

Organizational Variables for Developing Collective Creativity in Business: A Case from an Italian Fashion Design Company

Abstract

The goal of this article is to propose a theoretical framework of collective creativity within an organizational design perspective and contribute to clarify this concept and how collective creativity can be purposefully managed. In particular, this study identifies relevant organizational variables for enhancing collective creativity and examines the relationship between collective creativity and organizational performance. The research draws upon a survey developed in the context of an in-depth collaborative research study with an Italian fashion design company. Since the theory on collective creativity is quite dispersed, the first part of the article attempts to define collective creativity and integrate different theoretical perspectives. Then, method and empirical findings are described. In the last part, the discussion illustrates why it is important for researchers and practitioners to be aware of the concept of collective creativity and the purposeful management of it.

Keywords

Creativity, Collective Creativity, Creative Processes, Team Creativity, Organizational Variables, Organization Design, Collaborative Research, Fashion Design

Introduction

Organizations cannot survive, generate innovation, sustain their market positions or increase their market share without creativity; most companies depend on developments driven by ideas about organizational solutions, products and services that are novel and useful (Amabile and Khaire, 2008; Kylén and Shani, 2002). Most creative ideas are the outcomes of exchanges in a collective space, when interactions trigger ideas through dialogue, debate and conflict (Chen, 2006). Creativity in business seems to be the result of collaboration, interactions and exchanges of ideas between individuals who work together (i.e., Amabile and Khaire, 2008). Thus, organizations are increasingly relying on group-based structures to trigger creativity (Baer, 2010) because they seriously consider the complex nature of many efforts of development, as well as the need to deploy a variety of resources to solve significant problems. Catmull's study of the filmmaking industry argues that 'creativity involves a large number of people from different disciplines working effectively together to solve a great many problems' (Catmull, 2008, p.66).

Organizational scholars argue that the psychology discipline, remaining mostly at the individual level of creativity, is not really addressing the nature and complexity of the phenomenon (Amabile, 1983). Kurtzberg and Amabile (2001) claim that relatively little attention has been paid to creativity that is occurring at the collective level in the context of small groups of individuals and/or teams such as project teams or cross-functional teams. The literature has a general lack of comprehensive models of collective creativity (Bissola and Imperatori, 2011). As such, different types of organizational variables need to be tested in order to investigate their potential impact on collective creativity. Such new insights could also guide

managerial actions around the design of organizational systems that fosters collective creativity and, in turn, organizational performance (Cirella et al., 2014).

The goal of this article is to propose a theoretical framework of collective creativity, exploring how collective creativity can be fostered by an appropriate organizational design, as well as how it can affect organizational performance. In particular, this article contributes to clarify the concept of collective creativity and illustrate how collective creativity can be intentionally managed in a purposeful and systematic way. This effort is in line with recent research on the development of group/team/collective creativity in which creativity of individuals and groups is viewed in relation with the organizational system (Le Masson et al., 2011; Cirella and Shani, 2012; Somech and Drach-Zahavy, 2013). Despite the increased attention devoted to this field of study (e.g. Jiang and Zhang, 2014), scientific literature has yet to demonstrate the empirical links between a comprehensive set of organizational variables, collective creativity, and organizational performance. Building on literature related to group and team creativity, this study examines the effect of organizational variables on collective creativity, the effect of collective creativity on organizational performance, and generates new scientific insights. This study relies on the findings from a collaborative research project developed with an Italian fashion design company. Following a qualitative study about creativity, data were collected by means of a survey along with an in-depth collaborative work of preparation and interpretation. Developing intervention research via a process of collaborative/action research seems consistent with recent methodological recommendations (e.g. Börjesson and Elmquist, 2011; Cirella et al., 2012; Shani et al., 2012, Radaelli et al., 2014; Elerud-Tryde and Hooge, 2014).

Theoretical Background and Hypotheses

If creativity can be viewed as the ability to bring something new into existence, then it follows that many people ‘still view creativity as purely a product of individual talents and traits’ (Amabile and Pillemer, 2012, p. 3). Actually, in the 1960s and early 1970s, the view that creativity depends solely on qualities of unusual persons was the most prevalent in scientific literature (e.g. Guilford, 1963; Torrance, 1966). In contrast, the seminal work of Simonton (1975) and Amabile (1979) developed a social-physiological perspective of creativity. Then, Woodman et al. (1993) offered a crucial contribution that widened our understanding, proposing an organizational view of creativity. Organizational creativity is viewed as ‘the creation of a valuable, useful, new product, service, idea, procedure, or process by individuals working together in a complex social system’ (Woodman et al., 1993, p. 293). Based on this background, organizational scholars suggest that the need for consistent and holistic models of action able to help practitioners tackle organizational dynamism (e.g. Bissola and Imperatori, 2011) is a major gap in the current literature. The organizational literature on collective creativity is limited and dispersed between different terms (e.g. team creativity and group creativity) and perspectives (Cirella et al., 2014). When considering these different perspectives together, the resulting view is consistent with the complex nature of organizations as social systems (Jiang and Zhang, 2014). Thus, collective creativity can be referred to as *micro social systems* that are nested within organizations and composed of individual members, or lower-level micro social systems (Quinn, 1992; Morgeson and Hofman, 1999). A micro social system represents a limited amount of people (small groups or teams) that are part of a social network and are motivated to cooperate to reach a common final goal (Quinn, 1992). Four corollaries can be underlined.

