

## THE DEVELOPMENT OF CREATIVE THINKING IN PRESCHOOL AND SCHOOL AGE CHILDREN

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**RESUMEN.** La creatividad parece estar relacionada con las competencias emocionales (Sánchez -Ruiz, Hernandez-Torrano, Pérez-González, Batey, y Petrides 2011; Hoffman y Russ, 2012) y es esencial para mejorar el bienestar psicológico y facilitar la adaptación de los niños al contexto. Este estudio tiene como objetivo investigar el desarrollo del pensamiento creativo en los niños en edad preescolar y escolar en relación con la edad, el género, la inteligencia no-verbal y la comprensión de las emociones. Fue evaluado un grupo de 361 niños de los 5 á los 11 años sobre su capacidad creativa, su inteligencia fluida y su comprensión de las emociones: los resultados mostraron que la competencia creativa no aumenta linealmente con la edad aunque los niños mayores realicen dibujos más originales y elaborados. Los hombres también resultan más creativos que las mujeres. Todos los niños son capaces de distinguir su producción entre creativa y no-creativa . De acuerdo con la literatura, la inteligencia no-verbal y la competencia emocional aumentan linealmente con la edad y no hay diferencias de género. Entre los tres aspectos investigados surgieron correlaciones interesantes.

**ABSTRACT.** Creativity proved to be related to emotional competences (Sanchez-Ruiz, Hernandez-Torrano, Pérez-González, Batey, and Petrides, 2011; Hoffman and Russ, 2012) and it is essential to enhance psychological well-being and to facilitate children's adaptation to the context. This study aims at investigating the development of creative thinking in preschool and school age children in relation with age, gender, non-verbal intelligence and emotion comprehension. A group of 361 children aged between 5 and 11 were assessed on: creative ability, fluid intelligence and emotion comprehension. Results showed that creative competence does not increase linearly with age, even if older children realize more original and more elaborate drawings than younger ones. Males are more creative than females. All the children are able to discriminate their production between creative and non-creative. In line with the literature, non-verbal intelligence and emotional competence increase linearly with age and there are no gender differences. Among the three investigated aspects interesting correlations emerged.

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## Introduction

Creativity is essential to enhance psychological well-being and to facilitate children's adaptation to the context. It is a complex phenomenon, a psychological potential present in each person; it is a meta-competence, an ability that can be applied in different fields. It has been long debated about the correlation between creativity and intelligence, but experts' opinions are still conflicting (Jauk, Benedek, Dunst & Neubauer, 2013; Kaufman & Plucker, 2011). According to Sternberg & O'Hara (1999) the relationship between intelligence and creativity may be declined into different possibilities: creativity can be a component of intelligence, intelligence can be a component of creativity, creativity and intelligence may overlap in part, may coincide or may not have anything in common.

Creativity is not easy to define, but if creativity is considered like a developmental changing (Feldman, 1999), childhood is a period particularly favorable for its increase. According to Rogers (1969), each child is competent in creative abilities, and fundamental are the role of the school and an attitude of unconditional trust in the capacity of the children, of absence of evaluation and a desire to get involved and share the children's point of view. Furthermore, some experts (Hoffman & Russ, 2012; Sanchez-Ruiz, Hernandez-Torrano, Pérez-González, Batey, & Petrides, 2011) have shown that emotional competences are related to creativity, but it is still unclear how this relationship vary in relation with other important aspects like age, gender and logical thinking. The present study aims at investigating the development of creative thinking in preschool and school age children in relation with age, gender and other psychological variables: non-verbal intelligence and emotion comprehension.

## Method

### Materials

We administered four test:

1. *Picture Completion Subtest of the Torrance Test of Creative Thinking (TTCT, Torrance, 1974)*: a test that measures the ability to realize creative products according to Torrance's 4 criteria: fluidity, the ability to produce many ideas; flexibility, the ability to varying category of idea; elaboration, the ability to add a lot of detail and elements; and originality. The task consist of 10 incomplete figures. Children are asked to complete the figures in order to create the image of something, possibly original, and to find a title for each drawing;

2. *Triangle Task (Pizzingrilli, 2012)*: a test that measures the ability to discriminate one's production between creative and non-creative. Children must complete the figure of a triangle, making a drawing first "like children usually do" and then, starting from the same shape of the triangle, making a creative drawing;

3. *Progressive Matrices (Raven, 1984, It. Validation by Belacchi, Scalisi, Cannoni, Cornoldi; 2008)* a test on fluid intelligence. Children must indicate the missing piece to complete an image;

4. *Test of Emotion Comprehension (TEC; Pons and Harris, 2000; Albanese & Molina; 2008)*: a test that evaluates nine components of emotion comprehension. At each child are told some stories of faceless characters, the request is to indicate the right emotion.

### *Participants*

The study involved 361 children, aged between 5 and 11 (mean age: 95,98 months, SD= 18,58), balanced between males and females (182 males and 179 females) attending the last years of a kindergarten school and a primary school in Northern Italy. Parents' consent was obtained for each child.

