

Title:

Perspectives on the Social Psychology of Creativity

Authors:

Teresa M. Amabile, tamabile@hbs.edu

Julianna Pillemer, jpillemer@hbs.edu

Harvard Business School

Soldiers Field Road

Boston, MA 01778

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Abstract

Scholars began serious study into the social psychology of creativity about 25 years after the field of creativity research had taken root. Over the past 35 years, examination of social and environment influences on creativity has become increasingly vigorous, with broad implications for the psychology of human performance, and with applications to education, business, and beyond. In this article, we revisit the origins of the social psychology of creativity, trace its arc, and suggest directions for its future.

Many laypersons still view creativity as purely a product of individual talents and traits. For a long while, most creativity researchers seemed to hold the same view. Even though J. P. Guilford's landmark address to the American Psychological Association in 1950 (Guilford, 1950) exhorted researchers to seriously dig into creativity as a cognitive and social process as well as a personality trait, the field stayed rather narrow for many years. In the 1950s, 1960s, and early 1970s, the predominant impression that a reader of the literature would glean was something like this: creativity is a quality of the person; most people lack that quality; people who possess the quality – geniuses – are different from everyone else, in talent and personality; we must identify, nurture, appreciate, and protect the creatives among us – but, aside from that, there isn't much we can do.

That, at least, is the impression that the first author of this paper, Teresa Amabile, formed when, in her Stanford psychology graduate program in the mid-1970s, she explored the literature out of a long-standing curiosity about creativity. The most prominent creativity research of the time involved deep psychological study of widely-recognized creators in fields such as architecture, mathematics, and creative writing, comparing them to less-accomplished peers. These landmark studies by Donald MacKinnon, Frank Barron, and their colleagues at the Institute for Personality Assessment and Research at Berkeley were fascinating (e.g., Barron, 1961; MacKinnon, 1965). They identified some clear differences in backgrounds, abilities, and – especially – personalities between the more- and the less-creative groups.

Another giant in the field, E. Paul Torrance, had been busy putting these insights to practical use. By the early 1960s, the field seemed to converge around a definition of creativity as the production of novel, appropriate ideas or works. Leveraging this solid

conceptualization, and the growing body of work on the psychological assessment of human potential and performance, Torrance created the Torrance Tests of Creative Thinking (TTCT) (Torrance 1966). With that work, he unleashed a torrent of instruments devised by other researchers to detect various aspects of creative ability, creative personality, or both. Although many of these, along with Guilford's own tests of creative ability (Guilford, 1963), gained considerable currency among researchers (e.g., Speller & Schumacher, 1975, Manske & Davis, 1968)), the TTCT remained (and, for many, remains) the standard-bearer for researchers and educators.

This work, in total, served to reinforce the impression – and, indeed, the *belief* among laypersons and scholars – that creativity depends on special qualities of unusual persons.

But couldn't there be more to the story than this? Five hints whispered that there was.

First, a broader reading of the creativity literature, to include not only scholarly writing but also the autobiographies and journals of well-known creative professionals in a number of fields, suggested that even “geniuses” had good days and bad days. That is, their production of novel, appropriate work ebbed and flowed – often as a function, it seemed, of pressures, constraints, and other events impinging on them from their social environment. Albert Einstein, for example, felt so overwhelmed by the strict examination period at his militaristic boarding school that he almost lost interest in science altogether. It wasn't until he fortuitously failed an exam and subsequently enrolled in an academy emphasizing individual thought that his creativity truly began to flourish. Others, such as the writers Sylvia Plath and Thomas Wolfe, were plagued by the desire for public esteem;

despite early successes, they were never truly able to free themselves from the fear of not living up to these external expectations.

Second, the motivation to do creative work, which can surely shift from day to day and even moment to moment, appeared to be a factor in the fluctuating performance of even widely-recognized creative individuals. Poet Anne Sexton demonstrated a generally consistent drive to write simply because she loved doing so. However, there were times in her life when the promise of fame or money, urging from mentors to create good work, or family obligations, threatened to hamper her ability to perform at her best .

Third, there were other currents in the early creativity literature suggesting that creativity was not a fixed, trait-like quality of individuals but, rather, a skill that might be taught, learned, practiced, and improved. In fact, several training programs emerged in the 1950s and 1960s, claiming to enhance the creativity of enrolled teams and individuals. The concept of brainstorming, a method for improving group problem solving, was first introduced in an advertising firm by Alex Osborn. Osborn asserted that the generation of creative ideas by groups could be enhanced by following his four basic brainstorming rules -- the most important of which is *deferring judgment* (Osborn, 1963). Working with Osborn, researcher Sidney Parnes used the rules of brainstorming, as well as other techniques, to develop the Creative Problem Solving (CPS) training program; initial tests of the program were promising (Parnes, 1967).