(1) Micro social systems refer to a group of a limited number of people who collaborate between themselves. The concept of a collective is used to describe groups of small size that operate within an organizational context, for example a small team. These individuals work

together at various levels of reciprocal dependence with engagement in a specific interest (Quinn, 1992). The interactions among individuals are driven by intrinsic motivation, such as engagement in a problem or sharing a common interest.

(2) *Micro social systems aim to accomplish a common goal.* Individuals work together in a context that fosters an on-going exchange of ideas and insights (Hargadon and Bechly, 2006) with the final objective of achieving a common goal.

(3) *Micro social systems include the individual dimension.* The collective approach includes and brings out competencies and contributions of persons in the group. This generally includes different roles, experiences, and backgrounds. Taking advantage of different experiences and backgrounds is seen as a way to enhance a collaborative flow of ideas, rather than destabilize the group (Barczak et al., 2010; Jiang and Zhang, 2014).

(4) *Micro social systems include the organizational dimension.* The common ‘tools’ that the individuals can use are organizational mechanisms and practices derived from the organization design (Le Masson et al., 2011). A collective perspective explicitly emphasizes the interdependence of all human beings in every kind of social entity. In fact, this is related to the view that the whole is greater than the sum of its parts.

Introducing the Concept of Collective Creativity

Since the theory on collective creativity is quite dispersed, introducing a definition of collective creativity is definitively important. If collective creativity occurs at a *micro social system* composed of individuals working together within an organization, this concept can be defined as a purposeful *set of processes*, activities and mechanisms established by that *system*, through which a novel idea, product, service or procedure are generated (Cirella and Shani, 2012). Thus, collective creativity can be viewed as a *process* driven by the desire for a deeper level of understanding (inquiry) and action. It is the outcome of a synergistic

integration that utilizes some forms of learning mechanisms (Catmull, 2008; Hirst et al., 2009). Collective creativity relies on the development of knowledge and understanding that occurs in the context of a micro social system that addresses a challenge of common concern (Chaharbaghi and Cripps, 2007). In the context of this process, some kinds of interactions between people in the micro social system are particularly important. For example, Hargadon and Bechly (2006) identify three specific 'interaction precipitating moments', namely help seeking, help giving, and reflective reframing. Help seeking and giving create opportunities for social interactions that connect people. The desire to provide useful insights to others is of major importance because collective creativity is related to social interactions led by common interests. Reflective reframing happens when each individual respectfully attends to and builds upon the comments and actions of others (Hargadon and Bechly, 2006). Of course, these behaviours can occur within the micro social system and between different micro social systems providing connections between different discourses and even organizational structures and functions. The organizational design choice can widely influence the development of suitable systems that enhance collaboration and, in the last instance, collective creativity (Chaharbaghi and Cripps, 2007). An integration of the current literature allows us to identify different organizational variables influencing collective creativity.

Organizational Variables Influencing Collective Creativity

The perspective explored in this article is about the attempt of an intentional management of collective creativity. In particular, some organizational variables can be related to how the process of collective creativity can be managed in a purposeful and systematic way. Of course, management cannot force collaboration but can explore organizational design choices aimed at increasing the flow of ideas and knowledge within and between teams, fostering the process of collective creativity. The pattern of organizational variables that aims to reinforce

collective creativity adopts the results of a comprehensive review of the existing literature (Cirella et al., 2014). In particular, five organizational variables are in line with the perspective of this study. They are: (i) structured processes with specific tasks, activities and roles for the members (e.g. Hargadon and Bechky, 2006; Ohly and Fritz, 2010); (ii) diversity and combination of individuals with different work-related characteristics (e.g. Perretti and Negro, 2007; Bell et al., 2011); (iii) boundary openness in terms of interactions between team and non-team members (e.g. Shalley and Perry-Smith, 2008); (iv) resources available to the team, e.g. spaces and time (e.g. Sung and Choi, 2012); (v) technological support, including technical competencies, groupware and specific hardware/software (e.g. Elerud-Tryde and Hooge, 2014).

