designers, with a few managers. Senior designers cover project leader roles. For each new project, a creative team is brought together, including a project leader and a few designers. Each designer may be part of several different teams simultaneously. Projects usually involve two or three designers, but the size of the team is generally determined by the project's scope and duration. In this company, employees are on average aged 34, with 10 years' tenure and a wide mix of backgrounds and previous experience.

Data collection

This study formed part of a much wider collaborative research effort that adopted the principles of collaborative management research (Cirella *et al.*, 2012; Hatchuel, 2005). A joint research team was established for each company to enable in-depth collaboration, for example in selecting participants, refining the interview guide and producing shared interpretations of the results. The research team for Soft Silk comprised a research professor, two researchers, a research assistant and three practitioners from the company, and the team for Inde had the same structure but with a different research assistant.

Empirical data were gathered through semi-structured interviews. The rationale for selecting potential respondents was to include informants from the various areas involved in the design process. In particular, designers were selected for interview based on their participation in different collections/projects most representing each company's diverse activities/areas. The joint research teams were vital to avoid the potential problem of interviewing only employees who were more aligned with the institution. In fact, the selection was implemented and facilitated by the joint research teams, that, thanks to their hybrid nature, allowed to prioritize the plurality of voices in selecting interviewees and, in turn, facilitate a polyphonic investigation. Data were collected from 21 interviewees from the product design and development unit at Soft Silk, and from 10 interviewees at Inde (see Table 1 for details).

An interview protocol was prepared for the semi-structured interviews, covering the interviewees' background and position in their company, questions on the meaning of creativity and collective creativity (sample questions: *What does creativity mean for you? What does collective creativity mean in your work context? Can you describe the lifecycle of the overall creative process?*), factors in gathering a creative team to support collective creativity (sample questions: *How did collective creativity*

TABLE 1 Key characteristics of respondents (role and number)

	Soft silk		Inde	
Role	**Role description**	**No.**	**Role description**	**No.**
Manager	CEO and other members of the management team (including the head of the design unit).	6	Head of the office and other members of the management team.	2
Product manager/ leader	The product manager is responsible for a specific collection and managing a small group of clients.	3	The project leader is a senior designer responsible for a specific project and managing a small group of clients.	2
Designer	The designer is responsible for product creation (design), usually working for a specific client over a given period; the atelier is the sub-unit that gathers the designers together, led by a senior designer.	6	The designer is responsible for the design, usually working for two or three specific clients over a given period.	6
Salesperson	The salesperson is responsible for a group of clients and gives strong support to the product managers in meeting clients, examining sales data and studying the markets.	2		
Expert	Specialist experts support product managers and designers in product design; they include brand managers, company archive managers, colour experts (who test colour changes in textile printing), Jacquard experts and printing experts/ technicians.	4		

come about? What are some of the key features/factors of collective creativity? What internal factors (relating to the team/collective creation and organization) seem to have influenced the process? What external factors (divisions/others in the company) seem to have influenced the process? What steps are you taking or do you think you need to take to enhance collective creativity?), and wrap-up questions. The protocol was refined and adjusted through feedback from the three practitioners from each company.

The participants were initially contacted by phone, and were then sent an email describing the research objectives and methodology. The interviews were conducted in person by a researcher and two research assistants (one for each case) in a dedicated meeting room at the company's premises. They lasted between 45 and 90 minutes, and were recorded and transcribed by the research assistant. To prepare for and contextualize the interviews, various data sources were consulted, including internal reports, presentations and strategy documents, marketing leaflets, and the websites of the companies and their clients.

Data analysis

An inductive, iterative analytical process aimed to identify elements illustrative of variables relating to supporting collective creativity. The process followed an iterative approach to coding (Saldaña, 2009), working through different phases until agreement was reached on categorizing and making sense of the findings.

