

Enhance creativity and creative self-efficacy. An action research with Italian children

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Abstract

Creativity is a human resource that allows individuals to solve problems in a new way and propose changes. It is related to creative self-efficacy that regards individual belief to be creative. The present study explored the effects of a training to enhance creativity and creative self-efficacy in 34 Italian children, aged between 8 and 10 years and divided in two groups: Group1 (training) and Group2 (no training). Test of Divergent Thinking and the Creative Self-efficacy Scale were modified for Italian children. After training, Group1 increased inflexibility, elaboration and title production; and Group2 increased in titles production; all children showed higher levels of self-efficacy than before training. After training, positive relationships between creative self-efficacy, elaboration and titles production emerged for Group1.

Keywords: Creativity, self-efficacy, training, children.

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1. Introduction

Creativity is a human resource that allows individuals to solve problems in a new way and propose changes that could be useful for themselves and for society. In this sense, enhancing creativity is concerned with the improvement of an individual's ability to develop innovative, unusual and unconventional ideas functional to face individual and social problems in original ways (see Dacey & Lennon, 2000; Guilford, 1950, 1987; Run co, 2007; Sternberg, 2006; Torrance, 1974).

From the multi factorial perspective, creativity is considered a multi-component topic that distinguished several factors. More specifically, according to Guilford's perspective (1950, 1987), it is possible to identify five factors in creativity: (1) fluency, referred to the ability to produce a great number of ideas; (2) flexibility, concerning the ability to think of ideas linked to different categories and to pass from one category to another; (3) originality, which is the competence to find uncommon and rare solutions and ideas; (4) elaboration, linked to the competence to add details and enrich ideas; and (5) evaluation, defined as the sensibility to solve problems by means of the analysis and selection of good ideas. In light of this model, Williams (1994) elaborated a multi-composed test to analyse divergent thinking, creative personality and the evaluation that teachers and parents gave on the creativity of children. Unlike Guilford, Williams did not consider the sensibility to solve problems as important and added a new factor that was the titles production, referred to as the original and unusual use of language to describe pictures.

To be creative is strictly related to perceiving oneself as a creative individual, which is creative self-efficacy (Choi, 2004; Jaussi & Randel, 2014; Tierney & Farmer, 2011). Creative self-efficacy is defined as 'the belief one has the ability to produce creative outcomes' (Tierney & Farmer, 2002, p. 1138) and it is considered as a specific type of self-efficacy (Woodruff & Cashman, 1993). In general, self-efficacy is referred to as a person's believe in their ability to organise and execute a required course of actions to achieve desired goals (Bandura, 1997; Brown, Jones & Leigh, 2005). It was demonstrated that self-efficacy has a relevant role in driving the actions and behaviour of individuals (Bandura, 2007) and, in this sense, belief in self-abilities influences people's choices and orientates their future planning (Pajares, 1996; Sherer et al., 1982).

In relation to creative self-efficacy, scholars found that it predicts creative behaviour and mediates the effects of many factors on creative performance (Beghetto, Kaufman & Baxter, 2011; Choi, 2004; Jaiswal & Dhar, 2016; Jaussi & Randel, 2014; Tierney & Farmer, 2004). In a study based on longitudinal and multisource data, Choi (2004) demonstrated that creative self-efficacy was one of psychological predictors of creative performance. As well as, in a longitudinal examination of the development of creative self-efficacy, Tierney and Farmer (2011) pointed out that the increase in creative self-efficacy corresponds with an increase in creative performance. Additionally, Jaussi and Randel (2014) found positive relationships between creative self-efficacy and creativity.

According to Beghetto (2006), creative self-efficacy could be analysed by means of three relevant areas regarding an individual's beliefs about their ability to generate novel and useful ideas and whether they viewed themselves as having a good imagination.

1.1. *Trainings to enhance creativity and creative self-efficacy*

Enhancing creativity is considered as a relevant purpose in education programmes; at the end of the last century, analysing educational police documents of 16 developed countries, O'Donnell and Micklethwaite (1999) found that creativity education was recommended from early education to higher education. More recently, Shaheen (2010) noted that policy documents provided by European, American, Australian and East Asian countries focused their attention on creativity. Actually, for example, the Council of the European Union (2018) referred to key competences for lifelong learning and considered creativity as an essential skill in changing society.

