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PROBLEMATISING MULTIPLICITY OF CREATIVE PROCESSES: A CRITICAL EVALUATION

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RESEARCH ARTICLE

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Abstract

Creativity Research since the 1950s has been structured around the Four 'P's of creativity. This article critically examines the compartmentalisation of creative production within this model, with particular attention to process-based approaches-Process, Product, Person and Press. The analysis problematises creative processes along three dimensions: temporality, universality, and multiplicity of processes. By examining dominant explanatory frameworks including divergent thinking, problem-solving, bisociation, intrinsic motivation, styles of thinking, metaphor generation, and associative processes, the article highlights the plurality of coexisting models within creativity research. It argues that the process-based approaches and person-based approaches cannot exist as two separate enquiries and one complements the other. Furthermore, the paper challenges claims of universality in creative processes by engaging with the domain-specificity principle, which emphasises that different domains operate under distinct rules, expertise demands, and developmental trajectories. A lifespan developmental perspective on cognitive processes is proposed as a more comprehensive alternative to momentary or context-limited models of creativity.

Keywords: *Four 'P's of creativity, Creative Processes, Creativity Research*

Introduction

Since the mid-twentieth century, creativity research has been structured around the influential Four P's framework – Process, Product, Person, and Press. This categorisation, initially proposed as a heuristic device, provided a systematic way to organise the expanding body of research on creative phenomena. Over time, however, the Four P's have evolved from an analytical convenience into relatively compartmentalised research traditions. Process-based studies examine the cognitive mechanisms underlying idea generation; person-based approaches focus on traits, motivation, and personality; product-oriented research evaluates creative outcomes; and press-based perspectives emphasise environmental and social influences. While this segmentation has enabled depth within each domain, it has also contributed to conceptual fragmentation within creativity research.

Among these strands, process-based approaches have been particularly dominant. From divergent thinking paradigms and problem-solving models to associative theories, bisociation, metaphor generation, intrinsic motivation, and styles of thinking, numerous frameworks have sought to explain how creativity unfolds cognitively. Yet these models often operate in parallel rather than in dialogue. The coexistence of multiple explanatory systems raises important theoretical questions about the temporality, universality, and multiplicity of creative processes. Are creative processes momentary cognitive events or developmental trajectories unfolding across the lifespan? Can a single universal process account for creativity across domains, or are creative mechanisms fundamentally domain-specific? And how should we understand the plurality of models that attempt to explain the same phenomenon?

Recent developments in creativity research, particularly the growing emphasis on domain-specificity, further complicate claims of universal creative processes. Different domains such as the arts, sciences, and everyday problem-solving operate under distinct norms, expertise requirements, and evaluative standards. These differences challenge the assumption that a single cognitive mechanism underlies all creative acts. At the same time, separating process-based inquiry from person-based investigation obscures the developmental and dispositional foundations of cognitive functioning. Creative processes do not occur in abstraction from individuals; they are embedded within motivational structures, expertise development, and lifespan trajectories.

This article critically examines the compartmentalisation of creativity research, with particular emphasis on process-based approaches. It interrogates three key dimensions temporality, universality, and multiplicity and argues that process and person perspectives are conceptually interdependent rather than analytically separable. By proposing a developmental lifespan

perspective on creative cognition, the paper aims to move beyond momentary models and toward a more integrated and comprehensive understanding of creative production.

Methodology

This article adopts a qualitative, theory-driven research design grounded in the systematic analysis of secondary sources. Rather than generating primary empirical data, the study undertakes a critical conceptual examination of existing literature in creativity research, with particular focus on process-based approaches within the Four P's framework. The objective is not to test a specific hypothesis but to interrogate dominant explanatory models and identify conceptual tensions relating to temporality, universality, and multiplicity in creative processes.

The analysis draws exclusively on secondary sources, including peer-reviewed journal articles, foundational theoretical texts, book chapters, and major review papers in creativity research from the 1950s to the present. Foundational works on the Four P's framework, divergent thinking, problem-solving models, associative theories, bisociation, intrinsic motivation, cognitive styles, metaphor theory, and domain-specificity were prioritised. Emphasis was placed on highly cited and field-defining contributions to ensure engagement with influential theoretical positions.

