HOW CAN WE ENHANCE CREATIVITY IN CHILDHOOD? AN ACTION RESEARCH WITH ITALIAN CHILDREN

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ABSTRACT

Creativity was defined as "the centerpiece of an education that prepares a generation of change agents for doing good" (Sheridan-Rabideau, 2010). In the theoretical framework of the action research model (see Lewin, 1951) this study was aimed to propose a training to enhance creativity in children. According to the William's model (1966, 1994), creativity is made by the folloing factors: fluency, flexibility, originality,elaboration and the ability to produce creative titles . **Purpose**: to explore the effects of a specific training on improvement of creativity factors. Training consisted of three steps (1 hour every one) in which the children, respectively, 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 to make it funny (see Torrance, 1989); c) found similarities between couples of objects. **Sample**: 36 Italian children (16 boys and 20 girls) aged between 7 and 8 years old, attending second classes of a primary school in Misterbianco (Italy). Participants were divided between experimental group (attending training) and control group (no training). **Measures:** The Italian version of Test of Divergent Thinking (TCT: Williams, 1994). We used protocol A to analyze levels of creativity before the training and protocol B (perfectly comparable with protocol A) to evaluate creativity after training. **Results:** Children reached levels of creativity similar to those obtained by children of the same age in our context (De Caroli, 2009). After training, children of the experimental group improved in flexibility (t= -2,872, p=.01), originality (t= -3,831, p=.001), elaboration (t= -6,096, p<.001), and in titles production(t= -3,573, p=.002). No significant changes emerged in the Fluidity. Future research could deepen the effects of this training in children of different ages.

Keywords: enhance creativity, primary school, Test of Divergent Thinking.

INTRODUCTION

Creativity is a multifaceted phenomenon that could be considered a source for society; it is the ability to develop new, original and unconventional ideas in order to design something new or even to solve existing problems in new ways (see Guilford, 1950, 1987; Torrance, 1974; Dacey & Lennon, 2000; Sternberg, 2006; Runco, 2007). Since the mid-50s of the last century, it was clear that creativity played a key role in development of society and that enhancing creativity was the main way to favour the progress (Cropley & Dehn, 1996). In this sense, Sheridan-Robidou (2010, p.54) defined creativity "as the centerpiece of an education that prepares a generation of change agents for doing good".

According to the Guilford (1950, 1987), Torrance (1959, 1974, 1981) and Williams (1966, 1994), creativity is a multi-component process constituted by a set of factors. In detail, Guilford picked out five factors that constituted creativity: fluency, referred to the capability to produce a lot of ideas; flexibility, that is the competence to change categories and to pass from a category to another; originality, linked to the ability to find unusual solutions and to provide unique ideas; elaboration, that is the aptitude to enrich ideas with several details, and evaluation, defined as the sensibility to solve problems by means of the analysis and selection of good ideas. On the basis of Guilford's model, Torrance (1974) and Williams (1979) proposed two different tests functional to analyze creativity factors. In detail, Torrance proposed the TTCT (Test of Creative Thinking) to measure fluidity, flexibility, originality, and elaboration by means of two sets of verbal and figural activities. Williams elaborated a multi-composed test to analyze divergent thinking, creative personality, and the evaluation that teachers and parents gave on the creativity of children. Unlike Guilford, Williams didn't consider important the sensibility to solve problems and added a new factor that was the titles production, referred to an original and unusual use of language to describe pictures.

These tests were widely used to measure the factors of creativity in the developmental age in order to compare creativity in typical development children and in disabled children (De Caroli & Sagone, 2010a, 2010b) and to deepen the relationship between creativity and other important psychological processes like stereotypical flexibility (De Caroli and Sagone, 2009a), personality traits (De Caroli & Sagone, 2009b), emotional intelligence (Salavera, Usán, Chaverri, Gracia, Aure & Delpueyo, 2017), emotion comprehension (Sagone & De Caroli, 2014) and so on.