In the first phase, all the transcriptions were read through several times separately by the researchers involved in the interviews. An initial group of transcripts was analysed and coded to identify key emerging views and issues on collective creativity. This was done separately at first, followed by joint discussions to agree on representative labels for the key themes identified. These were descriptive, adopting informants' own descriptions (Gioia & Chittipeddi, 1991). All other transcripts were then analysed in the same way. The independent coding became more consistent and the consensual coding faster.

The second phase moved to a more theoretical level. In line with Patton (1990) and Saldaña (2009), the themes were organized and grouped into initial categories, based on their similarities and differences. This involved repeated interactions between the researchers involved in the interviews, returning to the transcriptions when needed.

A further iterative analysis examined these findings, orienting toward factors relating to assembling creative groups and organizing collective creative work, and abstracting the categories into theoretical constructs that might identify and characterize the organizational variables for collective creativity. Tentative proposals for variables were repeatedly reviewed in meetings of the whole group of academics overseeing the wider collaborative research effort with the companies and, specifically, participating in the joint research team. Through this analytical process, five variables were identified: a structured process, work-related team diversity, boundary openness, adequate resources, and support by relevant technology.

This multi-stage process (Petriglieri & Obodaru, 2019) comprised both independent and collaborative analyses, strengthening the authenticity of the findings (Guba & Lincoln, 1994). On completion of the analysis, the findings were discussed with three practitioners from each company to verify key interpretations and conclusions.

FINDINGS

This section describes how collective creativity is understood, as exemplified in the interviewees' accounts, and then presents the five variables identified as supporting collective creativity.

Collective creativity perceived by creative teams

All respondents clearly identified the concept of collective creativity. For example, a designer recalled a specific experience during a project:

> I will always remember that night. The offices were deserted. Only my team was here. We worked together for two or three hours. There was a continuous exchange of concepts that jumped from one to another. Every idea generated was drawn on post-its and then put on a whiteboard. The result of this was a big group of post-its … At the end, no one could say "this one is an idea of mine," because the concepts were continuously generated, modified and adopted by all of us. It was almost a magic moment … Yes, it was a magic night (Designer A, Inde).

Emphasis on collaboration and the *collective* was evident, along with the idea that individual creativity is the initial source of collective creativity, with an intimate relationship between individual and collective creativity. Respondents suggested that individual creativity supports collective creativity, and vice versa: "The synergy between individual and team ideas is the basis of any exploration, which is necessary for creativity" (Designer A, Soft Silk). In addition to individual creativity's intrinsic value, the respondents considered it more important for collective creativity, using the metaphor of a Lego structure in which individual bricks interlock to create a (collective) structure.

If people work alone for too long, they may encounter "blocks" (mental rigidity) and thus need to share their work. Therefore, the respondents perceived spontaneous, informal relations to be important, underlining the value of communication: "We always communicate, share, transform and change ideas. We need to break down the walls" (Project leader A, Inde). They also suggested the importance of mutual trust and asking others for help: "Collective creativity comes from people: it requires mutual trust and a chemistry between people" (Designer B, Inde).

Thus, collective creativity was seen as a complex, dynamic combination of differing reactions and ideas to the same inputs and objectives. As a product manager said, collective creativity is about sharing reactions to an initial input:

> Collective creativity is about putting the beginning of a project in front of six different pairs of eyes … Collective creativity comes when I put images from the client on the table and all of us develop ideas in different ways and communicate our ideas (Product manager A, Soft Silk).

Many respondents, mainly designers, perceived collective creativity as a way to integrate individual passions, dreams and insights in order to create something novel with others. However, the need to manage collective creativity was also evident to most respondents with a leadership role: "'Collective' and'"creativity' stay together when they are managed correctly" (Project leader B, Inde).

Variables supporting collective creativity

This sub-section explains the five variables identified as relating to collective creativity: a structured process, work-related team diversity, boundary openness, adequate resources, and support of relevant technology.

A structured process

The processes in both companies followed a sequence of preparation, generation and verification/development, although, owing to the very different timescales of the two industries, the first stage tended to be a brainstorming process at Soft Silk and a research process at Inde. Interestingly, setting up the team, defining a tentative timeline and planning the process were common features.

