

CREATIVITY

María Luisa Vecina Jiménez
Universidad Complutense, Madrid

This article belongs to the field of Positive Psychology, and defends the view that creativity is not something extraordinary, within reach of only a few chosen people. Different psychological research lines on creativity pursued over more than half a century appear to be converging now in some basic premises that will help to dispel some of the myths and encourage researchers to explore personal creativity in a more general way and in everyday contexts.

Key words: *creativity, positive psychology.*

Este trabajo se enmarca en el contexto de la Psicología Positiva y en él se defiende que la creatividad no es algo excepcional al alcance de unos pocos elegidos. Las diferentes líneas de investigación en las que la Psicología viene trabajando desde hace más de cincuenta años parecen converger hoy en algunas premisas básicas que animan a quienes pensaban que la creatividad era un campo vedado a superar algunos mitos y a explorar la creatividad personal cada día.

Palabras clave: *creatividad, psicología positiva.*

Creativity is a research topic of the utmost importance, given its personal, social, cultural and even economic consequences. It is concerned with people's performance in a wide range of contexts and with their optimum functioning, with innovation, with the solution of all types of problems, with scientific and technological advances, with social changes, and so on. In sum, creativity can be considered one of the most important characteristics of human beings, and therefore of their productions.

Beyond these few general ideas, it is difficult to discuss creativity without some degree of confusion. Indeed, we find, somewhat disappointingly, that works in this field are either a compilation of unverifiable beliefs and opinions or, in contrast, deal with scientific issues so specific as to be irrelevant to the majority of people. The study of creativity, by its very nature, often appears incompatible with the requirements of a science, at least of a predictive science (Popper, 1956), but this does not mean we do not perceive the phenomenon everywhere, and feel the need to explore it in greater depth.

Despite its complexity, psychology has dedicated great efforts to unravelling the mysteries of creativity over many decades. There is some consensus on the view that modern interest in the topic can be traced back to the work of J. P. Guilford, the eminent American psychologist who in 1950 gave a brilliant lecture to the American Psychological Association entitled quite simply "Creativity" (Guilford, 1950).

Correspondence: María Luisa Vecina Jiménez. *Facultad de Psicología. Universidad Complutense. E-mail:* mvecina@psi.ucm.es

RESEARCH ON CREATIVITY

An overview of the research lines developed within psychology reveals that creativity has been studied from different perspectives which, rather than conflicting, can be considered as complementary and convergent (Sternberg, 1996).

Early approaches to the topic focused on the study of the biographies of people considered as creative geniuses (Cox, 1926; Galton, 1869; Gardner, 1993; Simon, 1975a), though the technical and methodological difficulties involved in this approach make it advisable to judge its results with caution. Researchers have also analyzed the characteristics and personality traits of normal, everyday people, applying paper-and-pencil tests to them on the assumption that creativity is a normally distributed trait (Guilford, 1967; MacKinnon, 1965, 1978; Nicholls, 1972; Runco, 1991; Torrance, 1988). Another important and fruitful line of research has looked at the cognitive processes of perception, reasoning and memory involved in problem-solving. From this perspective, creativity is the extraordinary result of the functioning of ordinary processes and structures, and can be reduced precisely to processes of association, synthesis, analogical transference, use of broad categories, data recovery, and so on (Boden, 1991; Finke, 1990; Finke, Ward & Smith, 1992; Johnson-Laird, 1988; Newell, Shaw & Simon, 1958; Smith, Ward & Finke, 1995; T. B. Ward, Smith & Vaid, 1997; Weisberg, 1993).

To a lesser extent, research has turned its attention to the possible environmental, social and cultural determinants of creativity, such as cultural diversity, war, the

availability of models and resources (Lubart, 1990; Simon, 1975b, 1984, 1998), external and internal rewards (Amabile, 1982, 1983), or the disciplinary context in which creative productions occur (Csikszentmihalyi, 1996).

More operative approaches have studied the characteristics of the creative product, such as its novelty, aptness, utility, quality or parsimony (Amabile, 1985; Barron, 1955; Besemer & Treffinger, 1981; Bruner, 1962; Getzels & Csikszentmihalyi, 1976; M. I. Stein, 1969).

Finally, perhaps the most well known approach is that which has focused on the development of creativity in applied contexts. Commercially successful techniques such as “brainstorming” (Osborn, 1963) or “thinking hats” (De Bono, 1971, 1985, 1992), which stress the need to propose as many ideas as possible and to suspend their judgement for later, have helped improve results in a wide variety of fields.