Fourth, the psychologist Richard Crutchfield, who had studied conformity, began writing some provocative and compelling papers on situational forces that might influence both conformity and its near opposite, creativity (Crutchfield , 1955, 1962).

Fifth, an intriguing paper by social psychologist Arie Kruglanski and his colleagues had appeared in 1971 (Kruglanski, Friedman, & Zeevi, 1971). Although, ironically, this paper was published in the *Journal of Personality*, it reported a randomized-control experiment showing that a manipulated social-environmental factor could cause differences in creative behavior. The specific factor manipulated in this study was a desirable external reward for participation, offered to participants in the experimental condition. The contracted-for reward lowered both creative output and participants' enjoyment of the task itself. This experiment dovetailed with – and expanded beyond – research that Amabile's graduate advisor, Mark Lepper, had been doing on the undermining of children's intrinsic interest by extrinsic reward (Lepper, Greene, & Nisbett, 1973).

Intrigued by the confluence of these five information streams, Amabile announced to her advisors that she planned to create a social psychology of creativity. (They responded somewhat warily, but agreed to indulge the impulse – at least for the dissertation.) Unbeknownst to Amabile and her advisors, Dean Keith Simonton, another social-psychologist-in-training many miles away (Harvard, that east-coast Stanford), had the same idea. For the next several years, with each other's encouragement (after having discovered each other's first published papers on creativity), Amabile and Simonton used very different methods and very different levels of analysis to build the foundation for what has become a cottage industry.

Simonton used archival data on great creators in history and sophisticated statistical methods (historiometry) to determine how various social, cultural, and political factors affect creative success (fame, eminence, originality, and productivity).

Simonton's subjects ranged from classical composers to scientific giants in history, as well as creative products like musical themes (e.g., Simonton, 1975; 1980). Some of his work investigated trends over multiple generations. In essence, Simonton developed a macro-level social psychology of creativity by examining broad social influences on well-known creative individuals in history. This work culminated in a "Darwinian" theory of creativity (Simonton, 1999). By contrast, Amabile focused on the immediate, micro-level: How differences in the social environment surrounding task engagement might alter the creative behavior of ordinary people. The remainder of this paper traces the trajectory of scholars' work on the micro-level social psychology of creativity, and plants some signposts to its possible future.

Enablers of Social-Psychological Research in Creativity: Experiments and Consensual Assessment

Before advances in the field by Simonton and Amabile, existing approaches to measurement fell short of an acceptable assessment for social psychological research. Most creativity assessment was done through pencil and paper tests. Personality tests, biographical inventories, and even the more widely-used behavioral measures such as the TTCT, were useful in assessing individual differences on very specific items. But, for precisely this reason, they were problematic for use in experiments which sought to *minimize* within-group variability to uncover socio-environmental influences on creativity.

Some early studies obtained expert ratings of products or people on creativity. Although marking an important movement away from pencil and paper tests, this method

typically lacked a clear operational definition of creativity and a rigorous set of procedures to avoid rater biases. Simonton addressed the measurement problem by constructing variables from existing records, such as word-counts of biographical dictionary entries for individuals in various fields, to estimate expert subjective assessments of the work of various creators, both living and (mostly) dead.

Drawing from the strengths and attempting to address the shortcomings of existing methods, Amabile (1982) developed the Consensual Assessment Technique (CAT) for use in experiments examining social and environmental effects on creativity. The CAT is rooted in a consensual operational definition of creativity: a product is creative to the extent that expert raters independently agree upon this judgment. An appropriate task for the use of the CAT must be sufficiently open-ended to allow for novel creations, must not depend to a great degree on special skills for which there is wide variation in the target population, and must result in a readily judged product or response. Judges should be external observers with experience in the target domain, and should use their own subjective judgments of creativity to independently rate the products relative to one another. Acceptable inter-judge reliability is considered to be .70 or higher.

Because it relies on subjective assessment (as does real-world creativity), the CAT overcomes the difficulty of defining ultimate “objective” criteria for creativity. The technique has been used reliably in a variety of between-subjects experimental designs across multiple ages and skill levels, with a variety of tasks from domains that include art, writing, musical composition, and various forms of problem-solving. Over the past 30

years, the CAT has been employed in hundreds of laboratory and field experiments that, cumulatively, have advanced the social psychology of creativity to a considerable extent.

In the past 15 years, the scope of the CAT has broadened. Baer, Kaufman and Gentile (2004) found an extremely high level of interrater agreement on the creativity of a wide range of writing products (teenagers' essays, poems, and stories) completed *outside* of a formal experimental setting, thus suggesting possible use in an educational setting. Hennessey & Kim (2008) found high reliability among raters of children's art and stories in the U.S., South Korea, Saudi Arabia, and China, suggesting that the CAT is an applicable and valuable tool for multi-cultural studies of creativity. In another non-experimental application, Amabile and colleagues (1996) used expert within-company raters to assess the creativity of the work done by a large number of project teams in a high-tech firm. Thus, the CAT has emerged as a widely applicable method for assessing creativity in research carried out by social, educational, and organizational psychologists.