At Soft Silk, the process followed a quite consistent flow, and the respondents were able to identify some key phases. A product manager and a salesperson usually arranged a first meeting with the client to receive the initial brief and other inputs for the project. Both usually attended the meeting to gain a more precise idea of the client's needs and desires. Extensive research was carried out in advance to understand the client's history and evolution, enabling suggestions of initial insights during this meeting, after which the product manager, in collaboration with the head of the atelier, determined the composition of a new team of designers and experts. The team met for a first brainstorming session while inputs from the client were still "fresh." After the product manager had related what had been gathered from the client, the designers usually started to discuss and express their ideas for development: "Each proposal or idea triggers 'something' in somebody else's mind – for example, an awesomeness from a collection a long time ago" (Designer B, Soft Silk). This phase was perceived to be complex and emblematic, but nonetheless important:

> Interpretation of these inputs is very loose because the brief, or the initial idea, consists only of a series of images that the team has to interpret into a mood, a style, an emotion that the future design choice should comprise (Designer C, Soft Silk).

At this stage, collective creativity helped in understanding and even anticipating clients' needs. The respondents also suggested that better initial definition of clients' needs reinforced collective creativity during subsequent phases: "The scarce and sometimes misleading information that [the client] gives needs to be translated into understandable specific goals for developing our collective creativity further" (Designer B, Soft Silk). In these kinds of meetings, everyone had opportunities to contribute. The product manager then established the process for developing the collection, setting tentative deadlines and assigning roles, workloads and priorities. The product managers believed this organization to be important to support collective creativity:

> It's important to have clear roles and this supports our creativity … Otherwise, the risk is of invading the role of the others too much, so the group would begin to work less well together and collective creativity would be reduced (Product manager B, Soft Silk).

> Collective creativity is a matter of organizing: creating a project, a team, a process (Product manager C, Soft Silk).

Other actors agreed that this tentative plan seemed to support the development of collective creativity:

> It's important for our team creativity to have someone who defines the timeline and manages the process (Designer A, Soft Silk).

> Collective creativity is like a magma in which the group leader must provide direction and have a full understanding of the people and the process (Expert A, Soft Silk).

The second key phase included developing some design drafts, usually within three or four days, after which the team met to cluster the various designs. Everybody shared opinions, and this triggered a further chain of reactions, building on each other's contributions: "A necessary condition for collective creativity is having creative individuals sharing common collective ideas and goals" (Product manager C, Soft Silk).

In the third phase, the designers altered their work according to the outcomes of the meeting, while specific experts, together with the product manager, devised proposals on the various fabric textures to be used (rather than asking which the client preferred, to reduce the risk of receiving costly or infeasible requests). By the end of this phase, the group had met several more times to coordinate final adjustments prior to a further meeting with the client. The designs were colored and printed on paper to create visual impact. At the same time, pieces of cloth were prepared to provide tactile samples of the final product. The product manager, sometimes with a designer, met with the client and determined revisions. The final alterations were developed through a similar process: "Throughout the process, all the group's members meet often, almost daily, in order to review progress and adjust the aim of the project" (Designer D, Soft Silk).

At the end of this phase, a prototype was developed. In parallel, the color experts developed variants based on the client's suggested color palette, and if possible these were sent to the client together with the prototype. After another three or four days, on average, the client made the final choices, usually selecting around four to six designs from about 50 created by the team. In summary, collective creativity seemed to be stimulated by the different phases of the process and their organization.

Similarly, at Inde, the organization of the process seemed to be important for collective creativity:

> "Collective creativity relates to a continuous process that cannot be fully routinized and yet needs to be managed and outlined" (Designer C, Inde).