Obviously, such a diversity of approaches has not produced a single, unified definition of creativity; in fact, each approach contributes its own definition, none of which manages to avoid the problem of the lack of an objective criterion that could lead to a consensus. In these circumstances, Teresa Amabile (1983) advocates omitting the search for totally objective definition criteria and adopting an operative definition based on reliable subjective criteria. She proposes working with definitions such as the following one:

“A product or response is creative when appropriate observers independently agree that it is. Appropriate observers are those who are familiar with the domain in which the product was created or the response was articulated” (Amabile, 1982) (p. 359).

Another conceptual definition by the same author that helps us to understand what observers are analyzing when they assign degrees of creativity is the following one:

“A product or response will be judged as creative insofar as it is a novel, appropriate, useful, correct or valuable response to the task at hand, and the task is heuristic rather than algorithmic in nature.” (Amabile, 1982) (p. 360)

These types of definition that rely on intersubjectivity as a criterion of objectivity are useful for researchers because they make it possible to start out from a basis of consensus that facilitates reliable comparisons between results. However, for the vast majority of people, who have no interest in applying the scientific method to their

everyday lives, what matters is to know how to develop and appreciate creativity in their immediate environment. Therefore, in the present work, which falls within the framework of Positive Psychology, we shall argue that creativity is within reach of all, that its development is possible and that it has substantial positive effects.

WHAT IS CREATIVITY?

Opting for a minimal definition that maximizes the consensus among students of creativity and its potential for development, we propose that creativity is, above all, a form of change.

From an evolutionary point of view, human beings feel a certain ambivalence toward change. On the one hand, we appreciate it, because it has permitted us to adapt in spectacular ways to all the environments in which we have lived, and on the other, we are somewhat resistant to it, because it always brings with it uncertainty, instability and disorder, and makes it more difficult to make predictions about our environment and to control it. We thus find ourselves between two extremes with regard to change, where the most adaptive approach is to function mainly in the middle ground. Applying this idea to the specific question of creativity, we might say that we appreciate it, but not in excess. It is adaptive and progressive to introduce novel aspects into fields in which we deploy our intelligence, but always on the basis of solid foundations and socially validated knowledge, because, in the absence of a better criterion, social consensus is essential.

More specifically, it can be asserted that to create is to invent possibilities (Marina, 1993), it is an exercise of freedom that in the animal kingdom only the human brain can develop, because it is determined not by external stimuli, but by the projects and goals it creates itself. Indeed, the human brain creatively constructs *itself* (Edelman, 1987); it comes unprogrammed, and must be programmed in order to survive, and this could be considered the most significant and vital exercise of creativity. If this be the case, then artists recognized for their magnificent works, scientists who discovered the invisible, people who have gone down in history for their discoveries, have simply extended this capacity to exploit potential that all of us possess.

From this broad perspective, creative people are those who see in a set of stimuli what they had not seen before, or what nobody had seen before. The creative process is that which leads to the formulation of a new theory, to



the production of an original work of plastic art, to the development of an ingenious product that solves some practical problem, and so on. The creative product, response or idea is that which combines characteristics of novelty, originality, utility, applicability to a given problem, and so on. And also creative is the process of perceiving all this, for on looking at a painting one person may perceive a group of splodges of colour, while in another person the image may stimulate them to see the world in a different way. People may see the work of Dalí as meaningless eccentricity, or as the height of provocative originality; often lack of creativity is more a problem of those who have to appreciate it than of those whose contributions attempt to express it. Csikszentmihalyi suggests in this regard that what restricts creativity is not always a lack of products, ideas, or novel and original works, but rather the lack of interest expressed by observers. It would be a question, therefore, not so much of creative supply, but of demand, and it seems ironic that the majority of attempts to stimulate or promote creativity focus on the supply side (Csikszentmihalyi, 1996).