Discussion- Problematising Multiplicity of Creative Processes

The four P's in creativity research was identified by Mel Rhodes by collecting and analysing definitions of creativity and imagination. Mel Rhodes (1961) published the article titled '*An analysis of Creativity'* which argued that there are into four categories of definitions - creative process, creative product, creative person and creative environment. The creative environment is represented as press or place. Creative person definitions focussed on personality, traits, characteristics and idiosyncrasies. Product definition focussed on works focussing on a finished product like the work of art, patents, scientific discoveries, and ideas. Process definition focussed on cognitive processes that underlie creativity. Press definitions focussed on zeitgeist, culture, environment and evolution. Kaufman and Beghetto (2009) introduced two more P's in the classification based on magnitude – persuasion and potential. Approaches focussing on persuasion emphasised the ability of the creator to convince others about the creative product. The recognition of experts is a necessary component of creativity. The Potential research focuses on the creative potential of individuals, i.e., the unfulfilled or unexpressed creative talent. The area of this research includes everyday creativity, the creativity of children and support systems that help the promotion of creative talents.

Any attempt to study and problematise creativity cannot escape the question of the fundamental process behind it. Many works have employed the creative-person approach. The study of creative personalities based on idiosyncrasies and unique traits gives only a surface picture of the problem. The personal characteristics of a person is a result of a process of psychological maturation and evolution of mental functions. A study focused on a person will inevitably lead to the psychological processes animating the individual. The process-based approaches and person-based approaches cannot exist as two separate enquiries. One complements the other.

The product-based approaches focus on innovations, transformative ideas, creative performances that have novelty and usefulness. These approaches focus on the finished product rather than focussing on the characteristics of the creative person or creative process. The psychometric approaches use product-based approaches when it tests creative thinking on the basis of number and quality of associative processes or the flexibility of divergent thoughts. The creativity tests analyse the sample of the thinking process and assess the creativity or predict the creative potential of the individual. The product cannot be seen as separate from the individuals or the creative process involved. The nature of a creative product is reflected in the historical forces that operate in a person. For instance, an idea of an electric motor car is not possible without the invention of the very wheel. The creative product is a result of accumulated information digested by the individual to produce something of novelty and value. It is not always 'out of the box' as often portrayed, but very much employing the information within the box.

The only question that remains when connecting the person-based approaches and process-based approaches is the extent or scope of the processes one addresses at a time. The temporality of creative process considered is very crucial in the analysis of creativity. The time span of consideration in the current approaches varies from the momentary to the developmental span of the individual and development span of culture. A majority of current approaches towards creative processes focus on the momentary process. The individual's mental processes are assessed based on the mind formations in the immediate context with the help of mental tests. This approach is similar to taking a sample of water from the flowing river. The studies on associative processes, divergent thinking, problems solving, metaphors and analogies focussed on the momentary samples of creative thought. Most of the studies exploring the processes revolved around the divergent thinking aspect of creative thinking.

Studies point out various processes involved in creative thinking and problem-solving. These include special problem-solving skills, attitudes, divergent thinking, mixing of incompatible matrices, metaphors and analogies and unique types of associative thinking. The popular and accepted process model in creativity research is that of divergent thinking. Research works on divergent thinking, and its relation to creativity started in the 1950s in the United States. This concept is used traditionally in a different context in the early 20th and late 19th centuries as used by Binnet and Simon (1905) (Runco & Acar, 2012). The experience in the war front helped the psychologist J.P. Guilford to identify the importance of divergent thinking. The IQ tests which was used extensively in the world war predicted the intellectual capability of soldiers, but Guilford found it as not comprehensive in encountering emergencies which demands 'out of the box' responses. Divergent thinking is often contrasted

against convergent thinking. According to Guilford, the later helps in arriving at the correct answers, which function in more or less like logical deduction or induction. The SOI model of Guilford was inclusive of both the processes.