Each project usually followed a sequence of three phases: research, envision and deploy. The projects lasted for about a year on average, but ranged from three months to two years. In the first phase (research), the project leader met the client to establish the collaboration by defining guiding principles and tentative timelines. A team of designers was then created, and after a few team meetings, in-depth research began. The research aimed to gather knowledge of end-users' potential views, using methods ranging from survey to ethnographic inquiry. For example, in a project to design a new chair, the research began with a field study: participants gave their spontaneous reactions during "sit-and-work" sessions on different chairs, and their initial and final levels of perceived comfort were recorded. The results of this research steered the team toward specific designs and stylistic approaches and were the inputs for collective creativity: "The results from the research help us to develop a clear definition of the problem and the relevant needs. This is an important input for developing our creativity" (Designer A, Inde).

The second phase (envision), relating to generating ideas, involved team meetings, informal meetings and brainstorming sessions, along with the creation and analysis of prototypes, particularly in the case of product design. This phase appeared to be very important for the development of collective creativity:

> What the client really asks for very often doesn't correspond with the initial brief we have received … As a group, we fill this gap by developing our creativity thanks to this "protected" phase of the process (Designer D, Inde).

Ideas were then selected, and a limited set of alternatives defined.

During the third phase (deploy), the ideas were presented to the client at several meetings involving the project leader and a few, or occasionally all, members of the team. This phase finalized the design collaboratively. These meetings were sometimes quite complex, because some clients were not used to "collaborative meetings" involving idea sharing, so a few loops through envision and deploy might be necessary. At this point, the design was usually broken down into sub-parts assigned to specific members or sub-groups of the team. Again, having clear roles seemed to be important for the team: "When we know each other's roles, we create better" (Designer E, Inde).

The last part of the deploy phase determined the final details and specifics of the design. Collective creativity seemed to be supported by a process of creating final solutions that might change or improve the client's initial idea, or offer "something different." Collective creativity was clearly perceived in all phases of the project: "Collective creativity is about building, contributing, producing, generating, creating, finalizing, and interpreting" (Project leader B, Inde).

Work-related team diversity

Team diversity was perceived by the respondents in different ways. At Soft Silk, respondents believed that having a (limited) variety of styles based on team members'

previous job-related experience impacted on collective creativity. As one team member suggested:

> "The hand of the designer can be more or less compatible with the client … So the team should include different styles, but under the umbrella of this compatibility" (Salesperson A, Soft Silk).

In practice, previous experiences with a specific client (or a stylistic cluster) were important in determining the team composition, in order to better define and refine the goals of the team's creative effort. This was expressed by one designer as a very important element: "It's hard to describe the sensibility that is developed over the years with the client. For example, I can feel in advance that there will be something wrong or not in a proposal, even before receiving feedback from the client" (Designer C, Soft Silk). Overall, at Soft Silk, moderate stylistic variety supported collective creativity.

In contrast, at Inde, the teams were usually composed of people with differing backgrounds, experiences and cultures, and from different countries (e.g., Italy, the United Kingdom, Sweden and Turkey). They had backgrounds in architecture, and industrial, product and graphic design. This diversity of backgrounds and roles seemed to create a climate open to different points of view, supporting collective creativity:

> The diversity of backgrounds and roles makes it possible for the group to analyze problems considering a broader set of perspectives and then choose a great solution from a wider set of alternatives (Designer D, Inde).

Pursuing this idea, a manager confirmed:

> The goal for the future is to develop a creative group of multidisciplinary internal resources that includes not only different kinds of designers and architects, but also ethnographers, sociologists, engineers, technicians, computer scientists, and also people with more analytical and managerial skills (Manager A, Inde).

Thus, at Inde, work-related team diversity supported collective creativity.

Boundary openness

Boundary openness was viewed slightly differently by respondents in the two case studies. At Soft Silk, it was perceived as enabling collective creativity only in terms of the client's direct (but not excessive) involvement with the team. One designer suggested:

> Having the client with the team for a week was important. This presence is definitely a stress factor, because it affects team timelines and methods. It's very hard to work with such a pressure, but it has been positive for our creativity (Designer E, Soft Silk).

This positive effect related to transforming pressure from the client into a trigger for collective creativity, although designers and managers agreed that including the client in the team was also potentially problematic. For example, a manager underlined:

> When we had the client here, a designer told me: "I'm not going back on this drawing again." Repeatedly working and reworking on something is exhausting and probably ineffective … This didn't help team creativity (Manager A, Soft Silk).