In particular, the variable of structured processes includes the definition of the task, related phases/activities of the work process, and related roles for the members (Mumford, 2000). The problem identification, and thus the task and related activities, play a crucial role in enhancing creativity (Mumford et al., 2002) as it helps the people focus on the key, relevant facts and issues. This does not mean creating rigid and formal structures, as this would constrain creativity (e.g. Amabile et al., 1996; Rosso, 2014), but designing a consistent idea of the overall process and broad core duties (e.g. Mumford, 2000; Cirella and Shani, 2012). Then, team diversity in terms of the functional diversity of roles, competencies, experiences (Mannix and Neale, 2005), as well as the involvement of external points of view and expertise (Shalley and Perry-Smith, 2008), can nurture collective creativity thanks to the variety of knowledge, culture, and experiences. (Bell et al., 2011; Gassmann, 2001). At a different level, previous literature also suggests that resource allocation such as physical spaces, budget, and time, is positively related to collective creativity (Amabile et al., 1996; Miron et al., 2004; Moultrie et al., 2007). Finally, the support provided by relevant

technology can enhance creativity (Shani et al., 2000; Elerud-Tryde and Hooge, 2014) via the technological competencies of the individuals along with the actual use of this technology.

Hypothesis Development

This section illustrates the hypothesis development on how collective creativity can be fostered by a pattern of organizational variables as well as its effect on organizational performance.

(1) Organizational variables can reinforce collective creativity. Organizational design choice made by managers can widely influence collective creativity. Collective creativity occurs at a micro social system that provides connections between different discourses and points of view and management can intentionally promote a collective and creative process adopting specific organizational choices. A pattern of organizational variables that aims to reinforce collective creativity could potentially represent a construct related to an organizational facilitation of the process of collective creativity (Kylén and Shani, 2002). In this study, the emerging pattern refers to the five organizational variables discussed above, namely: (i) structured processes with specific tasks, activities and roles; (ii) diversity and combination of individuals with different work-related characteristics; (iii) boundary openness in terms of interactions between team and non-team members; (iv) resources available to the team, e.g. spaces and time; (v) technological support, including technical competencies, groupware and specific hardware/software. Thus, in line with the potential effort of pursuing a comprehensive perspective (e.g. Cirella et al., 2014), an integrative hypothesis has been initially developed:

Hypothesis 1: Organizational variables for supporting creativity, namely structured processes, diversity, boundary openness, level of resources, and technological support, will be positively related to collective creativity.

(2) *Collective creativity coexists with individual creativity.* In the existing literature on creativity, there has been little attention given to the relationship between collective and individual contributions of members (Pirola-Merlo and Mann, 2004) because, for many years, collective creativity and individual creativity appeared in opposition (e.g. Steinbeck, 1952, and Florida, 2002). On the contrary, recent literature suggests that each of the two concepts seems to make the other meaningful (Chaharbaghi & Cripps, 2007; Watson, 2007). Thus, in a holistic view of collective creativity, individual creativity needs to be included and, in particular, collective creativity and individual creativity seem to exist in an ‘and/both’ rather than in an ‘either/or’ relationship (Chaharbaghi & Cripps, 2007). Taggar (2002) and Pirola-Merlo and Mann (2004) suggest a positive correlation between individual and collective creativity. Because collective creativity takes advantage of the collaboration between different individuals who integrate their pieces of knowledge referred to a common concern or interest (Hargadon and Bechky, 2006), this concept does not reduce, but underlines, the relevance of individual creativity. The intrinsic relationship between collective and individual creativity seems to be related to a ‘creative synthesis’ (Harvey, 2014) occurring along a complex social process (Watson, 2007). In conclusion, in line with the view of a mutual relationship between collective and individual creativity (Chaharbaghi & Cripps, 2007; Watson, 2007), the following hypothesis has been developed:

Hypothesis 2: Collective creativity and individual creativity will be positively correlated.

(3) *Collective creativity aims to achieve positive organizational performance.* Collective creativity means that individuals share their competencies and experiences in order to solve a multi-faceted task or problem, which cannot be solved individually. The on-going dialogue

and exchange of ideas and experiences enable to trigger new interpretations of data and facts, along with new discoveries of distant analogies that could not have been achieved individually (Hargadon and Bechly, 2006). In the organizational context, individual and collective creativity together can support the development of ideas, solutions, services or products that can satisfy customers and therefore achieve positive economic results (e.g. Rowatt et al., 1997; Jiang and Zhang, 2014). Thus, the following two hypotheses have been developed:

Hypothesis 3a: Collective creativity and individual creativity will be positively related to client satisfaction.

Hypothesis 3b: Collective creativity and individual creativity, with customer satisfaction, will be positively related to economic results.