Every divergent thought is not a creative thought. The standards and measures used to assess the quality of divergent thinking are fluency, flexibility and originality. Later another component of elaboration was added to it. Fluency is the number of ideas generated by the individual. Flexibility represents the range of different categories used in thinking or solving a problem. Originality represents the uniqueness and novelty of the ideas. Many researchers studied the divergent thinking process to conceptualise, measure and predict creativity (e.g., Guilford, 1966; Khandwalla, 1993; Runco & Acar, 2012). According to Runco, Divergent thinking measures will point to potential-creativity and problem-solving. The divergent thinking tests, as well as the creativity tests, use the four standards to measure creativity. The debated over validity, reliability, and prediction of divergent thinking tests establish that divergent thinking is regarded as a predictor for creative potential but not a guarantee to creativity.

There were attempts to explore the mechanism of divergent thinking. The construct of Bisociation by Arthur Koestler (Koestler, 1964) attempts the same purpose. It distinguishes routine skills of thinking from creative thinking; the former is single-minded and later double-minded. It combines two incompatible matrices; the process is the basis for discoveries in science and art.

> "Historically speaking, the frames of reference of magnetism and electricity, of physics and chemistry, of corpuscles and waves, developed separately and independently, both in the individual and the collective mind, until the frontiers broke down. And this breakdown was not caused by establishing gradual, tentative connections between individual members of the separate matrices, but by the amalgamation of two realms as wholes, and the integration of the laws of both realms into a unified code of greater universality." (Koestler, 1964, p. 442)

Koestler tries to give a universal picture of creativity. By matrix, Koestler meant any pattern of ordered behaviour such as habits, skills, abilities that have a code of fixed rules (Koestler, 1964, p. 11). Every combination of two incompatible matrices may not produce creativity. Further, the question of the creation of matrices remains unsolved.

Several studies of creativity have approached the problem under the lens of problem-solving (e.g., Mumford, Supinski, Baughman, Costanza, & Threlfall, 1997; Reiter-Palmon, Mumford, O'Connor Boes, & Runco, 1997; Runco & Nemiro, 1994). The cognitive psychological approaches towards problem-solving are very recent. The Gestalt School of psychology initiated earlier studies in problem-solving. The fundamental focus here is the nature of perception. A successful problem-solving is guided by insights which are a sudden rearrangement of perception and ideas that lead to the solution of the problem. The Gestalt position is often contrasted with the behaviourist position of trial-and-error theory.

Problem-solving is a general cognitive task. It does not specify more on the nature of processes involved in creative thinking. Research studies point to associative processes and divergent thinking playing a supportive role in problem-solving. Getzels & Csikszentmihalyi (1976) introduced the idea of problem-finding. They found that an artist working on an artwork uses proximal goals rather than fixed goals. The creative works in the art are not done with a pre-planned picture, but the artist improvises in the course of the work. Rather than solving a problem, the artist seeks new complexities which improvise the artwork and make it appealing. Various aspects of problem-solving have been explored by researchers such as problem finding, problem definition, problem expression and problem construction (Runco & Nemiro, 1994). These are various shades of mental processes the individual employ in dealing with a problem.

Are these processes the core engine behind creativity or problem-solving? If these are the core processes, then it should be universal, i.e., it applies to all conditions and domains of knowledge. However, creativity research experts like Csikszentmihalyi, Gardner and Runco suggest about domain specificity in activities and knowledge forms. The problems in mathematics are different from the problems in art in the context of the time required to master it and the nature and type of cognitive processing required. In other words, the nature of the domain determines the creative production in substantial ways. The intra-psychic conceptualisations of mental processes stand as a barrier to the holistic understanding of the concept.

