



# Creativity development trajectories in Elementary Education: Differences in divergent and evaluative skills



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## ABSTRACT

The aim of this paper is to analyse the developmental trajectory during childhood of the divergent and evaluative skills implicit in the creative process. A total of 1491 children, aged between 6 and 12 years old, from seven Spanish schools participated in the study by answering the Test de Creatividad Infantil (Child Creativity Test). The aforementioned instrument is based on the theoretical framework of “problem finding” and covers both the creative process and the product. It requires designing a model with stickers -formulation of the problem and then later on producing a drawing based on the model -solving the problem. The results show three types of developmental trajectories: ascendant, irregular (with significant ascents and descents) and stable. Global Creativity describes a fundamentally ascendant trend, as well as evaluative skills. The divergent skills are characterised by presenting greater variability and irregularity, and experience the greatest decrease during the period analysed. Studies on gender differences show that boys had higher scores on Global Creativity and girls had more irregular trajectories.

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## 1. Introduction

Creative skills are particularly relevant in the early years, specifically during Elementary Education. There have been many studies on the creativity development in childhood, but the results are not yet conclusive. Just as there is no one overarching theory of creativity, there is no one comprehensive theory of the development of creativity (Russ & Fiorelli, 2010). Runco (2007) remarked that Piaget’s theory of adaptation is relevant to the development of creativity. There must be a perceived problem, a disequilibrium between assimilation and accommodation processes. This tension helps to trigger the adaptation course and begin the creative process. Following Piaget’s theory, Kohlberg’s (1987) model of moral development has been identified as one of the most useful theories to explain creativity development as it takes into account changes in conventionality. Rosenblatt and Winner (1982) used Kohlberg’ stages to describe the development of artistic skills and Runco and Charles (1997) applied it to divergent thinking. In essence, they proposed that individuals progress through a sequence of 3 levels with each level representing a qualitatively more sophisticated structure of reasoning: a pre-conventional or egocentric stage, a conventional or rule-following stage, and a post-conventional or principled stage.

This model has been used to explain critical descent of creativity during childhood. Most studies have focussed on the so-called “fourth-grade slump” (Torrance, 1968). Other studies have also found reductions in the development of childhood

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creativity between the ages of 8 and 10 (Lubart & Lautrey, 1995). Around this age, children develop reasoning abilities that can affect creative performance in a negative way as their thinking becomes progressively more logical and conventional (Lubart & Lautrey, 1996). Children's actions are frequently motivated by calculations of how they might give rise to disapproval by others. They internalize social norms and expectations and peer pressure may exert a strong influence on them. Runco (2007) states that these changes occur from normal maturational processes, as children enter a "conventional" stage in thinking and moral reasoning, as part of a necessary developmental path towards the adult's "postconventional" stage (Gardner, 1973, 1982; Winner, 1982). Other argument used to explain creativity slumps during childhood is the exposure to a rigid and structured school environment (Torrance, 1968).

But other studies, however, indicate increases in creativity related to age (e.g., Besançon & Lubart, 2008; Chae, 2003; Maker, Jo, & Muammar, 2008; Mouchiroud & Lubart, 2002; Smith & Carlsson, 1983). From this perspective, it is considered that older children are more creative basically because creativity grows through experience and knowledge. Sternberg and Lubart (1995) suggest that creative thinking involves the manipulation of ideas from a knowledge base. "The reason that one person produced some innovation, while another person did not, may be due to nothing than the fact that the former knew something that the later did not" (Weisberg, 1999, p. 248). Most of creativity's componential models (e.g., Amabile, 1996; Feldhusen, 1995; Runco & Chand, 1995; Sternberg & Lubart, 1995; Weisberg, 1993) include knowledge base as one of the basic components of creativity. A more complex understanding of reality, a wide and interrelated database helps creativity. Database includes children's own assessment criteria. They allow them to critically evaluate the quality of their ideas and meet the adequacy criterion. Older children, with wider experiences, knowledge and range of interest, would have a greater creative potential (Vygotsky, 1930/1998).

Understanding creativity development becomes more complex if we take into account the results of research that study the pattern said development follows. The proposals are, again very varied. From studies which propose ascendant linear development (Lau & Cheung, 2010; Mullineaux & Dilalla, 2009); those which propose a J-shaped relationship between the ages of 6 and 20 (Smolucha & Smolucha, 1985); a U-shaped relationship between 6 and 12 (Gardner, 1987; Rosenblatt & Winner, 1988), or between 3 and 6 years of age (Daugherty, 1993), or between fourth and sixth grade (Runco, 1991); or an inverted U-shaped relationship from first to fifth grade (Besançon & Lubart, 2008).

There may be various explanations for the diversity of results reported on the creativity development trajectories:

- a) Studies carried out with reduced samples which are not very representative.
- b) Studies which include relatively narrow age ranges covering only two or three school years or ages. Similarities between the levels may make the developmental trajectories discovered unstable (Lau & Cheung, 2010).
- c) Research on product not process.

The assessment of creative skills has been carried out focusing attention almost exclusively on the creative product, ignoring the process. The creative process is a way of thinking and working in which a person combines past experience with present experience, in such a fashion that arrives at a creative product. A creative product is one that possesses some degree of originality and usefulness (Moss, 1966).

Creativity has usually been evaluated with verbal and non-verbal divergent thinking tasks (Mullineaux & Dilalla, 2009). These tasks tend to pose "well-defined" initial situations and ask the subjects to produce as many ideas as they can within a specific time limit. However, in order to assess creativity it is preferable to use "ill-defined" problems in which the subject does not only give ideas to resolve the situation but also identifies and defines the problem in a personal way (Wakefield, 1991).

Problem finding means continuously and deliberately discovering and formulating new problems to be solved. It is the ability to identify the problem to be solved, which others may have missed (Russ & Fiorelli, 2010). Problem solving means developing new, useful, imaginative solutions to these problems (Basadur, Runco, & Vega, 2000).

In these terms, the model which has best defined and implemented the process of creative thinking is Getzels and Csikszentmihalyi's (1976) "problem finding model". It focuses on the creative process and states that finding a problem and defining it is already creative behaviour (Sternberg, 1988; Runco, 1994; Ward & Kolomyts, 2010). "Problem finding" is especially relevant during the preparation phase, but may occur throughout the entire creative process.

- d) Conflation of divergent thinking skills and creativity.

Divergent thinking has been the focus of many studies investigating creative processing and has often, incorrectly, been equated with creativity (Runco, 2008). Although one of the most commonly recognised components of the creative phenomenon is divergent thinking, it does, however, involve more than divergence.

Creativity is a process in which divergent as well as convergent thinking abilities are used. Convergent thinking refers to analytical thought processes, while divergent thinking is viewed as the more general process underlying fluent production of alternative ideas during creative problem-solving (Cattell, 1971; Getzels & Jackson, 1962; Guilford, 1975).

Divergent thinking facilitates the generation of ideas and helps to fulfil the criteria of originality of the creative response. But without a certain degree of adaptation to the environment in which the response is given, novelty alone is not identified with creativity. Evaluative thinking also plays a fundamental role in the creative process, permitting not only original but also appropriate responses (Runco, 2008).

It is understandable that the studies that focus on divergent variables report developmental trajectories different to those described in studies that take into account evaluative variables, such as the reorganization of information or redefinition of

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