Some empirical researches proposed and evaluated the effect of specific trainings functional to enhance factors of creativity in children (see Antonietti & Colombo, 2012; De Caroli, Falanga, Licciardello & Sagone, 2017; Lupi & Antonietti, 2000). Experimental research carried out on children aged between 6 and 10 years by Lupi and Antonietti (2000) and Antonietti and Colombo (2012) suggested that training based on the development of mental imagery increased creativity in children. Recently, De Caroli et al. (2017) carried out a training made up of three activities in which children aged between 7 and 8 years (a) imagined to see objects looking in a kaleidoscope and wrote a story with imagined objects; (b) proposed ways to enhance a simple toy; and (c) found similarities between couples of objects; this study was useful in enhancing creativity in childhood and flexibility, originality, elaboration and title production significantly increased in post-training. Furthermore, more recently, Lucchiari, Sala and Venutelli (2019) showed positive effects on the enhancement of creativity in primary schoolchildren by means of a training based on a series of group games and exercises, interactive activities oriented to induce children to produce new ideas, the ability to imagine multiple ways to use an object and the ability to think potential consequences to events, dialogical sessions, maieutic conversations and ludic activities.

Considering the link between creativity and creative self-efficacy, Byrge and Tang (2015) pointed out an embodied creativity training programme for trainees based on five main points: an introduction, creativity fitness exercising, a 20-hour workshop, a national entrepreneurship festival and a theoretical reflection. The authors demonstrate that this training had positive effects on both creative production and creative self-efficacy.

In general, Bandura proposed three principles to enhance self-efficacy: to promote conditions in which individual experiences successful episodes that aim to build his/her efficacy belief; to valorise vicarious experience during which individuals observe others using strategies to reach objectives successfully; and to adopt verbal persuasion where the individual is convinced verbally that he possesses the capabilities needed to obtain success. In light of Bandura's principles, Mathisen and Bronnik (2009) proposed a training based on lectures, discussions and demonstrations about central theories and research on creativity, training in creative processes and to plan action functional to facilitate creative processes in other groups. In a study with young adults, the authors found that this training significantly increased self-efficacy levels in all participants.

2. Purpose of the study

The main purpose of the current study was to observe change after training in Group1 (training) in relation to the levels of the five factors of creativity and creative self-efficacy. In detail we hypothesised that:

H₁ children attending the training will improve levels of five creativity factors;

H₂ children attending the training will increase in creative self-efficacy;

H₃ creative self-efficacy positively affected the five factors of creativity in both groups of children.

No differences were expected for Group2 (no training).

3. Methodology

3.1. Sample

Thirty-four Italian children aged between 8 and 10 years ($M = 8.91$, $SD = 0.51$) were involved in this study. The sample was divided in two groups in relation to training:

- Gr1 comprised 17 (10 females) children ($M_{age} = 9.06$, $SD = 0.24$) attending the training to enhance creativity and creative self-efficacy;
- Gr2 comprised 17 (10 females) children ($M_{age} = 8.76$, $SD = 0.66$) without creativity training. Children of this group participated in the regular school curriculum and did not take part in training. They were age-matched children of Gr2.

Children of Gr1 participated in small groups during school time. Parental consent was requested and obtained for all children participating in the research prior to beginning data collection.

Researchers followed the ethical code for Italian psychologists (L. 18.02.1989, n. 56), the ethical code for psychological research (reviewed in March 27, 2015) by the Italian Psychologists Association and DL for data privacy (DLGS 196/2003).

3.2. Measures

We used the Italian version of the Test of Divergent Thinking (Williams, 1994) to assess the levels of creativity factors both before and after training. In detail, we used protocol A before training and protocol B after training. Protocol A and protocol B were administered in the same periods only to the children of Gr1. These protocols were perfectly comparable and constituted 12 frames, each containing incomplete graphic stimuli (different for A and B); the researcher asked the children to draw original and creative pictures into each frame and to name them with an unusual title. According to the aforementioned William's model, creativity consists of the following factors: fluency, flexibility, originality, elaboration and production of titles. The fluency score was measured summing the meaningful pictures created by the participants (range: 1–12 points). The flexibility score was the number of changes of ideas from one category to another (range: 1–11 points). The originality score was obtained by the sum of the total number of pictures drawn inside or outside each incomplete stimulus placed in the frames (range: 1–36 points); more specifically, the researcher assigned 1 point to each picture drawn outside the stimulus, 2 points to each picture drawn inside the stimulus and 3 points to each picture drawn both inside and outside the incomplete stimulus. The elaboration score was obtained by the sum of the number of asymmetric pictures drawn by the children (range: 1–36 points): 0 points were assigned to the symmetrical pictures, 1 point to the asymmetric pictures drawn outside the incomplete stimuli, 2 points to the asymmetric pictures inside the incomplete stimuli and 3 points to the asymmetric pictures drawn both inside and outside the stimuli. The score of the production of titles was calculated by summing the points assigned to each title produced by the children: 1 point was assigned for simple and descriptive titles, 2 points were assigned to titles with qualifying adjectives and 3 points for imaginative titles indicating something beyond the picture drawn by participants (range: 1–36 points).

