

How artists create: Creative process and multivariate factors[☆]

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ABSTRACT

This study sought to identify the factors that artists consider important for their creativity and to reconstruct, from interviews, the stages of their creative activity. For this purpose, 27 interviews with professional artists were analyzed using a double approach. First, a quantitative analysis of interviews and associated self-report questionnaires was performed. Second, a qualitative coding grid was applied to a representative subset of the interviews to uncover stages of activity and the interaction between creator and the material and social world. Results are discussed according to the multivariate approach and in light of activity theory and its emphasis on situated, goal-directed and meaningful action. Findings concerning the creative process and the factors involved are finally considered with respect to teaching creativity and art.

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1. Introduction

The visual arts have traditionally been treated as a major domain of creative activity and were the subject of some of the first empirical studies of creativity, such as Patrick's seminal research (Patrick, 1935, 1937). Creativity, defined as the ability to produce new and adapted ideas to a situation (Sternberg & Lubart, 1999), has been traditionally represented in terms of four components: the person, the process, the press and the product (Ekvall, 1999; MacKinnon, 1978; Mooney, 1963; Plucker & Renzulli, 1999; Rhodes, 1961; Richard, 1999; Runco, 1999). In this article, the Four Ps are examined through interviews with artists, paying attention to the creative person and process and trying to answer questions such as: which factors are involved in artistic creativity, which personal characteristics could differentiate artistic activity (gender, artistic domain, artistic experience), and how do artists describe their creative process? Engaging a double analytical perspective – semantic and qualitative analysis – we aim to study the creative person and creative process simultaneously, which represents a first attempt of this kind and contributes to the originality of the present investigation.

Concerning the person, the multivariate approach to creativity describes four main components of interest: cognitive, conative, emotional and environmental factors (Lubart, Mouchiroud, Tordjman, &

Zenasni, 2003). Particular attention was also granted here to the creative process as a form of activity or action (Dewey, 1934). For example, observing the artistic creative process, Getzels and Csikszentmihalyi (1976) identified a problem formulation stage (pre-drawing activity) and a problem solution stage (drawing and feedback activities). Various moments or phases of the creative process have been investigated using several theoretical frameworks and methodologies, and the research presented in this report adds to this growing body of work.

2. Creative person

The profile of creative people, artists especially, has been extensively studied (Batey & Furnham, 2006; Feist, 1998; Furnham, Batey, Booth, Patel, & Lozinskaya, 2011). However, the cognitive, conative, emotional and environmental characteristics of creators were mainly investigated separately in the past. According to the multivariate approach, the creative person is defined by a combination of cognitive, conative and emotional components associated with favorable environmental conditions (Amabile, 1983, 1996; Gardner, 1993; Lubart, 1999; Lubart et al., 2003; Sternberg & Lubart, 1991, 1995).

The *cognitive component* corresponds to the intellectual abilities involved in creativity. Lubart et al. (2003) proposed a summary of cognitive capacities including synthetic capacities of identification, definition and redefinition of the problem. Also, selective encoding permits the selection of relevant information for solving the problem. The selective comparison ability helps one to observe similarities between various domains. In addition, the creative person makes associations between the ideas collected (selective combination).

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Several researchers have proposed an elaboration–evaluation cycle in which ideas are perpetually generated and judged (see [Bonnardel, 1999](#)). These cognitive capacities favor the emergence of a creative solution.

The *conative component* concerns personality traits and motivation. Creative individuals are usually described as open to new experiences ([Barron, 1969](#); [Feist, 1998](#); [Furnham & Bachtiar, 2008](#); [Gough, 1979](#); [MacKinnon, 1965](#); [McCrae & Costa, 1987](#); [Wolfradt & Pretz, 2001](#); [Zenasni, Besancon & Lubart, 2008](#)). Openness is reflected in a dynamic fantasy life, esthetic sensibility, emotional awareness, need for originality, intellectual curiosity, and a strong personal value system ([Helson, 1999](#)). Creative people are also tolerant of ambiguity ([Barron & Harrington, 1981](#); [Levy & Langer, 1999](#); [Sternberg & Lubart, 1995](#); [Tegano, 1990](#); [Zenasni & Lubart, 2001, 2008](#)). In a meta-analysis of personality traits for scientific and artistic creativity, [Feist \(1998\)](#) showed that artists are characterized by: openness to new experiences, fantasy, and imagination; and a lively, ambitious and nonconformist nature.

The *emotional component* of the multivariate approach corresponds to emotional traits and states ([Botella, Zenasni, & Lubart, 2011a](#); [Zenasni & Lubart, 2008](#)). For example, emotional clarity and the capacity to perceive feelings are positively correlated with creative performance ([George & Zhou, 2002](#)). Also, emotional intelligence allows a better perception of the emotional environment, thus favoring creative outputs. Examining the link between emotional intelligence and creative personality, [Wolfradt, Felfe, and Koster \(2002\)](#) observed moderately strong correlations between the two (from $r = .36$ to $r = .55$, $p < .01$). In artistic creativity, [Feist \(1998\)](#) indicated that artists, compared to scientists, tend to be more emotional, anxious, emotionally unstable and to have a strong sensibility.

Finally, the multivariate approach emphasizes the *environment* which offers physical and/or social stimulations and can help the generation and maturation of ideas, thus reinforcing motivation ([Lubart, 1999](#)). The environment includes the appreciation of creativity through social judgment. For [Sternberg and Lubart \(1995\)](#), creativity involves more than a sum of all these components: certain constituents can partially compensate each other. For example, a strong degree of motivation can mitigate a lack of knowledge. These components interact among themselves; the combination of high intelligence and strong motivation may enhance creative performance in a multiplicative manner. Thus, the multivariate approach focuses attention on the various constituents involved in artistic creative activity and aims to examine the interactions between them.