WE ARE SURROUNDED BY CREATIVITY

Creativity pervades all fields in which human intelligence is deployed. We can find abundant examples in the fashions of each season, in advertising campaigns, in the inventions that have revolutionized our everyday life (from the washing machine to the computer, via post-its, sticking plasters, etc.), in technological innovations, in the scientific discoveries that have even taken us into space, in haute cuisine, in literature, in painting, in sculpture, in theatre and cinema, in music, in interior and exterior design, and so on. We may never achieve a total consensus on which specific creations and which persons merit such recognition – we may have to wait some time and make retrospective judgements – but what seems clear is that changes are happening all the time, that new combinations of elements continually surprise us, and that if we look back even just a few years we see that such things have transformed everyday reality. As Boden remarks, “we believe in creativity (...) because we find it in practice” (Boden, 1991) (p. 51).

WHO IS RESPONSIBLE FOR THE CREATIVITY THAT SURROUNDS US?

First of all it is people who possess a biological information processor called a brain, the vast majority of whom go or have gone unnoticed, and who set in motion, more

or less consciously, ordinary, everyday cognitive processes (Smith et al., 1995; Weisberg, 1993). Psychological studies developed in this field show up the mystery of divine inspiration for what it is, and substitute it with scientific knowledge on processes of association, verification and residual activation (Bowers, Farvolden & Mermigis, 1995), visual image processing (Finke et al., 1992; Martindale, 1990; T. Ward, Smith & Finke, 1999), divergent thinking (Guilford, 1967), and so on. Thus, creative thinking is accessible to anyone, and by extension, so are creative results (Simonton, 2000).

Who has not done something they hadn't done before, or in a way different from how other people around them had been doing it? Who has not had a new idea in a specific situation, which moreover has won the approval of others, and which has helped us to improve our capacity for adaptation to the environment and that of those around us? Who has not made a daring combination of elements in the kitchen, in one's wardrobe, in the decoration of one's house, or in the organization of one's work? If such actions have not been judged as creative by others, it is not so much because they are not actually creative, but rather for practical reasons: if we are all creative, then creativity is a human characteristic and it does not make much sense to talk about it. Creativity is precisely what is expected.

To say that we are all creative is like saying nothing, and the truth is that our purpose and intention here is precisely to say *something* about this important element that has made such a notable contribution to our survival. Indeed, we tend to identify and describe creative people, we rank them, we investigate their lives in search of explanations for their creativity, because it seems this has turned out to be useful for our adaptation. We judge as creative that individual – it is not yet clear from which species – who first saw the potential for a cutting edge in a simple stone, the one who observed the cycle of the seasons and acted in consequence, the one who planted a seed in the hope that an edible plant or fruit would grow from it; more recently, we consider as creative people Michelangelo, Darwin, Edison, Mozart, Picasso, Marie Curie, Bill Gates, and so on. Those people who, for the contributions they are recorded to have made, are today called creative geniuses, are particular examples of our species who have built on the observations, the knowledge and the productions of others and have contributed something more definitive – we might say they have “dotted the i's and crossed the t's”, or taken



the product to a new level of perfection or quality – and that is why they merit such a label, and why they deserve to be remembered and studied.

Creative people are not made of special material, though saying that they are is intended to make it easier to understand them. We are all made of the same stuff, and we all have great creative potential. Creativity is a question of degree (Amabile, 1983; M. Stein, 1974, 1975; Sternberg & Lubart, 1995), and some will be in the right place at the right time and with the necessary resources to make important discoveries that merit consideration as creative. But for this to happen the person also has to be prepared, adequately trained and ready for something exceptional to happen at any moment.

From the point of view of those who perceive creativity and have to judge it, it is necessary to take into account the significant limitations of human perception and memory (Kahneman & Tversky, 1982). We cannot pay attention to, or remember, or therefore appreciate all those that have stood out, and even less all those who made smaller contributions but necessary ones so that others could make more important discoveries. In such circumstances, it is more practical to select a few, label them as creative, study their characteristics and try to learn from them.

For this practical reason we begin by discussing creativity as a differential characteristic, which some have and others do not have. We ask ourselves about the characteristics of those whom we have decided to label as creative, how they lived, what made them different from others, and so on. But this is no more than a strategy that allows us to go deeper and to learn more from those who have stood out most. It is not a reality: the reality is that we are all creative. And we are creative because we have no choice, because even if we do not want it to, our brain discovers, invents, tests and makes associations, and through this it creates new possibilities and constantly changes the environment (Marina, 1993), for good or ill.