A suggested compromise was to have frequent contact between team members and client, rather than the client's direct and constant presence, except for quick responses in emergencies. One respondent recalled: "Finding a good way to communicate frequently with the client was helpful in getting team results; I mean understanding how to use their input for developing creative ideas" (Product manager A, Soft Silk).

At Inde, involving all stakeholders (not only the client) was seen as a key factor for collective creativity. The client's involvement, particularly during the deploy phase, was naturally considered important. One designer said: "As a team, we work with the client because we think that their active presence is important" (Designer B, Inde). The team often invited the client to joint meetings and discussions:

> We propose about eight solutions to the client and we examine the solutions together. Sometimes none of them is OK, but if at least one aspect is appreciated, we will focus our creativity around that element (Designer F, Inde).

Other stakeholders were also involved during the initial research phase. A designer explained:

> For example, if we are developing a project in healthcare, we try to involve, maybe through interviews, a nurse, a patient, a technician, a doctor … Understanding how each stakeholder will react, and understanding their expectations, is very stimulating for team creativity (Designer A, Inde).

Integrating inputs from different stakeholders seemed to support collective creativity.

Adequate resources

Availability of team resources was also perceived slightly differently by respondents from the two companies. At Soft Silk, the crucial team resource identified was time. Development of a collection was very often paced by the client's needs, leaving little room for the team to take more time if needed. Although both designers and managers claimed that in theory they would like more time to support creativity, in practice they were also used to being creative within relatively limited timeframes. Paradoxically, this pressure sometimes drove accelerated, but effective, creativity:

> On that occasion, clothes were printed and delivered the night before the client's show, so they were literally just cut and stapled together directly onto the models … At the end, though, it was a huge success (Product manager B, Soft Silk).

At Inde, the respondents identified not only time, but also the physical work environment. Some, mainly managers, suggested that these resources were important and should be available, but only to a sufficient level, beyond which they were unlikely to impact on collective creativity. Other team members, especially the designers, emphasized the importance of team resources much more strongly, and particularly in terms of physical environment and spaces, in supporting collective creativity. From this perspective, the physical spaces should be extremely flexible and comfortable. A designer said: "I want to be able to move easily from space to space and always find a comfortable space in which I can stay with my team to work even for two entire days" (Designer E, Inde).

The variety of spaces available (meeting rooms, project rooms and various common spaces) seemed to encourage this flexibility. Their layout also enabled intense communication and, ultimately, collective creativity. For example, a designer recalled a specific episode: "A small table was fundamental. We were physically close. And we were physically concentrated … It was very energetic" (Designer C, Inde). Overall, the physical work environment seemed to support collective creativity, particularly for the designers:

> "Creating a collective space – a physical space and thus a cognitive space – is critical for collective creativity" (Designer F, Inde).

Support of relevant technology

In each case, different elements relating to technology were perceived as crucial supports for collective creativity. At Soft Silk, an emerging element was the availability of adequate technology, including specific software (e.g., Adobe Illustrator and computer-aided design software), computers and tablets for drawing, and equipment for printing the drawings onto fabrics. A designer suggested:

> "Technology is an important enabler for our creativity; the touch, the smell of the product, and the morphological structure make a big difference" (Designer D, Soft Silk).

For example, on one project, the team's creative contribution related specifically to the introduction of a lighter, 22-ounce silk, thanks to a newly available technology. This idea emerged at a team meeting, where the group's challenge was to give a traditional collection a younger and more extrovert identity: "It was the perfect way to rejuvenate the brand" (Product manager A, Soft Silk). Of course, in order to take advantage of technology for collective creativity, teams required appropriate technical know-how, and thus always included a technician. A designer underlined: "The technician we have in the team is the one who translates the drawings into textures … This synergy is great for our collective creativity" (Designer C, Soft Silk).