In addition to the multivariate approach, some personal characteristics, such as gender, age or creative domain, have also been examined. For example, there is no gender difference when it comes to the creative performance ([Baer & Kaufman, 2008](#); [Kogan, 1974](#)). However, males and females are not equal in terms of their tendency to experience life events. [Tieso \(2007\)](#) showed that females feel emotions more intensively and experience more life events with their senses than males do. Moreover, as noted in [Feist \(1998\)](#), creative people present different personality traits according to the creative domain. In this regard, years of artistic experience could explain personality differences between younger and older artists ([Botella, Zenasni, & Lubart, submitted for publication](#)). In the present study, the creative person was examined through the lenses of the multivariate approach, with personal characteristics of artists (gender, age, artistic experience) taken into accounts.

3. Creative process

In addition to the multivariate approach to the creative person, a focus on the creative process refers to the study of “the succession of thoughts and actions that lead to original and adapted ideas” ([Lubart et al., 2003, p. 85](#)). In this regard, the creative process refers to the application of the creative ability of the person to a creative type of production.

Originally, the first model of creative activity was based on introspective reports of eminent creators and described four main stages ([Wallas, 1926](#)):

- 1) *preparation*, based on exploring the problem and acquiring knowledge;
- 2) *incubation*, characterized as a period of latency and subconscious activity;
- 3) *illumination* or the “Aha! moment”, in which the sudden appearance of a creative solution takes place;
- 4) *verification*, in which the validity and utility of the solution are being tested.

From the mid-twentieth century, cognitive approaches to the creative process focused on revealing the psychological mechanisms that make creativity possible. For example, the *Geneptore model* ([Finke, Ward, & Smith, 1992](#)) highlighted the *generative* and *exploratory* phases. The generative phase concerns the construction of mental representations (preinventive structures). These structures take the form of various mental patterns, forms, category exemplars and mental models as well as verbal combinations ([Finke, 1996](#)). Following their generation, the exploratory phase allows these structures to be interpreted and thus leads to creative insights and discoveries. Recent models have expanded the interaction between generation/selection processes and searching/retrieving relevant information for solving problems ([Bink & Marsh, 2000](#)). However, the creative process involves more than cognitive components alone ([Botella, Zenasni, & Lubart, 2011b](#)) and is not exclusively individual-based. The creative person cannot be separated from his or her environment or particular situation and an adequate model of creative process needs to take into account features of the social and material world.

Defining creativity as an *action* or a type of *activity* ([Dewey, 1934](#); [Leont'ev, 1978](#)) allows us not only to observe the articulation between psychological functions and their externalization, but also brings a new emphasis on the temporal dimension of creative processes and thus facilitates the analysis of stages in creative work. These original conceptions concerning human activity were developed by different theorists belonging mostly to the cultural or socio-cultural orientation in psychology ([Boesch, 1997](#); [Cole, 1996](#); [Wertsch, 1998](#)). For them, human activity is goal-directed (intentional), symbolic (mediated by systems of signs and tools), and situated (related to a specific context). When analyzing activity one needs to pay attention to its systemic nature, the stages and types of actions and operations it incorporates, each with its set of goals and sub-goals. Understanding the creative process in terms of a series of actions has therefore a number of benefits for the psychology of creativity (see also [Sawyer, 1995](#)). First, it *situates* creative processes and observes their relational nature. Second, it calls for an articulation of different elements and levels of analysis and moves the focus from the creative individual to the ‘*in between*’ space of creator and environment, creator and society. Finally, it leads to a more *comprehensive* view of these processes in their double psychological and behavioral manifestation. As such, the action and multivariate approaches can be related and contribute mutually to understanding creativity. In the present study, stages in the creative process were identified through a qualitative analysis of artists' discourse.

4. Aim of the study

The purpose of this study was to examine the factors engaged in artistic creativity and to describe the creative process based on artists' narrative accounts of their work in order to advance our understanding of creativity in art, a type of knowledge that can be put to practical use including in the teaching of art. Concerning the person, the multivariate approach to creativity emphasizes the combination of different components involved: cognitive, conative, emotional and environmental. Based on the conceptualization of the creative process as a form of activity ([Cole, 1996](#); [Wertsch, 1998](#)), we constructed a framework for

analyzing the interviews, the stages of activity and interconnection between creative work and the material and social environment of the artist.

The more specific objectives of this study were: (1) to explore the ways in which professional artists describe their work and identify favorable or unfavorable factors for artistic creativity, (2) to examine the personal characteristics that can explain differences in their accounts of artistic activity (gender, artistic domain or artistic experience), (3) to understand further the factors involved in the production of art through the use of a questionnaire, and (4) to differentiate the stages of creative artistic activity.

Professional artists were interviewed in order to investigate factors influencing artistic creativity and to understand the creative process as expressed in artistic activity. For this purpose, the present study is based on the spontaneous discourse of artists regarding the cognitive, conative, emotional and environmental components that can influence their creativity and the stages of their artistic activity.

5. Method

5.1. Participants

The sample consisted of 27 professional artists, who make a living based on their artistic activity. The sample included 18 men and 9 women. On average, the artists were 46 years old ($m = 46.36$ years; $s = 8.71$; $range = 30$ – 66 years). They had considerable artistic experience ($m = 22.8$ years; $s = 7.35$; $range = 5$ – 35 years) and enjoyed institutional recognition (by galleries, art centers, FIAC or the International Fair of Contemporary Art, and/or by the superior establishments of art education such as university art departments or art schools). The artists were engaged with various domains of the arts: 8 painters, 7 digital artists (photography, video, and net-art), 6 sculptors, 4 multidisciplinary artists, and 2 draftsmen. All participants were French with the exception of two (Spanish and German) who were also fluent in French and were French residents.

The qualitative part of the project, aiming to uncover the stages of creative activity, was based on interviews with a subset of the sample ($n = 12$) given the laborious nature of qualitative analyses (see Gaskell & Bauer, 2000). This subgroup reflected the characteristics of the total sample and consisted of seven male and five female respondents, with mean age of 47 ($sd = 9.03$) and mean work experience of 23.5 years ($sd = 13.75$). Within this sub-sample, 5 artists were engaged in sculpture, 4 in painting (with some overlaps), and 3 in photography, video or drawing. All of them were French artists.