Methodology

Context of the Research

Data were collected in the context of a collaborative management research process, developed following an Intervention Research approach (Hatchuel and David, 2008), in order to achieve both rigorous and relevant results. The nature and ongoing challenges of creativity in the fashion and design industry made the choice of industry simple. As such, the excitement of the first CEO that was approached about the possible collaboration, out of a few possible alternatives, led to the early conclusion that the collaborative inquiry process was likely to result in a new model of creativity that could trigger a potential breakthrough for the company. The company, with over 100 years of history, is one of the top five firms that design and produce silk for prestigious fashion labels. Initial meetings with the CEO and

top management indicated that understanding, enhancing, and facilitating creativity within the organization would address a major area of ongoing challenge and concern. The company targets the premium silk market segment – a niche in which creativity is the key (the company’s clients include some of the biggest and well-known players in the fashion industry). The CEO gave his full commitment to a pioneering research project to capture the meaning of creativity and explore alternative ways to design and enhance the creative process. A first study identified insights about the meaning of creativity at the organization along with an understanding of the context in which individuals could synergistically develop their creativity for each specific product cluster (collective creativity). Since the meaning of collective creativity and its particular connotations within the company had already been determined, the purpose of the second study included the identification of key organizational variables that affect collective creativity. A joint research team, consisting of three individuals from the company and three from academia, led the study. The joint research team explored different methodological alternatives for achieving the objective of the research and decided to develop and administer a survey – in order to gain insights and collect evidence on the links between concepts (Forza, 2002).

Procedure and Sample

Data were collected using a survey distributed to all the personnel of the ‘Product Design and Development’ unit. The unit includes four different clusters of roles: product managers, designers, experts, and salespeople. Table 1 outlines the profile of the roles.

Insert Table 1 about here

In the design unit, people are assigned to a specific client for a specific collection. This group of individuals is composed of a product manager, a salesperson, and between three and five designers from the company *atelier* – the subunit that gathers all the designers. Other individuals may be involved on an as-needed basis, for example, specific colour experts or technicians. Thus, each group is typically composed of 5-8 individuals. These groups are not viewed as rigid fixed teams (they may change with any new collection) but are dynamic, flexible, and inserted within internal (other groups, other units) and external networks (clients, suppliers). The lifetime of a specific group is typically the period of a collection development.

The questionnaire was sent by email with a covering note from the CEO to all the personnel of the design unit. The recipients were asked to print the questionnaire and complete it. Two academic members of the joint research team were available at the company to answer any questions, clarify any doubts, and physically collect the hard-copy documents. After an email reminder, a response rate of 80.81% (made possible by the collaborative approach) was achieved – meaning 80 respondents out of 99 individuals of the unit. The high response rate guarantees numerous responses within roles, allowing the generalization to the design unit level. The response rate also indicates the high level of participation of the organization and the perceived relevance of the study. Each respondent was asked to focus on a specific collection she/he recently participated in, from beginning to end. When the respondent was recently and thoroughly involved in two collections, as it appeared quite frequent, the respondent was asked to separately answer for both. After the later exclusion of a few anomalous cases (for missing values), the actual sample for the analysis was composed of 113 projects/collections.

Measures

The items were measured on a 6-point Likert scale. The survey questionnaire was reviewed during a number of successive research team meetings; the lexicon was refined and adapted to the specific context, and the items better defined so they could be more easily understood and interpreted by respondents. The joint nature of the research team guaranteed both the scientific rigor, relevance, and comprehensibility of the research instrument (Bartunek, 2008). Then, the survey questionnaire was pilot-tested on three organizational members in order to verify the adequacy of the instrument. The fact that this survey questionnaire, based on the results of the first qualitative case study, was embedded in the framework of a collaborative research study ensured the gathering, as well as sharing, of all seminal knowledge about collective creativity and its surrounding context. Further, this knowledge was continuously adopted throughout the preparation of the survey questionnaire.

Organizational variables. As discussed, five organizational variables were considered following previous research (e.g. Shani et al., 2000; Mumford, 2000; Miron et al., 2004).

Table 2 illustrates the results of the factor analysis.

- **Structured processes:** Four scale items were used to measure ‘structured processes’. Items were taken from previous research to capture the fundamental characteristics of a structured work process for a team (Mumford, 2000). They include the definition of the task, the definition of autonomous boundaries, and the definition of roles and phases. The alpha coefficient for this measure was .78.
- **Diversity:** Three scale items were used to measure diversity between the people working for a collection. The items, consistent with previous research (Mannix and Neale, 2005), were identified within the joint research team about the ‘functional’ diversity of roles, competencies, and previous experiences at the company (e.g. past collections a person worked for). The alpha coefficient for this measure was .80.