The Self-efficacy Scale (SES) (Beghetto, 2006) was used to measure the creative self-efficacy. SES consisted of three items intended to measure children's beliefs about their ability to generate novel and useful ideas and whether they viewed themselves as having a good imagination: (1) 'I am good at coming up with new ideas,' (2) 'I have a lot of good ideas' and (3) 'I have a good imagination.' These items were evaluable on a 5-point Likert scale from 1 (corresponding to absolutely false) to 5 (corresponding to absolutely true). In the children's version presented in this study, the numbers of the Likert scale would come up beside these miles (1=two sad smiles; 2=one sad smile; 3=one neutral smile; 4=one happy smile; 5=two happy smiles).

3.3. Training

In the present study, three practical activities were proposed (see De Caroli et al., 2017):

1. to enhance originality (as the ability to draw inside and outside stimuli) and production of title, we asked the children to imagine objects looking into a kaleidoscope and to write a story with the imagined objects;
2. to improve elaboration (linked to the ability to draw asymmetrical pictures), we proposed to find ways to enhance a simple toy and to make it funny (activity b) (see Torrance, 1974,1981);
3. to increase flexibility, defined as the ability to shift from a mental category to another, we requested to the children to find similarities between couples of different objects (see Gordon, 1961).

No activities were used to enhance the fluency because it was already very high before the training.

All activities were accurately explained by trainers to facilitate children to experience success in activities or in a part of them. Moreover, trainers positively evaluated answers provided by children to convince them that they possessed the abilities needed to realise creative performances.

Each activity was realised once a week and it lasted for 1hour. All of the activities ended after 1month. The training was realised during school time in small groups.

3.4. Data analysis

The examination of the statistical significance of the results was carried out using the Statistical Package for the Social Sciences 20.0 software, by means of the paired sample *t*-test and linear regressions. The type of group (Gr1 vs. Gr2) was used as independent variable.

4. Results

4.1. Creativity production

Descriptive analyses before training showed that the children in our sample achieved higher levels in fluency, flexibility and elaboration than normative means proposed by Williams (1994, see Table 1); levels on the average in originality; and lower levels than normative means in title production (Figure 1), without statistical significant differences between Gr1 and Gr2.

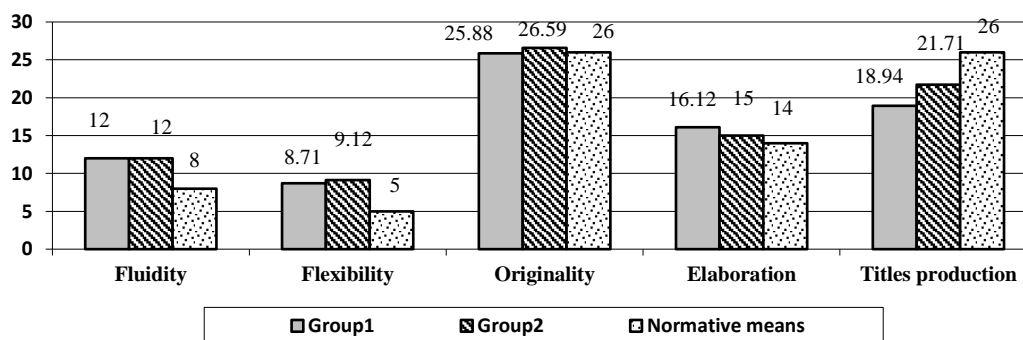


Figure 1. Factors of creativity – total sample

Table 1. Normative means of children attending classes IV and V of primary school.

	Fluency	Flexibility	Originality	Elaboration	Title
Gifted in creativity	10	7	27	25	32
Over the average	9	6	27	22	27
On the average	8	5	26	14	26
Under the average	6	4	16	9	24

Adapted from Williams (1994).