5.2. Material

5.2.1. Interview guide

The interview guide included 17 questions organized in four sections (see Table 1 for examples): (1) a general presentation of the artist; (2) a description of his/her artistic activities (works); (3) a reflection on the creative process which included a description of their approach to creating and description of their most creative/successful productions; and (4) a description of the artist's status in society. To avoid generalizations and vague descriptions, the third part of the interview guide was based on the critical incident technique that invited participants to describe a very creative activity (Flanagan, 1954).

5.2.2. Questionnaire

To estimate factors involved in artistic creativity, a questionnaire was constructed based on the F-JAS (Fleishman Job Analysis Survey; Fleishman & Reilly, 1992). This survey is especially used in work psychology to assess the capacities and traits relevant to a job (Fleishman & Mumford, 1991). Based on the F-JAS structure, the factors potentially involved in creativity according to the literature on the multivariate approach were described. Factors were proposed by a group of 10

Table 1
Samples of questions from the interview guide.

Section 1: General presentation of the artist
How you would present yourself briefly?
Did you have a specific education in art?
Section 2: Description of his/her works
What kind of artistic works do you produce mainly?
Do you have preferential tools, mediums, supports or materials?
Section 3: Thinking about the creative process
Can you describe how you create a production?
Do you consider that there are several stages in your creative work? If yes, could you describe what these stages are for you?
According to you or others, what is your most important, most original and most creative work? Can you describe how you created this particular work?
What was the starting point of this production? What was the place of the inspiration in your work?
Section 4: Place of the artist in the society
As artists, do you think of having to make something new, original, or never seen previously?
What is the proportion of your time which you dedicate to issues related to the administration and promotion of your work?

researchers, experts in the creativity field (active published researchers), in order to generate a new questionnaire measuring 39 characteristics: 10 characteristics corresponded to the cognitive component, 13 to the conative component, 10 to the emotional component, and 6 characteristics corresponded to the environmental component. As in the case of the classic F-JAS, every characteristic was accompanied by a short definition. For example: selective combination is defined as the capacity to associate two elements of information which, together, allow generating new ideas. Participants indicated on a 7-point scale the importance of each characteristic for their creative activity (from 1 = not important to 7 = very important). This questionnaire was constructed for this study in order to explore factors involved in the artistic activity. The response rate was good (85% of return rate corresponding to 23/27 artists).

5.3. Procedure

An appointment was made with the artists, by e-mail or by phone, during which the study was briefly presented. Then, artists were interviewed in their studios or their homes, allowing them to show their artworks if they wished. Before starting, the interviewer presented in detail the research and its objectives. The interviews were semi-structured and lasted for 90 min on average ($s = 34$ min; $range = [72$ – 143 min]). All interviews were recorded with the consent of the participants (with guaranteed anonymity), then transcribed verbatim with the inclusion of onomatopoeias, pauses, etc. At the conclusion of the interview, the researcher administrated the questionnaire and invited the artists to complete and return it using a pre-stamped envelope at their earliest convenience.

5.4. Methods of analysis

5.4.1. Semantic analysis

Based on Propositional Discursive Analysis (PDA; Ghiglione & Blanchet, 1991), Cognitive-Discourse Analysis (see Ghiglione, Landré, Bromberg, & Molette, 1998) considers units of people's discourse. In this study, the Tropes software (Version 8.0, 2011) was used to conduct content analyses. This type of analysis is currently employed in various disciplines, such as ergonomics (Visser & Wolff, 2003; Wolff, Burkhardt, & De la Garza, 2005) and clinical psychology (Poussin, Blattier, Le Quang, & Monti, 1997; Wolff, Gattegno, & Adrien, 2005, 2009) because it reduces the subjectivity of the research process.

Various linguistic indicators defined the discursive style used by the speaker. The style was identified by comparing the discourse to "linguistic production standards". Stored in the dictionaries of the software, these standards were obtained by analyzing a large number

of different texts (interviews, press articles, novels, etc.). In the current study, all interviews were argumentative, confirming the fact that all collected interviews were comparable (belonging to the same style) and that artists focused on argumentation rather than a simple description of events or situations. An argumentative style reveals that the subject makes a commitment, argues, explains or criticizes and generally tries to persuade the interlocutor.

At the level of semantic analysis, Tropes contains dictionaries including more than 300,000 semantic classifications and 20,000 reference universes (Piolat & Bannour, 2009). The predefined word classifications, called “reference universe”, corresponded to concepts and related terms that are theoretically close. Every universe consisted of a set of semantic equivalents which can be modified or completed by the analyst according to the operational language used (“coded” language used by the same community and not easily understandable by others outside the community); as such, a reference universe included names, verbs, adverbs, adjectives and connectors (subordinating conjunction).

All reference universes adopted for the analysis of a certain corpus in Tropes form a *scenario*. Thus, the scenario of the interviews was built by both the semantic universes supplied by Tropes and through the modifications and/or additions made “manually” based on the analyst’s knowledge of the speakers’ operational language. For this study, according to the methodology used in previous research (Visser & Wolff, 2003; Wolff, Gattegno, & Adrien, 2005; Wolff et al., 2009), a standard Principal Component Analysis (PCA) was used to determine if personal characteristics (e.g. genre or level of experience of the artists) account for differences in discourse.

5.4.2. Qualitative analysis

Complementing the semantic analysis, a qualitative coding of 12 interviews from the general sample was performed. If semantic analysis strives to eliminate subjectivity from the process of analysis, thematic coding (see Attride-Stirling, 2001) depends, to a larger extent, on the skills and appreciation of the analyst, while being firmly grounded in the narrative material under investigation. This was achieved through the construction of a framework that is at the same time *data and theory driven*. In this case, the theoretical background was offered by activity theory with a special focus on the stages of action and their interconnection to aspects of the material and social world.

The global themes that guided the construction of the framework had been initially those of ‘action’, ‘material world’ and ‘social world’. In addition, ‘motivation’ was also coded (the needs and goals of the creator) as well as ‘obstacles and difficulties’ faced while working. As mentioned before, the goals of the actor are important for activity theory and so is everything that goes against their realization. Finally, ‘emotional outcomes’ were also considered, as a result of advancing through the different stages of the creative process and facing the inherent challenges of each work phase. This basic structure was inspired by the work of John Dewey (1934), an American pragmatist who conceptualized artistic creation in terms of a *continuous cycle of doing and undergoing*; acting on the world and ‘taking in’ the reaction of the world to one’s doing.