- Boundary openness: Two scale items were used to measure ‘boundary openness’. This construct represents another issue about the team composition, and differs from Diversity because it concerns the extension of the collective work to clients, suppliers, and other external expertise (Shalley and Perry-Smith, 2008). The alpha coefficient for this measure was .73.
- Resources: Two items measured the level of resources assigned to the collection development. Resources within the specific context meant the budget for allocated time to the collection (because it represents the labour costs) and physical spaces available to the group (Miron et al., 2004; Moultrie et al., 2007). The alpha coefficient for this measure was .77.
- Technological support: Two items measured the level of technological support available within the group. The items concern the technological competencies of the individuals and the actual use of technology (Shani et al., 2000). The alpha coefficient for this measure was .75.

Insert Table 2 about here

Collective creativity. Four items measure collective creativity. The items are based on the conceptualization of collective creativity, focusing on the process of collaboration between people aimed to voice creative and original ideas (Hargadon and Bechky, 2006; Chaharbaghi and Cripps, 2007). In line with previous research (e.g. Barczak et al., 2010) this measure relies on the perceptions of the employees. Definition and characteristics of collective creativity were built as a result of the first research that included a final workshop on collective creativity involving all the organizational members of the design unit. Moreover,

before listing the specific questions in the survey, the respondents were given a coherent definition of collective creativity. The alpha coefficient for this measure was .81.

Individual creativity. For the scope of this research, individual creativity was measured through one item based on the self-perception of the level of individual creativity expressed at work and, accordingly to Pirola-Merlo and Mann (2004), before proposing the question, the respondents were given a consistent definition of individual creativity, as it was shared within the research team and with the pilot test participants.

Client satisfaction and economic results. The results achieved by a collection were measured via the perception of client satisfaction and economic results brought to the company. In line with Jiang and Zhang (2014), one specific item was used for each dimension of performance.

Control variables. Size of the group was not included as a control variable because it was similar for all the collections. Measures of age, job title, previous experiences at other companies, seniority at the company, and kind of employment contract were initially included as control variables; however, since no relationship was found between other predictor variables or performance, these controls were not included in hypothesis testing.

Results

Table 3 shows means, standard deviations and correlations among organizational variables, creativity variables and performance. Linear regressions were used to analyse the data. While predicted, the results about individual creativity and collective creativity ($r = .34, p < .01$) reveals a significant positive correlation.

Insert Table 3 about here

The first hypothesis was tested. The results, depicted in Figure 1, partially support Hypothesis 1. The model (R-squared = .65, $p < .00$) indicates a positive relationship between structured process and collective creativity ($\beta = .61$, $t = 9.32$, $p < .00$) and a positive relationship between technological support and collective creativity ($\beta = .32$, $t = 4.86$, $p < .00$). The other relationships are not statistically significant.

A new model, only including structured processes and technological support as independent variables, was tested. The output (R-squared = .65, $p < .00$) is illustrated in Figure 2.

Insert Figure 1 and 2 about here

The second hypothesis was tested (Hypothesis 2). The results, already included in Table 3, support Hypotheses 2. The correlation ($r = .34$, $p < .01$) indicates the *nexus* between individual and collective creativity, as predicted. The complex nature of this relationship does not allow us to assume any cause-effect relation between the two variables.

The data also show partial support for Hypotheses 3a and 3b (Figures 3 and 4) by indicating a positive relationship between collective creativity and client satisfaction ($\beta = .73$, $t = 9.84$, $p < .00$), and a positive relationship between collective creativity and economic results ($\beta = .32$, $t = 3.63$, $p < .00$). In line with the theoretical framework, individual creativity was included in the first model (R-squared = .47, $p < .00$) – revealing a negative relationship ($\beta = -.14$, $t = -1.91$, $p < .05$) while unpredicted. Similarly, individual creativity and client satisfaction were included in the second model (R-squared = .67, $p < .00$) – detecting a positive relationship concerning client satisfaction ($\beta = .55$, $t = 6.77$, $p < .00$) and no significant relationship concerning individual creativity ($\beta = .07$, $t = 1.12$, $p = .27$).

Insert Figures 3 and 4 about here

A new model including collective creativity and client satisfaction as independent variables (dependent variable: economic results) was tested. The resulting model (R-squared = .67, $p < .00$) is illustrated in Figure 5. These results also verified (according to Baron and Kenny, 1986) that client satisfaction has a mediator role (partial mediation) between collective creativity and economic results. Figure 6 illustrates a synopsis of the results.

Insert Figures 5 and 6 about here

Discussion and Implications

This section builds on the results and the proposed literature, illustrating two main areas of discussion: the key-organizational variables for sustaining the process of collective creativity and the impact of individual and collective creativity on organizational performance.

Key-Organizational Variables for Designing and Sustaining Collective Creativity

Among the five organizational variables, the two that have a relevant impact on collective creativity are structured processes and technological support. Diversity, boundary openness, and resources – while unexpected – have no relevant impact on collective creativity.