MYTHS ABOUT CREATIVITY

Research on creativity has been dominated for many years by the approach focusing on traits, in an attempt to identify the personality characteristics of creative people (Nicholls, 1972). As a result, some other important areas have been neglected, such as the influence of the physical, social and cultural contexts in which those considered as creative have produced their creations (Amabile, 1983). Furthermore, it has generally been assumed that creativity cannot be altered, and also that creative

people can produce creative work at any time and in any field. Neither of these assumptions appears to be true. Creativity can be developed, and those who concentrate on specific fields are obliged to neglect others (Csikszentmihalyi, 1996), since being creative requires effort, which is, unfortunately, a scarce resource that we have to measure out with care.

Studies focusing on the process of the development of creativity seem to indicate that exceptional creative talent is made (Ericsson, 1996), and that manifesting creativity in any field requires a previous period of learning (Hayes, 1989; Simonton, 1991). Creative ideas do not come out of a void; rather, they emerge from people who have developed a wide range of skills and who have access to a rich body of relevant knowledge, previously acquired in favourable contexts (Simonton, 2000). Moreover, creative ideas and productions, after their creation, pass through stringent processes of selection according to the opinion and judgement of experts in the field, as a result of which only a scant few are considered worthy of passing on to the next generation.

A more serious assumption is that creativity and pathology are related phenomena. Unfortunately, it is easy to dismiss as crazy those whom we simply do not understand. Moreover, the widespread tendency to overestimate the degree to which two events occur together, especially when one of them has great emotional impact, may be at the root of this unfounded association. Today, many authors assert unequivocally that this relationship is purely accidental (Amabile, 1993; Csikszentmihalyi, 1996; Rothenberg, 1990; Simonton, 2000). There are many more people considered as creative that have enjoyed good physical and mental health (Cassandro & Simonton, 2002). The capacity for discovering what one does well, and for enjoying doing it, is the mark of creative people (Csikszentmihalyi, 1996), and not the suffering that romantic notions would have us believe.

COMPONENTS OF CREATIVITY

Creativity does not depend on divine beings or on an exceptional personality; rather, it results from a particular combination of personal characteristics, cognitive abilities, technical knowledge, social and cultural circumstances, resources, and a large dose of luck.

Personality traits

Studies carried out from the traits perspective tend to coincide in suggesting that people judged as creative have

some common characteristics. Among the traits attributed to them are the following: a certain propensity to take risks, nonconformity, a liking for being alone and for setting new rules, independence of judgement, and tolerance of ambiguity (Eysenck, 1993; MacKinnon, 1965; Martindale, 1989; Simonton, 1999; Sternberg, 1985).

Intelligence and capacity for work

People judged as creative tend to be hard-working and steadfast. They have strived over many years to master a specialized field, so that they have access to relevant skills in specific areas of activity. For example, they have precise knowledge of paradigms, theories, techniques and currents of opinion (Amabile, 1983; Csikszentmihalyi, 1996). Obviously, one cannot be creative in nanotechnology if one knows nothing about nanotechnology; nor can one become a creative painter if one does not know that the mixture of blue and yellow gives green. Intelligence is a necessary component for the acquisition of knowledge and skills, but it is not sufficient for guaranteeing creative results (Amabile, 1983; Barron & Harrington, 1981; Sternberg, 1990).

Also important are other abilities related to working style, such as the capacity to maintain effort over long periods or the ability to abandon unproductive strategies and put persistent problems temporarily to one side (Amabile, 1983).

Motivation

Motivation would be another basic ingredient of creativity. This includes positive attitudes toward the task at hand and sufficient reasons for undertaking it in certain conditions (Amabile, 1983). The presence of rewards, external or internal, is critical for motivation; intrinsic motivation to carry out a task will raise the probability of creative results, while extrinsic motivation will reduce that probability. Indiscriminate reinforcement, prescribed by some professionals for raising self-esteem, may have negative consequences for creativity on balance (Csikszentmihalyi, 1996), first of all because it interrupts the concentration necessary for developing a product, and secondly because it increases the visibility of external rewards, reducing intrinsic motivation (Amabile, De Jong & Lepper, 1976).

Cognitive styles

Creativity has also been associated with a disposition for acting in a particular way, characterized by a preference

for open and abstract problems, and by flexibility for adopting different points of view, for exploring alternatives, for keeping response options open, for suspending judgement, for using open categories, for working outside established action scripts, and so on; finally this way of acting is also characterized by accuracy of recall (Amabile, 1983; Eysenck, 1995; Sternberg, 1988).