However, the final framework was also data driven and, after applying it to the first three interviews, the categories were enriched with subcategories and their definition clarified. For example, new codes were created to capture the ‘undergoing before doing’ aspect which comprised artists’ preparation for creative work (e.g., university training, visiting museums and exhibitions, and paying constant attention to the surrounding environment). ‘Undergoing the final result’ was also a distinctive aspect commented on by respondents. This included the reaction of the artist to the finished work of art and his or her evaluative judgements concerning it. Finally, the ‘action’ code was broken into a series of sub-codes referring more directly to stages of the activity, procedures employed while working, the time and place of working and the materials used in the creative process.

The analysis started from the verbatim transcription of the interviews and was aided by the qualitative software Atlas.ti (allowing text annotation but not generating codes or initiating their application). To ensure consistency in coding, and as a supplementary measure for subjective bias reduction, all interviews were double coded and the overall agreement between coders was 93% (the instances of disagreement were then settled in light of the framework and its definitions). After the analysis phase was completed, all quotations were retrieved and summarized by the second author for each one of the codes. The outcome is a schematic representation of artistic activity outlining its main stages and relating them to the social and material contexts of creative work.

6. Results

In the semantic analysis, as the first step, the universes of reference were extracted and particular attention was paid to facilitating and inhibiting factors based on the multivariate approach. Second, a principal component analysis was conducted to examine the presence of personal characteristics in the discourse of artists. Third, the analysis of the discourse was examined based on questionnaire data. Finally, qualitative coding was used to explore the artistic creative process as a type of activity.

6.1. Semantic analysis

6.1.1. Universes of reference

The Tropes software allows counting automatically the most frequent semantic references which appear at least three times in the set of interviews. Once the semantic references were generated, we added the operational language to complete the scenario. Finally, we created a scenario composed of nine main reference fields: facilitating factors, inhibiting factors, creative process action, creative process cognition, artistic education, social world, art world, art work and material.

The *facilitating factors* universe grouped terms that had a positive impact on the artists’ creativity according to their discourse. This universe involved cognitive components (intelligence, knowledge or memory, etc.), conative components (curiosity, spontaneity and sincerity, etc.), emotional components (satisfaction, happiness, frustration, or anger, etc.) and environmental components (space, luminosity, need to be alone, in a “bubble”, etc.).

Inhibiting factors referred to the environment and features such as constraints, codes, rules, risks, finances and deadlines. The multivariate approach was also relevant in terms of cognitive (contradictions, illusions and uncertainties, etc.) and emotional components (fear and guilt, etc.). Nothing mentioned in the artists’ discourse made reference to conative components as an inhibiting factor. Failure, abandon, destruction, and stagnation were also referenced in this universe.

Creative process/action referred to the succession of actions leading to creative production. This universe included specific terms in the artistic domain such as “to brush”, “to outline” or “to paint”, etc. It also included the notion of do-it-yourself, round trip, trials, tests and experiments. Creative process/action referred also to the executing, realizing, manufacturing and gesturing to create a production. This universe included also the finalization, presentation (e.g., at exhibitions) and validation of work.

Creative process/cognition concerned the succession of thoughts ending in a production. This universe included the combination of ideas, assembly, association and metaphors, etc. The emergence of an idea was perceived as a shock, hallucination, revelation or spark which appears from nowhere. Some artists spoke about the famous “Eureka” experience. This universe corresponded also to planning, elaborating, preparing and searching for ideas or information.

The interview guide invited artists to describe their education: some were self-taught and others attended art schools. Their level of study varied (e.g., bachelor’s degree, master’s degree, and PhD).

Sometimes, the artists received training in other disciplines such as architecture, chemistry, history, engineering or sciences. All these references belonged to the universe of *artistic education*.

The *social world* included the personal and professional environment. The personal environment was composed of friends, life partners, family and close relations, etc. The professional environment consisted of assistants, directors of photography, customers, collectors, art critics, gallery owners, public and visitors.

The next semantic universe consisted essentially of descriptive references which do not imply a reflection of the artist. The *art world* designated exhibitions, conferences, and private shows and concerned the professional universe in which the artists evolve. In addition, this universe made reference to mediums (fine art, paint, calligraphy, and music, etc.), kinds of art (abstract, self-portrait, representational, narrative, etc.), the artists themselves (creator, plastics technician, etc.), and references to other artists (Picasso, Monet, Bacon, etc.). The *art work* universe indicated the form of the output (square, cubic, geometrical, graphic, etc.) and its material support (frame, paper, board, painting, etc.). *Material* grouped tools (scissors, glue, pencils, Internet, hand or computer, etc.), and materials (wood, metal, color, or paint, etc.) that made artistic work possible (performance, play, result, product, picture and works, etc.).

6.1.2. Facilitating and inhibiting factors

Conative components did not appear among inhibiting factors. In terms of facilitating factors, the artists mentioned primarily three components (cognition, conation and emotion). The reading of these sub-universes had to be clarified according to the multivariate approach. The number of references made for the three sub-universes during every interview was calculated. First, this number was examined with regard to the sum of the three sub-universes (percentage by line with the sum by line equal to 100%, see Table 2).

The line percentages indicate that when the artists spoke about factors facilitating their creativity, they mentioned equally the cognitive (39.07%), conative (28.13%) and emotional components (32.8%). However, when artists evoked factors inhibiting their creativity, they spoke mainly about emotional components (77.24%).

Additionally, the number of references to the 3 sub-universes during every interview was examined with regard to the sum of facilitating and inhibiting factors (percentage in columns, see Table 3). Results indicate that cognitive and conative components were essentially mentioned as being favorable to creative work (respectively 82.72% and 100%, respectively). The results were mixed for the emotional components (favorable 54.22% and unfavorable 45.78%).