A structured process is an organizational aspect that needs to be accurately managed in order to foster the development of a successful collective and creative process. The literature on

collective creativity actually illustrates the relevance of process design in order to enhance collaborative dynamics (e.g. King and Anderson, 1990). This study underlines the importance of different elements: the more the task is defined, the phases and the roles are outlined, and the boundaries of autonomy of each role are clear, the more collective creativity will be exploited (e.g. Elsbach and Hargadon, 2006). These results confirm that interpreting collective creativity as a de-structured and boundary-less process would be ineffective. On the contrary, an appropriate design of the process is needed. Moreover, the results suggest that leaders who aim to enhance collective creativity should carefully plan phases and deadlines, communicate well-defined tasks, and assign specific roles within the micro social system (the team). The other relevant variable is the technological support. This organizational variable includes both the use of technological resources and the presence of technical competences within the micro social system. This result suggests that the conjoint design of social and technical systems can support collective creativity (Shani et al., 2000).

Additional considerations can be advanced considering the other variables. Diversity and boundary openness (in terms of different and external competencies and experiences) are about the choice of the people assigned or connected to the team. In literature, the role of diversity in enhancing collective creativity has been extensively debated (e.g. King and Anderson, 1990). Diversity often ‘appears to be a double-edged sword, increasing the opportunity for creativity as well as the likelihood that group members will be dissatisfied and fail to identify with the group’ (Milliken and Martins, 1996, p.403). The results do not emphasize the role of diversity in fostering collective creativity. In a managerial perspective, this may suggest that the driver to enhance collective creativity is the *micro socio-technical system* design, and probably not the specific choices about team composition and diversity. Moreover, the different level of resources (budget, time, space) seems to be irrelevant in regards to sustaining collective creativity. This result contrasts with some literature that

suggests, for example, that availability of resources (e.g. *time* in Hsu and Fan, 2010) enhances collective creativity. The results are consistent with the view that suggests ‘awareness’ of resources helps the micro social system to give a concrete form to their creative ideas (e.g. Bissola and Imperatori, 2011). In a managerial perspective, these results may suggest that, rather than an ‘abundance’ of resources, the resources need to be clearly defined and assigned at a certain adequate amount (structured processes).

Impact of Individual and Collective Creativity on Organizational Performance

The results confirm the complex and intimate *interconnection* between individual and collective creativity, but suggest that they have a different impact on organizational performance. Individual and collective creativity exist in an ‘and/both’ relationship (Chaharbaghi & Cripps, 2007) and this nexus goes beyond a simple cause-effect relation. In particular, a specific idea always comes from a specific person, but the real source is often an interaction between persons – for example an idea coming up from a dialogue between two individuals. The interactions trigger the event of individual creativity that, via interactions, triggers other events of creativity. This explains why, although correlated, a cause-effect relationship between individual and collective creativity do not emerge – differently from e.g. the conceptual framework of Woodman et al. (1993). The most relevant difference between individual and collective creativity – while unexpected – is the different impact on organizational performance, namely customer satisfaction and economic results. Collective creativity allows us to identify ideas that can satisfy the customer (in line with Rowatt et al., 1997). Surprisingly, individual creativity negatively affects client satisfaction. This seems to contradict results elsewhere in the literature on individual creativity in groups (e.g. Goncalo and Staw, 2006). The results suggest the relevance of collective creativity and the importance of an appropriate design of *micro social systems* (groups, teams, small collective entities)

within the organization (e.g. Hirst et al., 2009). Collective creativity has a direct and positive impact on economic results (not only mediated by client satisfaction). Collective creativity seems capable of dealing with effectiveness as well as positive economic results. This study suggests that the impact on these dimensions of performance coexist: a creative and collaborative *modus* has a positive impact on both (effectiveness and efficiency).

Implications and Conclusions

This article explores the concept of collective creativity and the purposeful management of it. Key organizational variables for sustaining collective creativity are identified and discussed (namely structured processes and technological support), while other variables seem less relevant (team composition, diversity, and level of resources). In particular, clarity about the work process, including the definition of the task, related phases/activities, related roles and their level of autonomy, plays a crucial role in enhancing collective creativity as this supports complex teams to focus on key relevant facts and issues. The support provided by relevant technology can also nurture collective creativity thanks to technological competencies and actual use of this technology. For these reasons, ‘creativity must be present at every level of every artistic and technical part of the organization’ (Catmull, 2008, p.66). Furthermore, the impact of collective creativity on organizational performance is confirmed. Collective creativity, more than individual creativity, has a positive impact on client satisfaction and economic results (both directly and indirectly via client satisfaction).

The *model of action* (Hatchuel, 2005) of collective creativity has implications for researchers and practitioners. Possible future research can be related to the specific field of collective creativity. Future studies might focus on other kinds of companies, in other countries and in other industries, in order to test the contextual conditions under which collective creativity can be enhanced. Other possible future research could be related to the development of the

proposed framework. A possible development could explore other organizational variables and performance not researched in this study. Further development in regards to the measures of collective creativity is another important area for future research.