In reference to the enhancement of creativity, some researchers, like Ahmadi et al. (2013), paid attention on barriers that reduce the possibility to increase creativity in children but few empirical researches proposed and evaluated the effect of specific trainings functional to enhance factors of creativity in children (see Udwin, 1983; Lupi & Antonietti, 2000; Moore & Russ, 2008).

On the basis of these evidences and into the frame work of action-research (Lewin, 1951), this study was aimed to propose a training functional to enhance the five factors of creativity in children.

THE PRESENT STUDY

The main purpose of this study was to explore the effects of a specific training on the improvement of creativity factors. In detail, we assumed that children who participated in training activities (training group) improved levels of fluidity, flexibility, originality, elaboration, and titles production compared to non-participants (control group).

METHOD

1 Participants

Thirty eight children (16 boys and 20 girls) aged between 7 and 8 years old attending second classes of a primary school[1] in Sicily were involved. Participants were divided into training group (attending training) (n.18) and control group (no training) (n.18) matched for sex, age and levels of creativity.

2 Materials and procedures

2.1The test of creative thinking

We used the Italian version of *Test of Divergent Thinking* (Williams, 1994) to assess 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 proposed to children in the same periods but control group didn't attend specific training. These protocols are perfectly comparable and are both constituted by 12 frames 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 it 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 a another (range 1-11 points). The originality score was calculated summing 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 one 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): zero points were assigned to the symmetrical pictures, one 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 children: one point was assigned for simple and descriptive titles, 2 points were assigned to titles with qualifying adjectives, 3 points for imaginative titles indicating something beyond the picture drawn by participants (range 1-36 points). Examples of frames with graphic stimuli and pictures drown by the children were reported in fig.1a and 1b.

Fig.1a Example of frames with graphic stimuli (Protocol B)

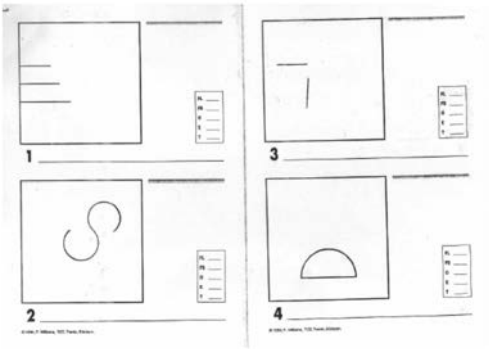
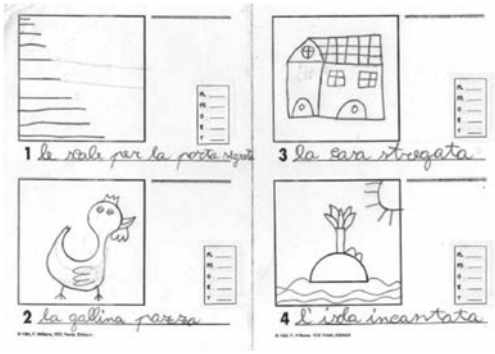


Fig.1b Example of pictures drown by a child (Protocol B)



2.2 Training

The training was realized during school time in small group setting. It consisted of three practical activities: in order to enhance originality (as the capability to draw inside and outside stimuli) and production of title we asked the children to imagine objects looking in a Kaleidoscope and to write a story with imagined objects (**activity a**); in order to improve elaboration (linked to the capability to draw asymmetrical pictures) we proposed to find ways to enhance a simple toy and to make it funny (**activity b**) (see Torrance, 1989); finally, in order to increase flexibility, defined as the capability to shift from a mental category to another one , we proposed to the children to find similarities between couples of different objects (**activity c**) (see Gordon, 1961). Each activity was realized one time a week and it lasted one hour. All of the activities ended after one month.