6.1.3. Principal component analysis (PCA)

A standard PCA was conducted on the data provided by Tropes. First, an analysis of the variables showed the reference fields evoked by the artists, in association with the Word categories that characterize their descriptions. Second, the interpretations of this first analysis were related to individuals' characteristics. Six active variables were involved in the construction of the axes: facilitating factors, inhibiting factors, creative process action, creative process cognition, education and social world. Three supplementary variables did not intervene in the construction of axes because they were descriptive in nature: art world, art work and material. Although the descriptive variables were not involved in the construction of axes, they were useful for the interpretation. The three axes accounted for 73.08% of the

Table 2

Percent in line (references to cognitive, conative and emotional components according to the sum of these 3 sub-universes).

	Cognition	Conation	Emotion	
Facilitating factors	39.07%	28.13%	32.80%	100%
Inhibiting factors	22.76%	–	77.24%	100%

Table 3

Percent in column (references to facilitating and inhibiting factors according to the sum of the facilitating and inhibiting factors).

	Cognition	Conation	Emotion
Facilitating factors	82.72%	100%	54.22%
Inhibiting factors	17.28%	–	45.78%
	100%	100%	100%

variance of the initial protocol. For each characteristic, Z-scores were calculated to compare groups based on gender, art domain and experience.

Results showed that women talked more about their education ($Z = 0.37$) and their social world ($Z = 0.67$) than men did ($Z = -0.19$ and -0.34 respectively). In terms of the art domain, there were five categories: painters, sculptors, draftsmen, digital artists, and multidisciplinary. Results indicated that the digital artists and sculptors talked relatively more about the facilitating factors ($Z = 0.28$ and $Z = 0.54$ respectively) and creative process cognition ($Z = 0.83$ and $Z = 0.33$ respectively), whereas painters referred less to these universes ($Z = -0.50$ and $Z = -0.67$ respectively). Painters mentioned preferentially the material ($Z = 1.07$), the creative process action ($Z = 0.56$) and art work ($Z = 0.14$). Sculptors talked more about their education ($Z = 0.59$) and less about their social world ($Z = -0.26$); on the contrary, multidisciplinary artists referred more to their social world ($Z = 0.56$) than to their education ($Z = 0.13$).

Finally, the art experience variable consisted of four levels: (a) artists with less than 10 years of experience in art, (b) artists with 10–19 years, (c) artists with 20–29 years, or (d) artists with more than 30 years of art practice. Results indicated that artists with 20–29 years of art experience talked about inhibiting factors ($Z = 0.59$), the art world ($Z = 0.32$) and moderately about their social world ($Z = 0.06$), whereas artists with more than 30 years of art experience referred more to facilitating factors ($Z = 0.54$) but somewhat less to the creative process cognition ($Z = -0.11$). Also, artists with less than 10 years of experience mentioned their education ($Z = 1.01$) and moderately the creative process action ($Z = 0.06$). Finally, artists with more than 30 years of experience in art talked more about their education ($Z = 0.16$) and their social world ($Z = 0.29$) than others groups and other universes.

6.2. Questionnaires

The artists' discourse allowed factors important for their creativity to be extracted. Results from the questionnaire data offered additional information for the multivariate approach. Descriptive analyses indicated that the cognitive component was the most important ($m = 5.69$; $sd = 0.83$), more than the conative component ($m = 4.94$; $sd = 0.54$), the environment ($m = 4.80$; $sd = 0.91$) and, finally, the emotional component ($m = 4.30$; $sd = 0.62$). "Selective combination" appeared essential for artistic creativity ($m = 6.39$; $sd = 1.16$) (Getz & Lubart, 2000) (see Table 4 for more results). Also, "self-criticism" allowed to begin to estimate the work and to envision possibilities of improvement ($m = 6.35$; $sd = 0.83$).

In contrast, according to the artists, the social aspects were not essential for their creativity: sociability ($m = 1.91$; $sd = 0.83$) and extraversion ($m = 2.87$; $sd = 1.69$) were not seen as especially necessary for creation.

To complete these results, a correlational analysis between the average rating on each component of the questionnaire and the frequency of the reference universes revealed two links: the more the artists estimated that the cognitive component was important for their creativity, the more they talked about the creative process cognition universe ($r = .52$, $p < .05$); and the more they considered the emotional component in the questionnaire, the more they mentioned the creative process action universe ($r = .50$, $p < .05$) and

Table 4
Descriptive statistics for the most and least important factors based on the questionnaire data.

Component	Item	M	SD	Min	Max
Cognitive	Selective combination	6.39	1.16	2	7
Conative	Self-criticism	6.35	0.83	5	7
Conative	Search for sensations	6.27	1.10	4	7
Conative	Openness to new experiences	6.22	1.17	3	7
Conative	Risk-taking	6.17	1.27	2	7
Conative	Intrinsic motivation	6.17	1.34	2	7
Conative	Individualism	6.13	1.29	2	7
Cognitive	General intelligence	6.09	1.24	2	7
Conative	Perseverance	6.04	1.11	3	7
Cognitive	Selective comparison	5.91	1.54	2	7
Cognitive	Divergent thinking	5.91	1.68	1	7
Emotional	Emotional expressiveness	3.78	1.81	1	7
Emotional	Emotional regulation	3.74	1.69	1	7
Conative	Humility	3.65	1.67	1	6
Environmental	Important events	3.64	2.22	1	7
Conative	Agreeability	3.57	1.78	1	7
Conative	Warmth	3.55	1.51	1	6
Conative	Extrinsic motivation	3.39	1.44	1	6
Conative	Need of closure	2.87	1.63	1	6
Conative	Extraversion	2.87	1.69	1	6
Conative	Sociability	1.91	0.83	1	3

the less they referred to creative process cognition ($r = -.44$, $p < .05$).