Heuristics of creativity

Heuristics are simple rules that permit us to make decisions and make value judgements very quickly and with very little cognitive effort. Such clear advantages are sometimes accompanied by error risks in the judgements or decisions, but in other cases this approach may result in the exploration of new cognitive paths. Examples of the latter type of case would be the following heuristics: “when everything goes wrong you have to try something counter-intuitive” (Newell, Shaw & Simon, 1962), “you have to make the familiar unfamiliar” (Gordon, 1961), and “hypotheses must be generated by analyzing case studies, using analogies, considering exceptions and investigating paradoxes” (McGuire, 1973).

External resources

A minimum of resources is necessary for being able to create anything, but beyond this minimum, what may occur is similar to what seems to occur in the case of happiness – that significant increases in resources are not associated with proportional increases in creativity; indeed, at very high levels the opposite effect may be found: “If necessity is the mother of invention, opulence surely seems to be its dysfunctional stepmother” (Csikszentmihalyi, 1996). The more comfortably-off the person, group or society, the fewer their reasons for seeking change, and the less creativity we would expect them to show.

The result of all this mix in specific contexts can give rise to great discoveries or to small revelations that have an impact in the sphere of private life. Creativity with a capital C involves the contribution of something truly new to a symbolic field, and its being sufficiently valued by other people, including experts in the field, so as to be incorporated into the culture. Cultures, it should be borne in mind, are conservative when it comes to incorporating new ideas. There is in fact fierce competition between units of cultural information (memes) to succeed in being transmitted to the following generation (Csikszentmihalyi, 1996; Dawkins, 1976), so that writing a page in the his-

tory of humankind is something reserved for a select few. In such circumstances we should consider that what really matters in the end is not whether your name was linked to some widely recognized discovery, but rather whether you have lived a full and creative life. Developing creative potential in the context of everyday life, creativity with a small c, does wonders for quality of life, but we should not expect others to go into raptures over our contributions, since this depends on other factors which, for our personal happiness, do not matter that much.

WHAT IS THE PURPOSE OF CREATIVITY?

Functioning in life with all the available potential is the optimum and desirable state of affairs. Creativity as a human characteristic is the motor of change, of progress, and in sum, of evolution. Creativity is to cultural evolution what genetic mutation is to natural evolution (Csikszentmihalyi, 1996), and we can all contribute something to cultural evolution, even if we are not remembered for it.

More specifically, creativity can be considered as the antidote to the boredom of everyday life. While creativity may not lead us to fame or fortune, it can do something which from the individual point of view is even more important: it can make everyday experiences more vital, more pleasant and more gratifying (Csikszentmihalyi, 1996). If we learn to be creative in the everyday context we may not change the way future generations see the world, but we shall change the way in which we experience it (Csikszentmihalyi, 1996), and that is a worthwhile goal in itself.

The sphere of personal life contains the rules, habits and practices that define what we do every day – how we dress, how we work, how we go about our relationships, and so on. Reflecting on it, consciously choosing our options and being open to new possibilities are also exercises of creativity related to personal satisfaction, because doing what we do not usually do simply because it does not occur to us, and seeing what we do not usually see because we do not pay attention, at the very least enriches our stimular world and that of those around us, and a little beyond that opens up a world of new possibilities, some of which can be highly advantageous in the continuous process of adaptation to the environment.

Trying consciously to develop creativity in any field involves a degree of reflection which, moreover, serves to counteract automatic behaviour, conditioned behaviour, and processes of conformity and obedience that lead us to do always the same thing, in a routine and predictable

way. In the sphere of interpersonal relations, for example, it can lead us to perceive others and what they do from broader perspectives that contribute to improved understanding. Thinking, as we habitually do, that others' behaviour has only one possible cause, which, moreover, annoys us, is not particularly helpful for building satisfactory interpersonal relationships. Thinking, on the other hand, that there may be various reasons why someone does something, looking into them and trying to understand them, at the very least favours communication and constructive interaction, and this could be considered an exercise of creativity aimed deliberately at perceiving what we generally do not perceive, and doing what we do not normally do.