Activity a. Kaleidoscope is a cylinder toy with mirrors containing a number of loose, colored objects like beads, used as beneficial method to provide optimal pain and anxiety control during medical test in children (Tüfekci, Celebio & Küçüko S, 2009; Canbulat Inal & Sönmezer, 2014). Looking into the tube children saw undefined colored shapes that changed aspect and position whenever they turned the cell and they were asked to use these shapes to imagine objects. This way, the children could break the boundaries of visual stimuli and improve their capability to move their imagination inside and outside shapes and stimuli, that is the capability evaluated in originality. Furthermore, the names of imagined object were written on the blackboard, so that all children were able to remember objects that each group proposed. Moreover, children were asked to write a story with the names of objects written on the blackboard; this way, the children learned to use and combine words in creative production, improving their capability to produce original and unusual titles.

Activity b. For this activity we took inspiration from the fourth activity proposed by Torrance, in the verbal set of his Test of creative thinking. To measure elaboration, the Author (1981) asked the children to indicate ways to enhance a toy~~s~~, a little elephant drawn in a sheet of paper. Similarly, in order to improve elaboration, we asked the children to propose ways to enhance a little stuffed animal; in this case, however, we used a real toy and not only a drawing; this way, the children could pick it up and play with it. By means of this activity the children learn to embellish, introduce details and enrich elements; that is the ability evaluated in elaboration.

Activity c. According to Gordon, creativity could be enhanced by using analogies and similarities (1961). In this perspective, using the synectics, a problem solving technique based on the research of similarities among different elements, subjects improved their capability to analyze a problem by applying interpretative categories typical of other situations. In this activity we asked the children to find similarities between couples of different objects or living being (for example "a cat and a dog", "a kite and a little sparrow", "a pig and a potato". During the activity, the children were stimulated by the researcher to find similarities by observing the couple of elements under different perspectives and by using an unusual point of view. For example, the children used the categories objects vs living being (for example, the cat ate and also the dog ate; the cat is a living being such as dog, etcetera); features of structure/body (for example, the cat has the tail such as the dog, or the kite has a sort of tail like the little sparrow, and so on); the shape of the details (for example, the beak of the little sparrow looks like a little triangle such as the corners of the kite have the shape of triangles); the letters that form words (for example, the first letter of pig is "p" such as the first letter of potato); the category of stationary vs. moving elements (for example, the cat walked on all fours such as the dog; the kite flew in the sky such as the little sparrow, and so on).

No activities were proposed to enhance the fluidity because it was already very high before the training.

3.3 *Data analysis*

The examination of the statistical significance of results was carried out using the SPSS 17.0 software (Statistical Package for Social Science), by means of t for paired sample. The participation at creative training was used as independent variable.

RESULTS

The preliminary analysis underlined that there were no differences, in the before training phase, between scores obtained by training group and control group.

Moreover, before the training the levels of creativity obtained by our sample were similar to those found in previous researches carried out in our context (see De Caroli & Sagone, 2009); like in De Caroli and Sagone, the children of our sample achieved higher levels on fluidity and flexibility then normative means proposed by Williams (1994, see table one) and obtained lower levels than normative means in originality, elaboration and title production (see Figure 2).

Figure 2. Mean scores on factors of creativity

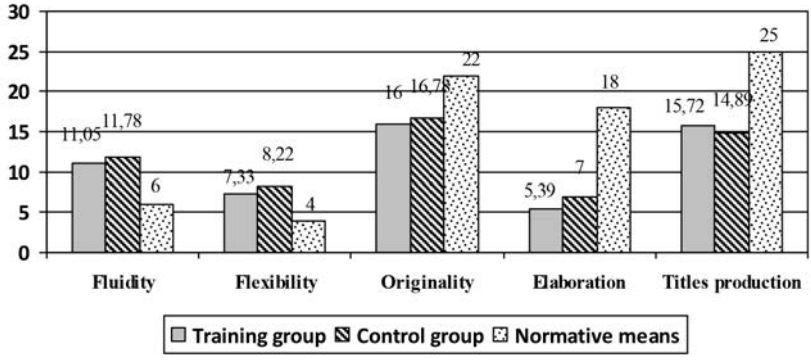


Table 1. Normative means for children attending I, II and III classes of primary school (see Williams, 1994)