Similarly at Inde, technology referred mainly to the creation of 2D and 3D technical drawings and prototypes. When possible, new technology such as 3D printing was embraced. All respondents considered technology to be important for collective creativity because it allowed the creations to be "touched" and then refined, and/or more ideas created. For example, a project leader stated:

> "Technology is an important enabling factor for collective creativity" (Project leader A, Inde).

At Inde, groupware technology also seemed to support collective creativity. Intense interactions between team members, clients and other stakeholders, particularly on projects involving people from different countries, were enhanced by video-conferencing tools and social media platforms.

Table 2 presents a partial synopsis of the findings.

DISCUSSION

This study investigated collective creativity and the role of different organizational variables in supporting collective creativity in the context of creative settings. The results suggest five variables that are important in supporting collective creativity from a managerial perspective.

With regard to the meaning of collective creativity itself, the respondents confirmed the importance of

TABLE 2 Findings from the two case studies: A partial comparison

		Key elements	
		Soft silk	**Inde**
Meaning of collective creativity		Integration of ideas and reactions Synergies between individual and collective ideas	Emphasis on collaboration and mutual trust Individual creativities toward collective creativity
Variables	A structured process	Project view with specific phases Challenging objectives Clear roles throughout the project	Project view with specific phases Evolving objectives Specific roles at the final stage
	Work-related team diversity	Limited diversity of styles	Diversity of roles and backgrounds
	Boundary openness	Inclusion of clients	Inclusion of various stakeholders
	Adequate resources	Time	Physical work environment
	Support of relevant technology	Software Hardware, including printers	Hardware Software Groupware

collective creativity at work. They identified its key characteristics, emphasizing the importance of collaborative relationships and interactions, and the intimate *interconnection* between individual "creativities" and the resulting collective creativity. In other words, they underlined that ideas always emanate from individuals, but the actual source is very often interactions between people (Nijstad & Paulus, 2003). In fact, these interactions trigger "eureka moments" of individual creativity which, through additional interactions, trigger further moments of individual creativity. In line with the literature (e.g., Hargadon & Bechky, 2006), the results of both case studies suggest an emphasis on collaborating, combining inputs and ideas, and mutual trust. In particular, communication and mutual trust are key to sharing ideas collaboratively (Barczak *et al*., 2010; Boies *et al*., 2015). In this study, trust was commonly considered to be an essential element embedded in the collective and collaborative dynamics of creativity (Bidault & Castello, 2009). Actually, trust enables interactions between help-seeking and help-giving, which characterize collective creativity (Hargadon & Bechky, 2006). In turn, the embodied interactions within and across teams (for example, regular face-to-face meetings) may further support the incremental development of mutual trust (see Whitener *et al*., 1998). In both cases, respondents showed an overall alignment on views and efforts around collective creativity, probably because these creative settings, similarly to the majority of creative industries, comprise a strong focus on creative ideas, with intrinsic motivation for creativity at the very center of workers' engagement (e.g., Eikhof & Haunschild, 2006; Hargadon & Bechky, 2006).

The results suggest the importance of appropriately designed *micro social systems* (groups, teams, collective entities) within the organization (e.g., Cirella & Shani, 2012; Hirst *et al*., 2009). Of the five variables identified as supporting collective creativity in creative teams within organizations (a structured process, work-related team diversity, boundary openness, adequate resources and support of relevant technology), all respondents attached considerable importance to a structured process and the support of relevant technology.

Detailed organization of the process must be managed carefully to support collective creativity. The literature on collective creativity illustrates the relevance of process design to enhancing collaborative dynamics (e.g., King & Anderson, 1990). Furthermore, both case studies underline the importance of design elements: the more the objectives are challenging and evolving yet defined, the phases clear and the roles outlined, the more collective creativity will be supported (e.g., Elsbach & Hargadon, 2006). The results confirm that interpreting collective creativity as a de-structured and boundary-less process is ineffective, and that appropriate design of the process is required. Leaders aiming to enhance collective creativity should carefully plan phases and deadlines, include routine and non-routine activities, support formal and informal communications, and assign specific roles within the team.