The results are relevant not only for the scientific body of knowledge, but also have clear managerial implications. Indeed, the specific organizational variables developed and tested in this study can be a guiding format when aiming to manage and support collective creativity.

Furthermore, the relations between collective creativity and performance represent a specific management-related implication for companies that aim to sustain collective creativity in order to foster and support their competitive advantage.

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Table 1. Key characteristics of the roles in the design unit

| Role | Description of the role |
|-----------------|---|
| Product manager | The product manager is responsible for a specific collection and manages a small group of clients |
| Salesperson | The salesperson is responsible for a group of clients and gives strong support to the product managers in meeting the clients, examining sales data, and studying the markets |
| Designer | The designer is responsible for the creation (design) of the products and usually works for a specific client over a given period; the Atelier is the subunit that gathers the designers together and is led by a senior designer |
| Other experts | Other experts support product managers and designers in developing product design; they include brand managers, company Archive managers, colour experts (who try colour changes in textile printing), Jacquard experts, printing experts/technicians |

Table 2. Factor analysis for organizational variables

| | Structured processes | Diversity | Boundary openness | Resources | Technological support |
|--------------------------------|-----------------------------|------------------|--------------------------|------------------|------------------------------|
| Role definition | .81 | .12 | .03 | .01 | .39 |
| Phases definition | .81 | .10 | .06 | -.11 | .07 |
| Task definition | .69 | .26 | .20 | .33 | -.06 |
| Autonomy definition | .67 | .03 | -.18 | .25 | .06 |
| Diversity of competencies | .07 | .84 | -.06 | .08 | .26 |
| Diversity of roles | .19 | .89 | -.06 | .17 | .01 |
| Diversity of experiences | .12 | .73 | .29 | .17 | .18 |
| Client/supplier involvement | .04 | .05 | .86 | -.04 | .19 |
| External resources involvement | -.02 | .02 | .86 | .17 | -.05 |
| Physical spaces | .10 | .09 | .06 | .88 | .14 |
| Budget for allocated time | .11 | .25 | .08 | .82 | .10 |
| Use of technology | .05 | .17 | .06 | .19 | .86 |
| Technological competencies | .24 | .18 | .08 | .05 | .85 |

Factor Analysis. Extraction Method: Principal Component Analysis.

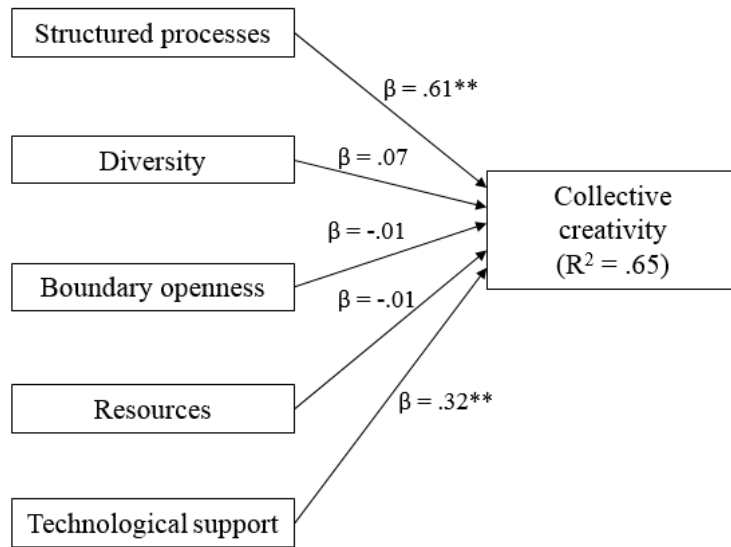
Rotation Method: Varimax with Kaiser Normalization. Total variance explained: 75.87%

Table 3. Organizational variables, creativity, and performance: means, standard deviations, and correlation coefficients

| | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------------------------|------|------|-------|-------|------|-------|-------|-------|-------|-------|---|
| 1 Structured processes | 4.07 | 1.00 | | | | | | | | | |
| 2 Diversity | 3.99 | 1.06 | .36** | | | | | | | | |
| 3 Boundary openness | 2.44 | 1.26 | .09 | .14 | | | | | | | |
| 4 Resources | 3.61 | 1.17 | .32** | .39** | .23* | | | | | | |
| 5 Technological support | 4.11 | 1.14 | .36** | .40** | .21* | .35** | | | | | |
| 6 Collective creativity | 3.90 | 1.01 | .74** | .40** | .12 | .31** | .55** | | | | |
| 7 Individual creativity | 3.83 | 1.19 | .38** | .15 | .09 | .12 | .08 | .34** | | | |
| 8 Client satisfaction | 3.89 | 1.38 | .61** | .29** | .07 | .28** | .39** | .68** | .12 | | |
| 9 Economic results | 3.47 | 1.45 | .52** | .23* | .14 | .27** | .37** | .72** | .29** | .78** | |