Levels of creativity	*Normative means*				
	Fluidity	Flexibility	Originality	Elaboration	Title production
Gifted in creativity	9	6	27	24	30
Over the average	7	5	26	21	26
On the average	6	4	22	18	25
Under the average	5	3	15	13	22

In reference to the role of training, we noted that only in the training group there was a significant increase on all factors of creativity with the exception of fluidity (Table 2). Specifically, after training, the children reached higher levels on flexibility (t= -2,872, p=.01), originality (t= -3,831, p=.001), elaboration (t= -6,096, p<.001), and in titles production(t= -3,573, p=.002).

No differences emerged in control group.

Table 2. Mean score of factor creativity – comparison between before and after training (n.18)

Creativity factors	Group Training				*t*	*p*
	Before training		After Training			
	M	*sd*	M	*sd*		
Fluidity	11.05	*1,98*	12	*,00*	-2,019	*n.s.*
Flexibility	7,33	*2,47*	8,94	*1,25*	-2,872	.01
Originality	16	*5,79*	20,67	*3,66*	-3,831	.001
Elaboration	5,39	*2,28*	10,11	*3,78*	-6,096	<.001
Title production	15,72	*2,64*	20,05	*3,89*	-3,573	.002

DISCUSSION AND CONCLUSION

Preliminary analysis carried out before training confirmed that children in our context, similarly to previous research (De Caroli and Sagone, 2009), could be considered gifted in the ability to produce a great number of ideas and to propose ideas belonging to different categories. However, they were under the average in the ability to produce unusual ideas, to enrich pictures with many details and to write imaginative titles.

Results displayed that the proposed training was functional to improve creativity factors in our sample. After training, the children scored higher than before on flexibility, originality, elaboration and title production. It means that there was an empowerment in their capability to conceive ideas from different category and, specifically to pass from one category to a different one, to draw pictures inside or outside each incomplete stimulus placed in the frames, producing original and unusual pictures, to enrich their pictures with more details, and to invent original and imaginative titles for their pictures. No differences emerged on fluidity, maybe because the children obtained highest level in this factor already before training and no differences were noted in the control group on all five factors.

Although after the training the children increased in these factors, we underlined that only for originality our sample reached scores considered on the average respect to normative means. In

this sense, the children improved in elaboration and title production but they remained under the average.

These findings could be used as a starting point to realize stable educational programs focused on the development of creativity in the school-context.

Future researches could test the efficacy of this training also in different age group of children.

REFERENCES

Ahmadi, N. T., Mustaffa, S. & Ahmadi, A. (2014). The Barriers of Enhancing Creativity Developed by Parents in Developing Countries. *Procedia - Social and Behavioral Sciences,* 114(21), 257-261.

Canbulat, N., Inal, S. & Sönmezer, H. (2014). Efficacy of Distraction Methods on Procedural Pain and Anxiety by Applying Distraction Cards and Kaleidoscope in Children. *Asian Nursing Research,* 8(1), 23-28.

Cropley A. J., Dehn D. (eds.).(1996). *Fostering the growth of high ability: European perspectives*. Portsmouth: Greenwood: Publishing Group.

Dacey, J. & Lennon, K. (2000). *Understanding creativity: the interplay of biological, psychological and social factors*. Buffalo, NY: Creative Education Foundation.

De Caroli M. E. & Sagone E. (2014). Divergent Thinking In Children With Down Syndrome. *Procedia - Social and Behavioral Sciences*, 141(25), 875-880.

De Caroli M. E. (2009). *Pensare essere, fare… creativamente. Riflessioni teoriche ed indagini empiriche in età evolutiva.* Milano: Franco Angeli.

De Caroli, M. E. & Sagone, E. (2009a). Flessibilmente … stereotipi di genere creatività e contesti scolastici a confronto. In M.E. De Caroli (Ed.), *Pensare essere, fare… creativamente. Riflessioni teoriche ed indagini empiriche in età evolutiva,*(pp. 143-173). Milano: Franco Angeli.