Problem-solving is classified into two - logarithmic and creative. The first one is following a series of logical steps to reach the solution. The second one involves divergent responses rather than fixed responses according to the circumstances. These are the general type of tasks that an individual is familiar with. Specific tasks demand fixed responses, while certain other tasks demand the best responses. According to this classification, switching on television is logarithmic problem-solving, whereas writing fiction is creative problem-solving. However, even in creative tasks, there are rules or open-ended logic. A soccer player in the football field can play uniquely and smartly; still, it has to within the rules of the game.

Certain studies debate on the cognitive and conative aspects of creative problem-solving (Davidson & Sternberg, 2003, p. 135). The former is concerned with thoughts, thinking, planning, and execution, whereas the later is action-oriented aspects of behaviour like motivation, desire, inspiration, volition and purposeful action. Such a distinction is visible in leading creativity theories. This distinction is similar to the age-old problem of the connection between affect and intelligence. For instance, Amabile's componential Model recognises Intrinsic motivation as a motivational component and domain-relevant knowledge as a cognitive component. The Investment Theory of Creativity differentiates intellectual aspects such as analytic skill and synthetic skill from the motivational aspects of creativity. We can observe a separation of cognitive, affective and conative aspects of persons' mental functions both in the conceptual frameworks of creativity studies and in the discipline. The fundamental question here is how can thinking exists as its own? Is thinking a separate entity from the motives and interests of the individual? Does such conceptualisation solve our problem regarding the comprehensive characterisation of mental structure? Ideas exist along

with the remnants of the individual affective component as a dynamic system. The question of, can particular styles of thinking power the creativity of an individual lays over a complex problem of what constituted such thinking styles.

Many researchers have explored the effect of metaphors and analogies in creative thinking (e.g., Gold, Faust, & Ben-Artzi, 2012; Marin, Reimann, & Castaño, 2014). A metaphor helps in seeing the problem, domain, situation and broad context in a new light or perspective. Metaphor helps in the generation of insights that help in problem-solving processes. It helps in formulating or re-formulating the problem and advancing the solutions. At the event of declaring or familiarising the work or creation with the audience or experts, metaphors help to ground the new information in the base of common knowledge. The generation of metaphor in terms of its core process has rarely been studied and is a mystery (Lubart & Getz, 1997, p. 288)

Another approach is the study of associative processes in creative thinking. Sarnoff A. Mednick (1962) study of Associative processes in creative thinking sees creativity as the formation of associations of elements, in new combinations that are useful or may meet specified criteria. This association may happen in three ways; Serendipity, Similarity and Mediation. The similarity of associative elements or similarity of stimulus eliciting them may lead to the required contiguous association of elements. When the environmental stimuli elicit, often accidentally, contiguous associative elements then it is termed as serendipity. When a common element mediates the association, especially in subjects of symbolic use like mathematics and chemistry, it is termed as mediation.

Creative people show flatter associative hierarchy, i.e., the individual response to a stimulus or situation is diverse and not common. This is against the steep associative hierarchy, i.e., the individual will respond with responses of usual associative strength. The study suggests that rather than the special organisation of associative memory, the effective access of memory contents determines creative thinking.

Conclusion

The process-based approaches and person-based approaches cannot exist as two separate enquiries. Both are complementary to each other. The creative processes discussed here include Divergent thinking, Problem-solving, Bisociation, Intrinsic motivation, styles of thinking, metaphor generation, problem-finding and Associative processes. A significant issue regarding the nature of the creative processes is temporality. Majority of the processes discussed in the study were limited to momentary timespan. However, the cognitive system is a result of historical and cultural interaction with the environment. The data for creative production is sourced from the richness of culture. An approach which considers a developmental lifespan of the cognitive processes by tracing the origin, development, and transformation of cognitive structures is comprehensive and appropriate.

Another challenge is the question of the universality of creative processes. The recent findings suggest that creativity is domain-specific. Creative production in different areas such as mathematics, poetry, and architecture use special domain rules. Each domain demand very specific creative processes and expertise. The recent models, such as the confluence models and system models, bring together many processes and cognitive processes into a single explanatory framework. Such approaches are comprehensive and eclectic in exploring the phenomena of creativity.

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