### *Design*

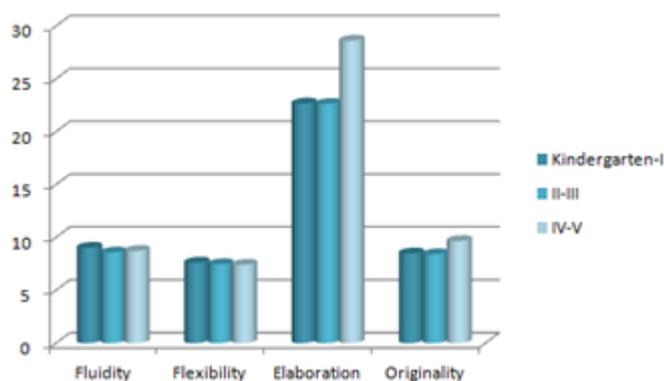
We conducted a cross-sectional research on the development of convergent and divergent thinking and emotion comprehension in children from kindergarten to primary school.

### *Procedure*

Tasks were administered individually in a quiet separate room, during the lesson time. The room-setting included two chairs and a table. We balanced the order of administration of the tests.

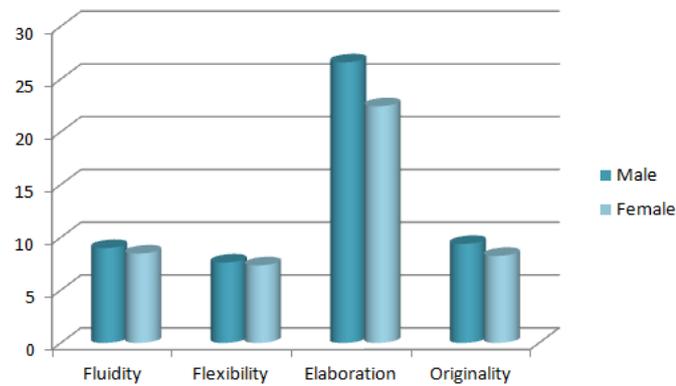
## **Results**

Results showed that creative competence does not increase linearly with age. Older children realize significantly more original ( $p < .01$  Post hoc Tukey: Kindergarten-I / IV-V and II-III / IV-V =  $p < .05$ ) and more elaborate ( $p < .005$  Post hoc Tukey: Kindergarten-I / IV-V =  $p < .01$ ; II-III/IV-V =  $p < .005$ ) drawings than younger children, but they produce fewer ideas and less inter-differentiated, even if not in a significant way.



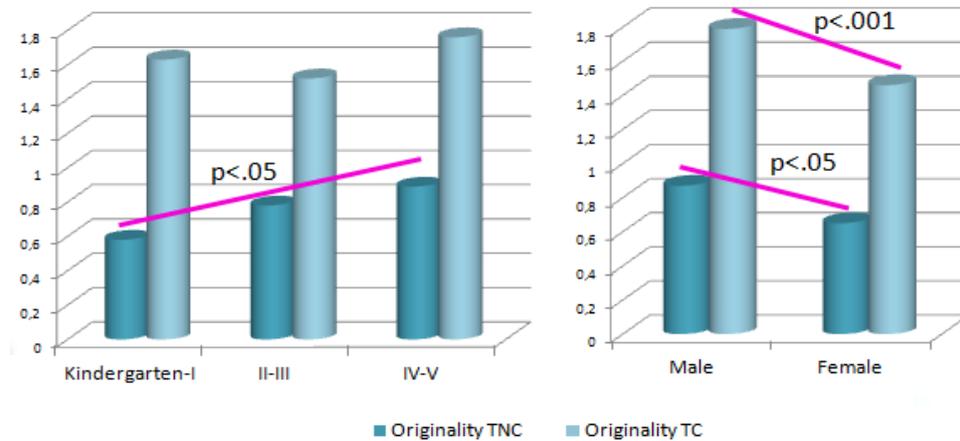
**Figure 1.** Mean scores at the Picture Completion Subtest, by attended class.

Males are also more creative than females (Fluidity:  $p < .005$ ; Originality:  $p < .005$ ; Elaboration:  $p < .01$ ), they produce significantly more ideas, more original and with more details.



**Figure 2.** Mean scores at the Picture Completion Subtest, by gender.

All the children are able to discriminate their production between creative and non-creative ( $p < .001$ ), even if in younger children the difference between creative and non-creative drawing is more consistent. Males are more creative than female both in the non-creative and in the creative drawing.



**Figure 3.** Mean scores at the Triangle Task, by attended class and by gender.

On the other hand, in line with the literature, non-verbal intelligence and emotional competence increase linearly with age ( $p < .001$ ) and there are no gender differences. Among the three investigated aspects interesting correlations emerged: non-verbal intelligence is significantly related to emotional comprehension ( $p < .001$ ): they follow the same development. Non verbal intelligence is also closely related to elaboration ( $p < .005$ ) and fluidity ( $p < .05$ ). Emotional comprehension is also related to originality ( $p < .05$ ) and elaboration ( $p < .005$ ).

## Discussion/Conclusions

Non-verbal intelligence and emotional competence increase significantly with the age, while creative abilities do not seem to be directly related to children's development: originality and elaboration increase with the age, but fluidity and flexibility remain constant or decrease, even if not in a significant way. Therefore, if creative ability is not directly related to the natural development of the child, context and personal experiences are fundamental. Children spend a lot of time at school with peers, so we hypothesized that a creativity training at school may be useful in order to develop this important skills.

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