In the two case studies, respondents' perceptions of the meanings and importance of work-related team diversity, boundary openness and availability of adequate resources seemed to vary. The first two variables relate to defining the individuals and stakeholders assigned to or connected with the team. Despite extensive debate on the role of diversity in developing collective creativity (e.g., King & Anderson, 1990; Milliken & Martins, 1996; Shin *et al*., 2012), respondents from Soft Silk did not emphasize this aspect. Respondents from Inde underlined the importance of diversity in roles and backgrounds (see Hewing, 2013), and the inclusion of various external stakeholders, but did not mention other dimensions of team diversity. The difference between the two case studies may relate to the companies' differing profiles. Soft Silk employees are slightly older and more mature, so although role diversity is important for creative teams, balanced with the centrality of clients, it may appear

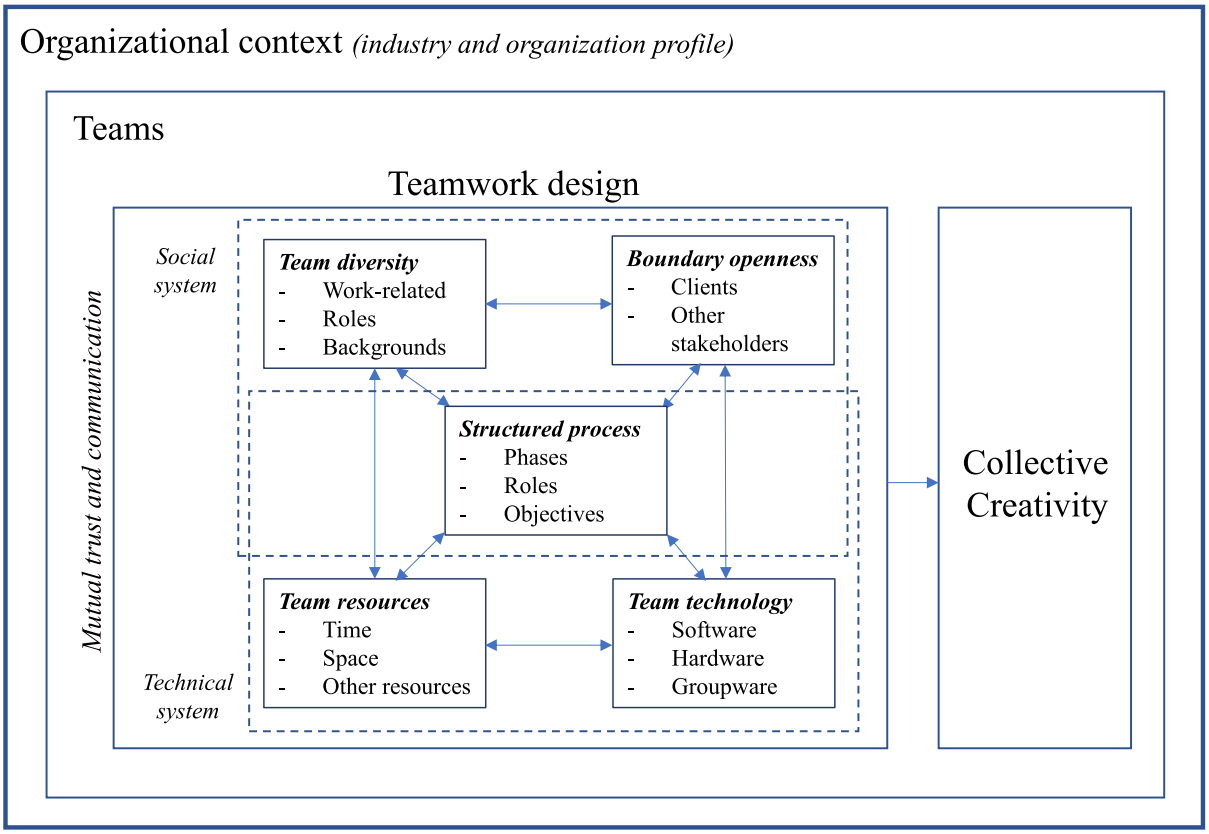

FIGURE 1 Organizational variables supporting collective creativity

obvious and be taken for granted, particularly by respondents with more seniority. At Inde, where several design disciplines often intersect in consulting projects, including various (internal and external) design specialists in different combinations for each new project is perceived as key. This perspective, along with the company's younger and more dynamic profile, may explaat Inde respondents' emphasis on diversity and boundary openness supporting collective creativity.

