

Theory and Practice of _____

CREATIVITY MEASUREMENT

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INTRODUCTION

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e are pleased to offer readers a new book in the area of creativity that focuses on an issue that is attracting and challenging the scholars of this phenomenon: its measurement or assessment. The main factor that mobilized us to organize the book was the growing demand for permission, by professionals from several areas, to use instruments developed by us that we have cited in our publications. (The appendices to this book print our instruments in full for the reader's use.) A second factor was the perception of a scarcity of publications in Brazil addressing the measurement of creativity. Although excellent texts related to creativity are already available in the country, offering a rich source of information about different elements that are associated with the expression of creativity in different contexts, the question of its measure has not been discussed extensively enough in the literature available in several countries.

Chapter 1: The Measurement of Creativity: Possibilities and Challenges presents an overview of different categories of measures, such as the main tests of creative thinking, instruments to identify interests, personality traits, cognitive styles that are associated with creativity, procedures for assessing the degree of creativity of a product, and alternate ways to identify the level of an individual's creative abilities. It also addresses some parameters to be considered when evaluating the quality of the available instruments, as well as the steps to be taken in their application and interpretation.

Chapter 2: Obstacles to Personal Creativity Inventory describes an instrument that allows for assessment of the main barriers that limit the expression of the individual's creative potential. Its premise is that awareness of these inhibiting factors may result in changes that facilitate overcoming them. The full instrument can be found in Appendix A: Obstacles to Personal Creativity Inventory.

Because of the importance that has to be given to education, especially in Brazil, where few have access to higher education, turning attention to creativity in the classroom becomes a key issue. Thus, in Chapter 3: Assessment of the Climate for Creativity in the Classroom, we present a tool for assessing a classroom's climate for creativity. This instrument aims to identify factors that facilitate or inhibit the expression of creativity in the school context. It can be used for diagnostic purpose of the climate for creativity in the classroom, especially in elementary school. Based on this diagnosis, intervention strategies can be devised in order to promote favorable conditions for the development of creative potential in the classroom. The full instrument can be found in Appendix B: Classroom Climate for Creativity Scale.

Continuing the focus on education, Chapter 4: Inventory of Teaching Practices for Creativity in Higher Education presents a tool that allows the evaluation of the perception of college students of the extent to which creativity has been encouraged by their professors. Such an evaluation may contribute to changes in teaching practices that could facilitate the creative expression of students and faculty. The full instrument can be found in Appendix C: Teaching Practices Inventory.

Returning to a more specific aspect of education, Chapter 5: Assessment of Creativity in Mathematics presents a test of creativity in mathematics. Because it is a discipline in which students often have difficulties, this measure can help identify gaps to be minimized in the teaching

of mathematics, so that this discipline can be a fertile space for the expression of creativity.

The final two chapters focus on specific measures in the organizational context. The Indicators of Climate for Creativity (ICC), which is an instrument that identifies a set of incentives and barriers to creativity in the workplace, is described in Chapter 6: Indicators of the Climate for Creativity in the Workplace, and printed in Appendix D: Indicators of the Climate for Creativity in the Workplace. Also, in order to facilitate its management in organizational contexts, Chapter 7: Strategies for Creating at Work presents a measure to assess creative strategies in the workplace, printed in Appendix E: Creative Strategies at Work. When aware of the strategies used by professionals at work, managers can trace strategic actions that facilitate the expression of creativity.

It is noteworthy that, in addition to describing the process of construction and validation of instruments, we present these instruments in their entirety. This makes it possible for interested professionals to use the different measures in their research or in their work practice, contributing not only to the advancement of knowledge about different aspects of creativity, but also to its flourishing in diverse environments.

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THE MEASUREMENT OF CREATIVITY

POSSIBILITIES & CHALLENGES

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he primary objective of this chapter is to discuss key aspects related to measures of creativity. It initially gives a brief history of studies of this construct, pointing out factors that prompted interest in its investigation, besides highlighting recent theoretical contributions and benefits of the development and use of procedures to measure various facets of creativity. Some main measurement instruments that have already been developed are listed in the text. The chapter also describes technical issues to be considered by those interested in making better use of the available assessment instruments of creativity, signaling their limits, possibilities, and also the precautions that should be taken in both the application and interpretation of their results. It's expected to be a source of inspiration for researchers in the area, unveiling new possibilities for research and for the promotion of conditions conducive to the development and expression of creative potential.

As widely reported in previous texts (Alencar, 2007; Alencar & Fleith, 2003b; Cropley, 2006; Nakano & Wechsler, 2007; Oliver, Shah, McGoldrick, & Edwards, 2006; Smith-Bingham, 2006), the importance of creativity in diverse contexts has been increasingly recognized, given its benefit not only for the individual but for society as well. As pointed out by Smith-Bingham (2006):

The future prosperity of developed and developing countries will increasingly depend on their capacity to innovate, to develop ideas into new products and services, to develop new technologies and new forms of production, to introduce products and services to new markets (p. 11).