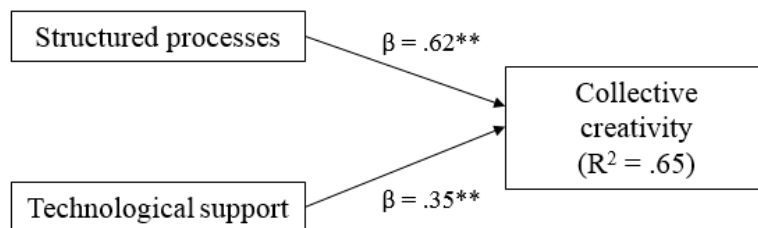
*p<.05; **p<.01

Figure 1. Model of organizational variables effect on collective creativity



* $p < .05$; ** $p < .01$

Figure 2. New model of organizational variables effect on collective creativity



* $p < .05$; ** $p < .01$

Figure 3. Model of creativity effect on client satisfaction

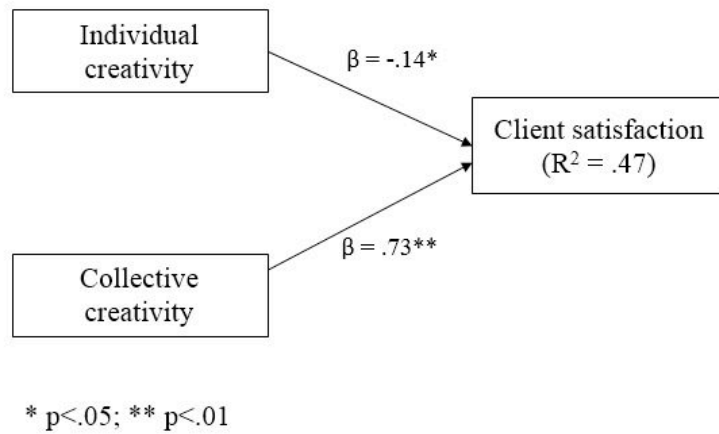


Figure 4. Model of creativity and client satisfaction effect on economic results

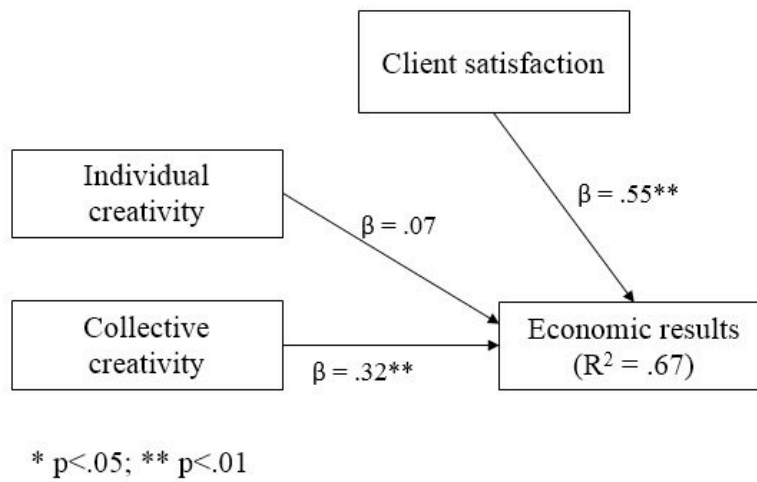


Figure 5. New model of creativity and client satisfaction effect on economic results

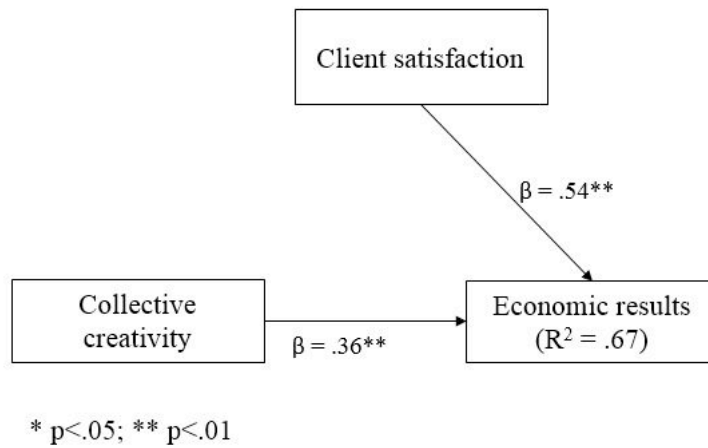


Figure 6. A synopsis: Partial illustration of the results