A cluster analysis identified three groups (see Fig. 1). The artists of the first group ($n = 7$) considered that the four components of the multivariate approach were equally important. This group comprised a well-balanced number of artists from every domain (one painter, one sculptor, one digital artist, one draftsman, and two multidisciplinary artists). The second group ($n = 7$), including mainly painters ($n = 4$), estimated that the cognitive component was the most important ($Z = 0.41$), compared to the conative ($Z = 0.10$), the emotional ($Z = -0.29$), and finally the environmental one ($Z = -0.62$). The last group ($n = 9$), including 4 digital artists, evaluated the cognitive component as most important ($Z = 0.72$) whereas the emotional components ($Z = -0.70$) were less so and conative ($Z = -0.03$) and environmental components were situated in the middle ($Z = 0.07$). Thus, the three groups differed significantly on cognitive ($F_{(2)} = 1.69$, $p < .001$), emotional ($F_{(2)} = 1.43$, $p < .001$) and environmental components ($F_{(2)} = 2.67$, $p < .001$) but not regarding their appreciation of conative components ($F_{(2)} = 0.08$, *ns*).

6.3. Qualitative coding

Qualitative coding and the analysis of quotations for each of the action codes were useful in reconstructing the activity flow as depicted by respondents. Before presenting the general stages of

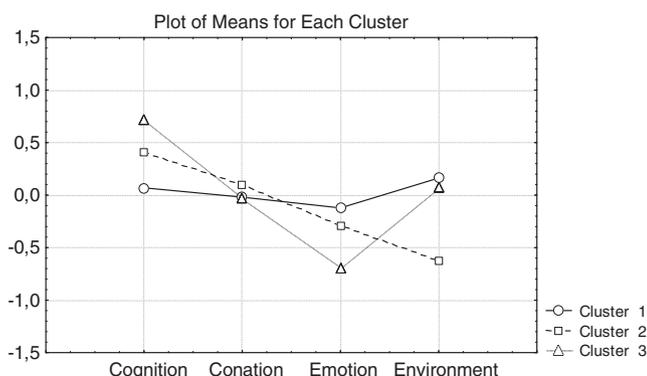


Fig. 1. The three cluster groups based on the results of the questionnaire.

artistic creative action, it is important to note that the observations that follow result from an effort of generalizing what has been said (see Fig. 2), and therefore may not reflect each individual interview.

The *motivation or impulsion* of artists, the starting point of any form of activity, was intrinsically linked to the need 'to make' (to build, to give form) and to 'handle' different materials. Artists were also motivated to create, transform and experiment, to "generate a surprise" through their work. Finally, another category of motives related to a need to express and communicate ("a narrative desire"). The elaboration of such a strong motivational basis had a history, often one leading back to the years of childhood when several of the respondents were already engaging in arts and wanting to become an "artist". Such *undergoing before doing* was completed by formal education and by constant attention paid to the surrounding universe and the works of others. "The first stage [of a work of art] is life", said one of the participants, and through this reflected a general opinion that artists had to always be receptive, like "sponges", impregnated by things and people. "Encounters" took place not only with people but also with ideas, during exhibitions, reading, watching the cinema, taking walks, going by metro, etc.

Overall, art making activity seemed to involve six distinguishable stages:

1. The creative process began with *an idea or a "vision"*. This first creative idea comes after a period of void, of wandering and could be triggered by an image, a sight, a sound that resonates with what had "matured" inside the artist for a long time. These initial ideas were general in nature and they became more "specific" or "concrete" during the next stages. Artistic visions were often not personal but interpersonal; they required the look of the other from the very beginning, especially partners and close collaborators. *Social forms of undergoing* played an important role from the start and the opinion of "significant others" remained a crucial point of reference throughout. Finally, a strong *emotional* component accompanied the first stage. Getting an idea was both exciting and pressing for the artist, who then became engaged in what was often a long term project.
2. A second phase was *documentation and reflection*. Most visions were incomplete and needed careful consideration that amounted to an "incubation" phase. At this stage, artists sometimes needed to gather more information about the materials and technologies required in order to turn their vision into reality. A potential *obstacle* in this regard had to do with the incapacity to visualize, to capture the essence of the future work of art. This was close to the notion of a lack of inspiration, a "block", something that could intervene in subsequent phases as well. Concerning the *time and place* of working, respondents discussed the irregularity of creation, the fact that one cannot have a schedule, cannot force inspiration or have "office hours". Whereas artists tend to be constantly thinking about their project, the usual working place was their studio.
3. The third moment was represented by the *first sketches*, first attempts at giving the project a material form. This can overlap with documentation or be postponed depending on how the artist worked. Some liked to immediately draw their project, some waited to make a "model", such as a clay version that requires more elaboration. This also raises the issue of the *materials and tools* employed for artwork. Unsurprisingly, artists engaged usually plenty of materials from watercolors or acrylic, oil colors and brushes to wood, metal, plastic, fiber, ink, cardboard, glass, etc. The repertoire of *work procedures* was based on repetition, multiplication, permutation, inversion, simplification, variation of the medium and many others similar techniques.
4. After sketches, there was normally a more or less extended period of *testing the forms and ideas* that originated from reflection and preliminary work. Missing adequate tools or materials was a common *difficulty* encountered at this stage. Also, forms of *material*

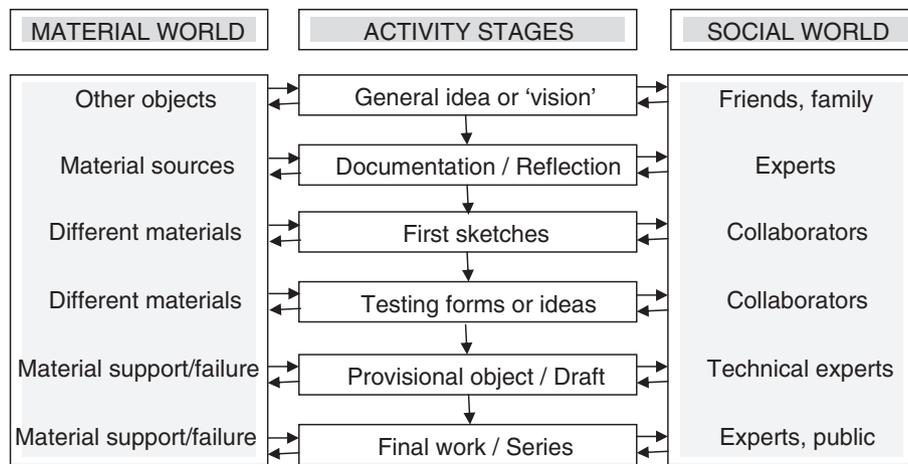


Fig. 2. Activity stages in art and their links to the physical and social environment.

undergoing came to the fore. Artists were very “tactile”, open to the “physical, sensorial, sensible properties of space” and required the dialog, the “confrontation” with the art object. Knowledge of physical properties was important for respondents who needed to know how materials “react”, how they can be “used” and what is a misuse of a certain material. The object “posed a question” to the artist, not the other way around, and participants enjoyed this aspect. The emotions stirred by artistic work were diverse (joy, pain, melancholia), but mainly positive, reflecting an immense “pleasure of making”.