Brief History of Studies on Creativity

The interest of psychology in the study of creativity and the conditions that favor its expression is relatively recent. This interest had its most significant starting point in the 1950s, as the result of several factors, such as the influence of the humanist movement. Rogers (1959) and Maslow (1959), for example, pointed to the human potential for self-actualization, describing the conditions that facilitate the expression of creativity, besides drawing attention to mental health as a source of creative impulses. Moreover, they conceived creativity as the result of a mutually beneficial interaction between the person and the environment. Rogers also considered autonomy and the resistance to excessive social control as necessary conditions for creative activity. Rogers signaled the role of society, allowing the person freedom of choice and action, as well as recognizing and encouraging the individual's potential to create.

Another factor that contributed to arousing the interest of psychologists was the speech of Joy Paul Guilford upon assuming the presidency of the American Psychological Association in 1950. On that occasion, Guilford (1950) drew attention to the neglect of research on creativity by American psychologists, noting that among the 121,000 titles indexed in *Psychological Abstracts* to that year, only 186 had to do with creativity. In his speech, Guilford stressed the importance of social creativity, especially

in finding new solutions to the problems facing humanity, and pointed to the need for a systematic study of its many facets.

From that moment on, different aspects associated with creativity have become the subject of numerous investigations, which have traditionally been classified in the following categories: person, process, product, and context (Runco, 2004). The first category includes studies related to personal characteristics, such as, for example, cognitive abilities, personality traits, motivation, learning styles, and creativity styles. The second, process, includes studies on operations and strategies that a person uses to generate and analyze ideas, solve problems, make decisions, and manage his or her thinking during the creative process. Studies have also been conducted on the properties of a product characterized as creative, especially in relation to its degree of originality and relevance. Context, the fourth category of research on creativity, includes elements of the culture in which creative activity occurs, such as values and norms prevailing in a given society, as well as other specific variables of the environment closest to the individual, such as the psychological climate of the workplace, physical environment, and available resources—human, financial, and even the time needed to develop and implement new ideas.

In relation to context, it should be noted that studies of creativity in the workplace have gained greater importance. An increasing number of investigations on creativity in organizations have taken place in the last 10 years. At the same time, different theoretical and methodological approaches were proposed to better understand creativity at work, especially as a means of promoting organizational innovation (Zhou & Shalley, 2008).

In recent theoretical approaches, such as the Investment Theory of Creativity (Sternberg, 2003; Sternberg & Lubart, 1995, 1996), the Componential Model of Creativity (Amabile, 1983, 1996b), and the Systems Perspective (Csikszentmihalyi, 1988, 1996, 1999), different factors that contribute to the creative expression are determined, including both personal variables that facilitate or constrain the expression of creativity and social, cultural, and historical elements that interfere in creative production, which interact among them in complex ways (Alencar & Fleith, 2003a, 2003b). Furthermore, according to these theoretical approaches, the individuals who stand out for their creative output rarely work in a vacuum, isolated from the social systems that constitute its domain of activity. Accordingly, Csikszentmihalyi and Sawyer (1995)

consider that many elements of the social context are present in different stages of the creative process, creativity being a psychosocial phenomenon whose expression is the result of both the individual and characteristics of his or her social environment or ecosystem. Montuori and Purser (1995) summarized this idea, arguing that creativity is as much a social as an individual phenomenon, and requires an interdisciplinary, historical, ecological, and systemic approach.

In parallel to the studies with respect to the different elements that are associated with creativity, a large variety of definitions emerged in the literature. Nine years after Guilford's speech drawing the attention of psychologists to the need for research in the area, Taylor (1959) counted more than 100 different definitions of creativity—definitions that were often conflicting, emphasizing different aspects of the phenomenon. This is certainly due to the fact that creativity, like intelligence, is a complex, dynamic, and multidimensional construct. These characteristics justify the difficulty of achieving a precise definition and explain the reason for the many conceptions already proposed for the term, which have prioritized different aspects, such as characteristics of the individual, creative processes, creative elements in the product, or environmental factors associated with creative expression.

Advantages of the Development and Use of Measures of Creativity

A misconception about creativity that dominated psychologists' thinking by the middle of the 20th century was the view that creativity is a magical and mysterious phenomenon, difficult to define and even more difficult to measure. It was also believed that the concept of intelligence was sufficient to explain all aspects of mental functioning and that intelligence tests could measure any process that occurs in the mind (Getzels & Csikszentmihalyi, 1975). It was believed that intelligence could apply to any person, but creativity was the prerogative of only a privileged few. The measurement of intelligence was accepted and valued; IQ, as a measure of intelligence, was widely known, perpetuating the idea that intelligence was a dimension easily evaluated. In regard to creativity, on the other hand,