After training, Gr1 significantly improved in flexibility ($t = -2.141, p = 0.05$), elaboration ($t = -2.729, p = 0.01$) and title production ($t = -2.246, p = 0.04$) (Table 2).

Table 2. Levels of creativity before and after training – Gr1.

	Before training Mean(SD)	After training Mean(SD)	<i>t</i>	<i>p</i>
Fluency	12 (0)	11.88 (0.48)	1.000	0.33
Flexibility	8.71 (1.21)	9.41 (1.06)	-2.141	0.05
Originality	25.88 (4.79)	26.53 (4.23)	-0.494	0.63
Elaboration	16.12 (4.28)	19.29 (4.52)	-2.729	0.01
Title production	18.98 (4.67)	22.53 (5.27)	-2.246	0.04

Moreover, Gr2 significantly increased only in titles production ($t = -3.067, p = 0.002$) (Table 3).

Table 3. Levels of creativity before and after training – Gr2.

	Before training Mean(SD)	After training Mean(SD)	<i>t</i>	<i>p</i>
Fluency	12 (0)	11.94 (0.24)	1	0.33
Flexibility	9.12 (1.22)	8 (2.03)	1.864	0.08
Originality	26.59 (1.94)	28.29 (4.30)	-1.448	0.17
Elaboration	15 (2.94)	13.41 (1.84)	1.554	0.14
Title production	21.71 (3.40)	26 (3.08)	-3.067	0.002

4.2. Creative self-efficacy

Before the training and without statistical differences between Gr1 and Gr2, the children displayed levels over the average of creative self-efficacy ($M = 4.00, SD = 0.64$) (see Beghetto, 2006). After training, both Gr1 ($M = 4.49, SD = 0.63$) ($t = -2.963, p = 0.009$) and Gr2 ($M = 4.67, SD = 0.33$) ($t = -2.963, p = 0.009$) showed higher levels of self-efficacy than those obtained before training.

4.3. Effects of creative self-efficacy on creativity factors

In order to verify the third hypothesis (H_3) about the influence of creative self-efficacy on creativity, it was chosen to carry out linear regressions (separately for type of group) using creative self-efficacy as independent variable and creativity factors as dependent variables.

Results confirmed H_3 only for Gr1: elaboration ($\beta = 0.58; t = 2.786, p = 0.01$) and title production ($\beta = 0.54; t = 2.481, p = 0.02$) were positively affected by creative self-efficacy only after training.

5. Discussion and conclusion

The results partially confirmed H_1 : positive effects of creativity training for Gr1 in children's ability to think of ideas linked to different categories and to pass from one category to another and the ability to add details and enrich ideas were noted. Moreover, the results showed that both children of Gr1 and Gr2 scored higher than before training in title production. It means that to attend a creative training or regular school curriculum pointed out similar results in increasing the ability to use original and rich language to describe pictures. School seemed to achieve the objective to develop and enrich children's language; however, it is less incisive in improvement of flexibility and elaboration.

In reference to H_2 , the results displayed that both Gr1 and Gr2 improved in creative self-efficacy. In this sense, it was possible to confirm that the training improved creativity also in children aged between 8 and 10 years, but was less functional in enhancing creative self-efficacy.

In reference to relationships between creative self-efficacy and the five creative factors, contrary to expected results (H₃), in the present study, creative self-efficacy did not affect creativity factors before training. However, after the training period, only students who attended the training were noted to perceive themselves as good at coming up with new and a lot of good ideas and thought they have a good imagination positively affects performances in elaboration and title production. In this sense, training modifies the relationship between beliefs in children's creative-self efficacy and their effective creativity. Although the size of sample did not permit us to generalise our results, the outcomes that emerged on the relationships between creative self-efficacy and the five creative factors could be considered to contribute to the increase in our knowledge on this issue of creative self-efficacy.

The present study provides evidences in relation to the effectiveness of proposed training to enhance creativity. It could be desirable to promote this training in schools in order to develop the education provided and guarantee the development of abilities that allow individuals to develop innovative, unusual and unconventional ideas that are functional to face individual and social problems in original ways. In this manner, school will get ready future citizens to solve problems and propose changes that could be useful for themselves and for the society.

Future research could deepen the relationships between creative self-efficacy and creativity factors and the effectiveness of this training in adolescents and young adults.

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