5. These tests, of making and remaking, ended up in *provisional objects*, “drafts” and almost-finished products. This stage required working on the details of the work, perfecting its features, adjusting it to the context of presentation. A common *obstacle* had to do with the failure of the material support, the negative surprise of having the object melt, crack or even break completely. *Undergoing the final result* at this stage invited evaluative judgments by the artist whereas some argued that artistic work is never “done”, never complete. Art objects can “return” to their author to be reworked later.
6. It was also often the case for a first object to be followed by a *series*. In this situation, variations can be made and the vision finally completed. The end point was marked by strong *emotions*, satisfaction when the product had an “effect”, feeling rewarded and proud when the work was sold. This brings us again to consider the relation between the artist and the *social world*. Recognition from others, public and critics was sought after, although some artists rebelled and claimed that their works were not made to “seduce”. Feedback was nevertheless taken into account because it allowed respondents to put some well needed distance between themselves and their productions.

The six stages of creative activity in art outlined above came out of the qualitative analysis of interview material. As such, their description has the advantage of taking into account the real life experience of the participants as described in their own words. Between the six phases of work there were many feedback loops and a movement of ‘back and forth’ which can be better captured through longitudinal observation. In any case, artists mentioned this *cyclical and dynamic aspect of their work* constantly and described their activity as “action, reflection, action, non-action, plenty of action”, a dialog between themselves and the object. Dewey (1934) remains thus not only valid to this day, but worthy of renewed attention from creativity researchers.

7. Discussion

The findings show that artists spontaneously referred to key elements of the four Ps (person, process, press, and product; MacKinnon,

1978; Mooney, 1963; Plucker & Renzulli, 1999; Rhodes, 1961) and multivariate approach (cognitive, conative, emotional, and environmental components). Also, the qualitative coding allowed us to ‘reconstruct’ the main stages of the creative process. In the following discussion, the most important findings concerning artistic creativity will be summarized in light of their theoretical and practical implications.

7.1. Multivariate approach

In addition to the discourse of artists, the analyses of questionnaire data confirmed the importance of the cognitive component for artistic creativity. The capacities of the individual to generate, combine, assemble and accept new ideas are all essential for creative production. The literature is consensual on the involvement of these cognitive capacities in creativity and the artists seem to agree as well. For example, Carlson and Gorman (1992) considered that selective comparison – the capacity to compare information and also to compare it to previous knowledge – is very important for creativity. Bonnardel, Didierjean, and Marmèche (2003) underlined the importance of analogies and selective encoding in creative work. For artists in our sample, these cognitive abilities were also perceived as important.

The discourse of artists indicated that conative components are favorable for creativity. The analysis of questionnaire data confirmed the fact that openness to new experiences, esthetics, values and sources of inspiration are important. In agreement with this, Chamorro-Premuzic, Furnham, and Reimers (2007) explained that “personality differences underlying individuals’ art interests seem to be captured mostly by the Openness to Experience dimension” (p. 85).

The impact of feelings in art seemed to be a subject of controversy. During the interviews, artists mentioned often their feelings and how they could be helpful for their work. Nevertheless, in the data, the emotional component appeared as the least important. Certain artists considered that emotional components were important for their creativity and others held an opposite point of view. For example, some artists declared that satisfaction or anger could be the starting point for their creativity whereas guilt is rather blocking. From the interviews with artists, it seemed that both positive and negative feelings can facilitate creative work. However, when artists evoked the inhibitors of their creativity, emotional components were mainly cited. It can be concluded therefore that the importance of feelings and their favorable or unfavorable effects depend on emotional valence and specific content. This hypothesis can be completed by also considering the role of emotional intensity and emotional control.

Results from questionnaire data did not suggest that a special environment was necessary for artists. Life events and finances were not seen as essential. Nevertheless, the social environment was indicated as the most important of all environmental components. In artists’

narratives, the social environment corresponded to the “social world” universe. This universe was differentially cited according to respondent's gender, artistic domain, and years of art experience: women, multidisciplinary artists, and artists with more than 30 years of experience mentioned more about their social world than the other groups. In any case, the role of environmental conditions needs to be considered in conjunction with results from the qualitative coding of interviews, in order to clarify its function and contribution.

7.2. Personal characteristics

Women spoke more about their education than men. Interestingly, there are more men in the artistic world than women and the inequalities between genders in this field continue to prevail. The School of Fine Arts of Paris opened its doors to women in 1897. Thus, women mentioning education more often during the interviews may be an attempt to provide evidence of personal accomplishment and credentials in order to compensate for gender disparities. Furthermore, women also made references more to their social world than men. In addition, female artists often referred to their artwork as their offspring (“As if creations were children finally”) whereas male artists were more practical (“I work for my artwork”).

Analyses revealed differences in discourse according to artistic domain. Digital artists mentioned facilitating factors and creative cognition. Whether it is photography, video or net-art, technology was essential for creative work. Cluster analysis specified that the cognitive component was most important for digital artists whereas the emotional component was considered least important for their creativity. However, painters referred mainly to the creative action process and the material. In their case, the physical gesture and the tools used were essential but preparation was not seen as indispensable. The cluster analysis detailed that painters estimated emotional components as more important for their creativity than digital artists. The differences observed between digital artists and painters suggested two ways of creating, two different creative processes: a creative process based on cognitive components and a creative process based on action and gesture. Sculptors provided a similar viewpoint to that of digital artists: they talked about facilitating factors and the creative process cognition but, unlike digital artists, sculptors mentioned their education as well. Learning appropriate technologies seemed important to sculptors. Multidisciplinary artists frequently cited their social world. The flexibility of these artists revealed their openness. Multidisciplinary artists were in touch with other artists and persons from different fields such as mathematics, architecture, or physics. The differences between disciplines were already evoked by Baer (1999), who considered that the abilities necessary in a creative domain are not the same for other domains: each task is relatively specific and requires specific capabilities (Baer, 1998).