De Caroli, M. E. & Sagone, E. (2009b). Persona(lità) e pensiero divergente in età adolescenziale. In M.E. De Caroli (Ed.), *Pensare essere, fare… creativamente. Riflessioni teoriche ed indagini empiriche in età evolutiva,*(pp. 176-185). Milano: Franco Angeli.

De Caroli, M. E. & Sagone, E. (2010a). A Study on Creative Performance in Italian Children with Learning Disability. *INFAD-Revista de Psicologia,* 3(1), 855-862.

De Caroli, M. E. & Sagone, E. (2010b). Mental synthesis and creative thinking in learning disabled children. In G. Perez-Bustamante, K. Phusavat & F. Ferreira (Eds.), *Proceedings presented to the IASK International Conference on Teaching and Learning* (pp. 272-279). Seville, Spain: IASK–International Association for Scientific Knowledge.

Gordon, W. J. (1961). *Synetics: the development of creative capacity.* New York: Harper.

Guilford, J. P. (1950). Creativity. *American Psychologist,* 5(9), 444-454.

Guilford, J. P. (1987). Creativity Research: Past, Present and future. In S.G. Isaksen (Ed.), *Frontiers of creativity research: beyond the basics* (pp.33-65). Buffalo, NY: Bearly Limited.

Lewin, K. (1951). *Field theory in Social Science.* NY: Harper & Row. Trad. it., *Teoria e sperimentazione in psicologia sociale*. Bologna: Il Mulino (1972).

Lupi, G., & Antonietti, A. (2000). Sviluppo della creatività infantile attraverso la sintesi di immagini mentali [Enhancing children creatività through mental image synthesis]. *Psicologia dell'Educazione e della Formazione*, 2, 353-370.

Moore, M. & Russ, S. W. (2008). Follow-up of a Pretend Play Intervention: Effects on Play, Creativity, and Emotional Processes in Children. *Creativity Research journal*, 20(4), 427-436.

Runco, M. A. (2007). *Creativity. Theories and Themes: Research, Development and Practice*. Amsterdam: Elsevier.

Sagone, E. & De Caroli, M. E. (2014). Emotion comprehension and divergent thinking: what's their relationship in developmental age? *Procedia - Social and Behavioral Sciences,* 116(21), 585-589.

Salavera, C., Usán, P., Chaverri, I., Gracia, N., Aure, P. & Delpueyo, M. (2017) Emotional intelligence and creativity in first- and second-year primary school children. *Procedia - Social and Behavioral Sciences, 237* (21), 1179-1183.

Sheridan-Rabideau, M. (2010).Creativity repositioned. *Arts Education Policy Review*, 111(2), 54–58.

Sternberg, R. J. (2006). The nature of creativity. *Creativity Research Journal*, 18(1), 87-98.

Torrance E. P. (1959). Current research on the nature of creative talent. *Journal of Research and development in Education*, 15, 29-37.

Torrance, E. P. (1974). *Norms technical manual: Torrance Tests of Creative Thinking*. Lexington, Mass: Ginn and Co.

Torrance, E. P. (1981).Empirical validation of criterion-referenced indicators of creative ability through a longitudinal study. *Creative Child and Adult Quarterly*, 6, 136-140.

Tüfekci, F. G., Celebio, A. & Küçüko, S. (2009). Turkish children loved distraction: Using kaleidoscope to reduce perceived pain during venipuncture. *Journal of Clinical Nursing*, 18(15), 2180-2186.

Udwin ,O. (1983). Imaginative play training as an intervention method with institutionalized preschool children. *British Journal of Educational Psychology*, 53(1), 32-39.

Williams, F. E. (1966). Creativity in engineering education. *Personnel Administration*, 29 (5), 22-27.

Williams, F. E. (1994). *Test della creatività e del pensiero divergente*. Trento: Centro Studi Erickson.

[1] Research was carried out in collaboration with children, teachers, and headmaster of L.Sciascia primary school in Misterbianco (Sicily).