Similarly, the respondents expressed various views on team resources relevant to supporting collective creativity. Respondents from Soft Silk discussed the controversial issue of available time or time pressure, which is a challenge in fashion-related industries, particularly in dealing with the hectic deadlines of fashion shows and seasonal launches. Although the literature focuses mainly on the *problems* associated with time pressure and creativity (e.g., Chirumbolo *et al.*, 2004), time pressure in this context seems to be a double-edged sword, with opposing effects on creativity. In fact, the findings suggest that time pressure may inhibit creativity, yet may also challenge the team and push it towards new solutions (see, e.g., Unsworth, 2001). At Inde, respondents underlined the importance of the physical work environment, suggesting that appropriate and varied team spaces (coherent with the company's dynamic profile) may provide important support for collective creativity (Moultrie *et al.*, 2007). Their views confirm recent literature on the physical environment's functional, psychosocial and inspirational support for creativity, especially in creative industries (for the digital art sector, see Hoff & Öberg, 2015). Overall, the results of this study are consistent with the view that awareness of available and unavailable resources helps a team to give tangible form to its creative ideas (e.g., Bissola & Imperatori, 2011). Rather than providing a vague abundance of resources, adequate resources must be clearly designed and defined.

The last variable is technological support. The respondents clearly described the importance of both specific technological resources (hardware, software and groupware) and technical competences within the team. This suggests that designing social and technical systems conjointly may support collective creativity (Mannucci, 2017; Shani *et al.*, 2000). Figure 1 illustrates the results relating to collective creativity and its variables.

IMPLICATIONS AND CONCLUSIONS

The proposition of this paper is that collective creativity is vital in creative settings, relating to interactions, communication and mutual trust between members of groups

and teams which can be managerially supported. Five variables that support collective creativity have been identified and discussed: a structured process, work-related team diversity, boundary openness, adequate resources, and the support of relevant technology. These seem to play an important role in supporting teams' collective creativity in creative settings and, therefore, offer specific guidance on collective creativity by design, contributing to the theoretical and practical challenges of managing creativity in creative settings/industries in a way that combines the ethos of the creative effort with achieving performance and outcomes.

In terms of managerial implications, the variables discussed in this study may be used as guidelines on supporting collective creativity. For example, clarity about the work process, including definitions of phases and roles, enhances collective creativity by helping complex teams to focus on key facts and issues. Relevant technology may also nurture collective creativity, through individual team members' technological competencies and use of technology to support the development of creative ideas. These variables might, for instance, be transformed into elements to develop gamification for collective creativity (e.g., Parjanen & Hyypiä, 2019 on low-tech board games).

In terms of boundary conditions, both organizations can be considered "egalitarian professional organizations" (Hargadon & Bechky, 2006, p. 497) and characterized by a close focus on creative ideas. These features seem to represent the conditions under which the proposed theoretical model is generalizable to other creative settings/industries, and potentially to other contexts. Thus, the study offers insights relevant to most creative industries, and particularly to the managerial challenge of supporting collective creativity by design.

Nevertheless, further systematic investigations might focus on different industries (Peltoniemi, 2015) to explore industry-related characteristics that impact on the identified organizational variables. As the list of variables emerging from this study might not be exhaustive, future research on collective creativity might also explore additional variables and creative processes. Further development of measures of collective creativity is another important area for future research. A natural extension of this study would be to transform the five identified variables into a questionnaire or scale.

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