Finally, the level of experience in art could also explain differences in discourse. The less experimented artists (less than 10 years of activity) were more closely connected to their education. Their learning was still recent and they had less experience to draw on regarding factors facilitating or inhibiting creativity compared to older artists. The artists with 20–29 years of experience referred to inhibiting factors and to the world of art. Finally, experienced artists (with more than 30 years of activity) were recognized by their peers. During the interview, they spoke about facilitating factors for their creativity and about their social world. After 30 years of practice in art, experienced artists knew more people in their field and could thus more easily refer to them.

7.3. Creative process

From the artists' discourse, we uncovered also the stages of the creative process conceptualized as activity. This original approach led to consider processes in their psychological and behavioral interplay

and in relation to the material and social environment. The phases of *creative ideation–documentation/reflection–first sketches–testing forms–first object–the series* came out of a qualitative analysis of interview material. The contribution of this analysis can be considered, first, in the broader context of existing models of the creative process and, second, in relation to the findings and methods used in the research discussed here.

Many links can be made between the stages of the creative process coming out of this analysis and existing work in the creativity literature. For example, the first stage of *creative ideation* is close to the problem finding activities described by Getzels and Csikszentmihalyi (1976). Phases 2 (*documentation/reflection*), 3 (*first sketches*), and 4 (*testing forms*) can also be found in various models (John-Steiner, 1997; Mace & Ward, 2002). More specifically, if an analogy is made with the Geneplore model (Finke et al., 1992), phase 2 largely corresponds to the generative process associated with the construction and the search for ideas and stages 3 and 4 correspond to the exploratory process – testing the creative idea. Finally, the last stage was already described by Mace and Ward (2002) who explained that the artistic process is cyclical and iterative in nature, allowing the development of a series of products.

In relation to the existing literature, the main advantage of employing an action framework consists of understanding the situated nature of creativity, its connection to the larger context of the creator's life and his or her existence as a social actor. Activity theory considered both the ‘internal’ and ‘external’ facets of creation in their inter-relation. As such, the six stages above were discussed in terms of what the artist does but also what he or she undergoes, feels, comes against and wants to achieve. Few conceptualizations have been interested in all these components at or considered them as equally important. Mace and Ward (2002) aimed, for example, to capture the dynamics of the creative process through stages of artwork conception, idea development, making artwork and finishing artwork. Their description is similar to the cycle of doing and undergoing (in terms of an interplay between a developing vision, the latest productive activity and its' degree of success) documented in the present research.

The study discussed in this article followed primarily a multivariate model of creativity, aiming to capture the integrality and unity of creative work in its cognitive, conative, emotional and environmental components. The action analysis brought to this framework an organization of person and process elements along a time dimension, the succession of phases involved in the production of artwork. Inhibiting and facilitating factors previously uncovered were part and parcel of each of the six stages. Future efforts should be focused on “matching” each stage with its corresponding set of factors and work conditions.

7.4. Limitations

It is important in the end to acknowledge some limitations of this study. First, although the sample was sufficient for semantic analysis and qualitative coding (as saturation was easily reached), the number of participants ($n = 27$) may be too few for cluster analysis. Second, it is risky to abstract creative stages from ‘declarative’ accounts alone because they offer us primarily reconstructions of this work; however, there can also be methodological risks in relying exclusively on ‘objective’ and ‘depersonalizing’ types of analysis that do not take the experience of creators into account. Most models of the creative process were constructed based on interviews (Mace & Ward, 2002; Wallas, 1926) and, to a lesser extent, on observations (Botella et al., 2011b). A balance needs to be found in order to manage such inherent research trade-offs. The present article stands as an example of how different types of analyses complement each other. These analyses do not necessarily lead us to the same conclusions but contribute to a more comprehensive understanding of art, artists and artistic activity.

8. Conclusion

The present study, based on in-depth analysis of the discourse of experienced artists, offered a comprehensive exploration of creativity in art by triangulating theoretical models and types of analysis. Whereas some of these analyses are not uncommon to creativity studies (e.g. the multivariate approach), others suggest new theoretical perspectives (e.g., creativity as action). The methods used in this study could also be applied to other creative fields such as science, design or literacy.

The aims of this study were to identify the factors involved in artistic creativity, to examine the impact of personal characteristics on artists' discourse, and to describe the creative process of artistic activity. Although these aims were addressed here, other personal characteristics could be explored in further research to improve our understanding of artistic activity. In the present study, the discussion focused on creative factors and stages of the creative process. Findings have been related to the existing literature with an emphasis on how they contribute to it and open up new perspectives for the study and enhancement of creativity. For example, future research could extend these findings through direct observation of the factors involved in art and/or through observing the creative process.

Finally, in the present study a general conception of the creative process and the factors involved in artistic activity was proposed. Principal component analysis and cluster analysis allowed some individual differences between artists to be identified. Ideally, future research would focus on better understanding the creative process, as well as the factors involved; thereby informing the teaching of creativity and art. If some factors have unfavorable consequences for creative activity it may be possible, through training, to control their effects. For example, artists explained that affect could either facilitate or inhibit their creativity. However, affects seem to be more involved in painting than in digital arts. Thus, if future research reveals similar findings based on artists' descriptions, then this insight could guide the development of a teaching method to help painters better understand feelings and thus facilitate their creativity; similarly another method could help digital artists avoid feelings that may block creativity. Moreover, if the creative process is further specified, approaches to effectively teaching creativity in art could be proposed for each stage of artistic creativity. These educational implications require further development and could use the present findings as a starting point.

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