Creativity can also be considered a valuable therapeutic resource with regard to health. It could be hypothesized that people with some psychological disorder are showing a lack of creativity when they react in a rigid way to what is causing them problems, and do not try to modify the conditions, internal or external, that cause them, or try unsuccessfully. Therapeutic strategies of the search for alternatives, of correction of cognitive errors, of behavioural training, etc., constitute techniques that basically seek changes in the way the patient interprets reality and copes with situations, specific changes in behaviour and in attitudes, and so on. In sum, they seek to demonstrate that doing something different from what one has been doing is possible. Therefore, they can be broadly conceptualized as strategies that stimulate or promote abilities closely related to creativity, in these cases for achieving a minimal goal, but also potentially – and why not? – for making life worth living and developing activities that bring into play the best in us.

HOW CAN CREATIVITY BE TRAINED?

First of all, by cultivating curiosity and interest, that is, by assigning attention to things for their own sake (Csikszentmihalyi, 1996). We should question the obvious, not in a spirit of contradiction, but rather with the aim of adding other possible explanations to those already accepted, and other possible solutions to those already implemented. In reality, surprising things happen every day, and it is difficult, if not impossible, to pay attention to them all, but if one of them sparks an interest, paying conscious attention to it is a first step on the road to deploying our creative potential.

Secondly, by extending our capacity for perceptual discrimination. What artists reflect in their work, what a re-



searcher contributes to a given field of knowledge, is not reality, but rather the way in which that reality is interpreted. Before seeing something that nobody has seen before, there clearly occur learning processes that lead to the perception of innumerable differences and nuances in the initial stimuli. We might drink a glass of wine and perceive that we are ingesting a red liquid that is useful for washing down solid foods, or we may experience an amazing richness of smells, tastes and sensations. What professional wine tasters are capable of seeing, tasting, feeling, etc. in a glass of wine are things they have learned. They have learned to recognize parts of a stimulus in a perceptual learning process that naturally requires interest, effort and time, and which many people would be in a position to undertake, if they so wished, though far fewer would be likely to undertake with a degree of success that makes them go down in history. What seems clear is that creativity is associated with learning and with effort, and that we cannot say that people considered as creative "have had no choice but be so", because they were programmed that way.

Thirdly, by exercising our capacities for lateral thinking, that which follows the logic of desire rather than focusing on the viable, the operative, the possible, etc. Before thinking in such terms it is useful to think of as many different ideas as we can: impossible ideas, improbable ideas, unjudged ideas; this tends to open up an unpredictable world of possibilities (De Bono, 1992; Osborn, 1963). Simonton, in a study with 2036 creative scientists, discovered that the most creative ones not only produced a larger quantity of great works, but also a larger number of poor works (Simonton, 1984). In other words, they produced a lot and selected the best.

And fourthly, by relativizing the importance of others' judgements. The judgement of others may be important with regard to going down in history, but for living day-to-day without added pressures and without superfluous restrictions, not so much. To create requires some degree of freedom, at least initially, and if we are constantly pre-occupied with what others might think, it will be difficult to set challenges, propose alternatives, investigate possibilities, and so on.

The main obstacle to developing creativity is the belief that we cannot develop it, and there are too many people who consider themselves incapable of doing something creative in any field of activity. What probably occurs is that they confuse initial failure with basic inability, and consider that the first attempt or performance is

the measure of true talent (Buzan, 2003). They forget that the great geniuses are remembered not for their early work or for their poorer work, but rather for the heights they attained with some of their ideas.

REFERENCES

- Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology*, 43, 997-1013.
- Amabile, T. M. (1983). The Social Psychology of Creativity: A Componential Conceptualization. *Journal of Personality and Social Psychology*, 45(2), 357-376.
- Amabile, T. M. (1985). Motivation and creativity: Effects of motivational orientation creative writers. *Journal of Personality and Social Psychology*, 48(2), 393-399.
- Amabile, T. M. (1993). What Does a Theory of Creativity Require? *Psychological Inquiry*, 4(2), 179-181.
- Amabile, T. M., De Jong, W. & Lepper, M. (1976). Effects of externally imposed deadlines on subsequent intrinsic motivation. *Journal of Personality and Social Psychology*, 34, 92-98.
- Barron, F. (1955). The disposition toward originality. *Journal of Abnormal and Social Psychology*, 51, 478-485.
- Barron, F. & Harrington, D. M. (1981). Creativity, intelligence and personality. *Annual Review of Psychology*, 32, 439-476.
- Besemer, S. P. & Treffinger, D. J. (1981). Analysis of creative products: review and synthesis. *Journal of Creative Behavior*, 15(3), 158-178.
- Boden, M. (1991). *The creative mind: Myths and mechanisms*. New York: Basic Books.
- Bowers, K. S., Farvolden, P. & Mermigis, L. (1995). Intuitive antecedents of insight. In S. M. Smith, T. B. Ward & R. A. Finke (Eds.), *The creative cognition approach*. (pp. 27-51). Cambridge, MA: MIT Press.
- Bruner, J. (1962). The conditions of creativity. In H. Gruber, G. Terrell & M. Wertheimer (Eds.), *Contemporary approaches to creative thinking*. New York: Atherton Press.
- Buzan, T. (2003). *El poder de la inteligencia creativa*. Barcelona: Urano.
- Cassandro, V. & Simonton, D. K. (2002). Creativity and Genius. In C. L. Keyes & J. Haidt (Eds.), *Flourishing. Positive psychology and the life well-lived* (pp. 163-183). Washington, DC: American Psychological Association.
- Cox, C. (1926). The early mental traits of three hundred



- geniuses. Stanford, C.A.: Stanford University Press.
- Csikszentmihalyi, M. (1996). *Creativity. Flow and the psychology of discovery and invention*. New York: HarperCollins Publishers.
- Dawkins, R. (1976). *The selfish gene*. New York: Oxford University Press.
- De Bono, E. (1971). *Lateral thinking for management*. New York: McGraw-Hill.
- De Bono, E. (1985). *Six thinking hats*. Boston: Little Brown.
- De Bono, E. (1992). *Serious creativity: Using the power of lateral thinking to create new ideas*. New York: Harper Collins.
- Edelman, G. M. (1987). *Neural Darwinism*. New York: Basic Books.
- Ericsson, K. A. (1996). *The road to expert performance: Empirical evidence from the arts and sciences, sports, and games*. Mahwah, NJ: Erlbaum.
- Eysenck, H. J. (1993). Creativity and personality: A theoretical perspective. *Psychological Inquiry*, 4, 147-178.
- Eysenck, H. J. (1995). *Genius. The natural history of creativity*. Cambridge: University Press.
- Finke, R. A. (1990). *Creative imagery: Discoveries and inventions in visualization*. Hillsdale, NJ: Erlbaum.
- Finke, R. A., Ward, T. B. & Smith, S. M. (1992). *Creative cognition: Theory, research, and applications*. Cambridge, MA: MIT Press.
- Galton, F. (1869). *Hereditary Genius: An inquiry into its laws and consequences*. London: Macmillan.
- Gardner, H. (1993). *Creating minds*. New York: Basic Books.
- Getzels, J. W. & Csikszentmihalyi, M. (1976). From problem solving to problem finding. In I. A. Taylor & J. W. Getzels (Eds.), *Perspectives in creativity*. Chicago: Aldine.
- Gordon, W. (1961). *Synectics. The development of creative capacity*. New York: HarperryRow.
- Guilford, J. P. (1950). Creativity. *American Psychologist*, 5, 444-454.
- Guilford, J. P. (1967). *The Nature of Human Intelligence*. New York: McGraw-Hill.
- Hayes, J. R. (1989). *The complete problem solver*. Hillsdale, NJ: Erlbaum.
- Johnson-Laird, P. N. (1988). Freedom and constraint in creativity. In R. J. Sternberg (Ed.), *The nature of creativity* (pp. 202-219). New York: Cambridge University Press.
- Kahneman, D. & Tversky, A. (1982). The psychology of preferences. *Scientific American*, 246(1), 160-173.
- Lubart, T. I. (1990). Creativity and cross-cultural variation. *International Journal of Psychology*, 25, 39-59.
- MacKinnon, D. W. (1965). Personality and the realization of creative potential. *American Psychologist*, 20, 273-281.
- MacKinnon, D. W. (1978). *In search of human effectiveness*. Buffalo, NY: Bearly.
- Marina, J. A. (1993). *Teoría de la inteligencia creadora*. Barcelona: Anagrama.
- Martindale, C. (1989). Personality, situation, and creativity. In J. A. Glover, R. R. Ronning & C. R. Reynolds (Eds.), *Handbook of creativity* (pp. 211-232). New York: Plenum Press.
- Martindale, C. (1990). Creative imagination and neural activity. In K. G. Kundendorf & A. A. Sheikh (Eds.), *The psychophysiology of mental imagery*. (pp. 89-108). Amityville, NY.: Baywood.
- McGuire, W. (1973). The yin and yang of progress in social psychology: Seven Koan. *Journal of Personality and Social Psychology*, 26, 446-456.
- Newell, A., Shaw, J. C. & Simon, H. A. (1958). Elements of a theory of human problem solving. *Psychological Review*, 65, 151-166.
- Newell, A., Shaw, J. C. & Simon, H. A. (1962). The processes of creative thinking. In H. Gruber, G. Terrell & M. Wertheimer (Eds.), *Contemporary approaches to creative thinking*. New York: Atherton Press.
- Nicholls, J. (1972). Creativity in the person who will never produce anything original and useful: the concept of creativity as a normally distributed trait. *American Psychologist*, 27, 517-527.
- Osborn, A. F. (1963). *Applied imagination: Principles and procedures of creative problem-solving*. New York: Scribner.
- Popper, K. R. (1956). *The foundations of scientific discovery*. New York: Basic Books.
- Rothenberg, A. (1990). *Creativity and madness: New findings and old stereotypes*. Baltimore: Johns Hopkins University Press.
- Runco, M. A. (1991). The evaluative, valuative, and divergent thinking of children. *Journal of Creative Behavior*, 25, 311-319.
- Simonton, D. K. (1975a). Biographical determinants of achieved eminence: A multivariate approach to the Cox data. *Journal of Personality and Social Psychology*, 33, 218-226.
- Simonton, D. K. (1975b). Sociocultural context of indi-

- vidual creativity: A transhistorical time-series analysis. *Journal of Personality and Social Psychology*, 32, 1119-1133.
- Simonton, D. K. (1984). *Genius, creativity, and leadership: Historiometric inquiries*. Cambridge, MA.: Harvard University Press.
- Simonton, D. K. (1991). Emergence and realization of genius: The lives and works of 120 classical composers. *Journal of Personality and Social Psychology*, 61, 829-840.
- Simonton, D. K. (1998). Achieved eminence in minority and majority cultures: Convergence versus divergence in the assessments of 294 African Americans. *Journal of Personality and Social Psychology*, 74, 804-817.
- Simonton, D. K. (1999). Creativity and genius. In L. Pervin & O. John (Eds.), *Handbook of personality theory and research*. (pp. 629-652). New York: Guilford Press.
- Simonton, D. K. (2000). Cognitive, Personal, Developmental, and Social Aspects. *American Psychologist*, 1, 151-158.
- Smith, S. M., Ward, T. B. & Finke, R. A. (1995). *The creative cognition approach*. Cambridge, MA: MIT Press.
- Stein, M. (1974). *Stimulating creativity*. (Vol. 1). New York: Academic Press.
- Stein, M. (1975). *Stimulating creativity*. (Vol. 2). New York: Academic Press.
- Stein, M. I. (1969). Creativity. In E. F. Borgatta & W. W. Lambert (Eds.), *Handbook of personality theory and research*. (pp. 900-942). Chicago: Rand-McNally.
- Sternberg, R. J. (1985). Implicit theories of intelligence, creativity, and wisdom. *Journal of Personality and Social Psychology*, 49, 607-627.
- Sternberg, R. J. (1988). *The nature of creativity*. Cambridge: University Press.
- Sternberg, R. J. (1990). *Más allá del cociente intelectual*. Bilbao: Desclee de Brouwer.
- Sternberg, R. J. (1996). Investing in creativity. *American Psychologist*, 51(7), 677-688.
- Sternberg, R. J. & Lubart, T. I. (1995). *Defying the Crowd. Cultivating Creativity in a Culture of Conformity*. New York: The Free Press.
- Torrance, E. (1988). The nature of creativity as manifest in its testing. In R. J. Sternberg (Ed.), *The nature of creativity: contemporary psychological perspectives* (pp. 99-121). New York: Cambridge University Press.
- Ward, T., Smith, S. M. & Finke, R. A. (1999). Creative cognition. In R. J. Sternberg (Ed.), *Handbook of Creativity*. Cambridge: Cambridge University Press.
- Ward, T. B., Smith, S. M. & Vaid, J. (1997). *Creative thought: An investigation of conceptual structures and processes*. Washington, DC: American Psychological Association.
- Weisberg, R. W. (1993). *Creativity: Beyond the myth of genius*. New York: Freeman.