The Intrinsic Motivation Principle of Creativity

The cornerstone for the micro-level social psychology of creativity was the Intrinsic Motivation Hypothesis of Creativity. Articulated by Amabile in 1983 (Amabile 1983a), the Intrinsic Motivation Hypothesis of Creativity proposed that "The intrinsically motivated state is conducive to creativity, whereas the extrinsically motivated state is detrimental." Intrinsic motivation arises from the individual's perceived value of engaging in the task itself (e.g., finding it interesting, enjoyable, satisfying, or positively challenging), while extrinsic motivation comes from outside sources (e.g., the promise of rewards or praise, or the threat of failing to meet a deadline or receiving a negative evaluation). In short, extrinsic motivators and extrinsic constraints in the social

environment could alter motivational state from intrinsic to extrinsic and, thus, undermine creative behavior.

In the first experiment to establish the negative effect of expected evaluation on creativity, Amabile (1979) had university students create a paper collage under one of several different expected-evaluation conditions; comparison groups did not expect evaluation. In general, compared to collages created by participants not expecting expert evaluation, judge-rated creativity was lower for those collages created by participants who expected evaluation by art experts – evaluations that would purportedly be shown to the participants. The only exception to this pattern was the group of participants who expected evaluation *on creativity* and were given *specific hints* on how to make a creative collage. Moreover, intrinsic interest in the collage activity was lowered by expected evaluation – even for participants in the specific-creativity-hints condition.

Further research replicated and expanded these findings. For example, two studies by Amabile, Goldfarb and Brackfield (1990) again showed negative effects of expected evaluation on adults' artistic creativity, and revealed a marginally significant effect of surveillance (participants believing they were being watched while working). In addition, post-task self-report measures indicated that surveillance had a negative effect on creativity to the extent that participants felt evaluated by those watching.

Shalley and Perry-Smith (2002) added considerable nuance to our understanding of the link between intrinsic motivation and creativity, in their own study of expected evaluation. In a laboratory experiment, they drew on Cognitive Evaluation Theory (Deci & Ryan, 1985) to examine differences between informational evaluation (evaluation that participants expect will give them useful performance information) and controlling

evaluation (evaluation that participants see as solely intended to monitor their behavior). Both intrinsic motivation and creativity were significantly higher in the informational than the controlling evaluation condition. This study, and others (e.g., Amabile, Hennessey, & Grossman, 1986), make clear that the specific form and presentation of extrinsic motivators can dramatically affect the impact of social-environmental influences such as evaluation and reward on intrinsic motivation and creativity.

Amabile (1996a) eventually revised the terminology, from the Intrinsic Motivation Hypothesis to the Intrinsic Motivation Principle of Creativity, due to a growing body of empirical support indicating that intrinsic motivation is indeed a crucial determinant of creativity across multiple populations and contexts. Despite new evidence that extrinsic motivation can sometimes combine synergistically with intrinsic motivation in supporting creativity (Amabile, 1993), and despite some challenges to the role of intrinsic motivation in creativity (e.g., Eisenberger & Cameron, 1996), the weight of empirical evidence from a variety of domains confirms the importance of intrinsic motivation to creativity.

Over the past 15 years, research into the effects of social-environmental factors on intrinsic motivation and creativity has expanded beyond the laboratory, and has occasionally included aspects of personality as well. Much of this work has focused on creativity in organizational settings. For example, Zhou (2003) integrated theories on intrinsic motivation and observational learning to examine how creative models and supervisory behavior influence employee creativity. She focused primarily on two supervisor behaviors: close monitoring (hypothesized to decrease intrinsic motivation and, thus, creativity) and developmental feedback (hypothesized to increase intrinsic

motivation and creativity). In addition, Zhou examined the effects of having creative coworkers (models). Using survey data in a field setting, Zhou found that creative personality moderates the relationship between supervisory behavior, the presence of creative co-workers, and creativity. Participants with less creative personalities exhibited higher levels of creativity under low close monitoring and the presence of creative coworkers. These social-environmental factors had less impact on participants with higher scores on the creative personality scale.

Other scholars have looked at variables moderating the intrinsic motivation-creativity relationship. For example, Grant and Barry (2011) discovered that perspective-taking moderates the relationship between intrinsic motivation and creativity in organizations. These authors suggest that intrinsic motivation may focus the mind on the “novel” aspects of creativity, which are particularly important in activities such as creating artwork, but may not relate as closely to the “usefulness” aspect of creativity, which, for example, is highly important in business. Using data from two field studies and one lab study, Grant and Barry found that *other-focused* psychological processes – prosocial motivation and perspective-taking – strengthen the relationship between intrinsic motivation and creativity in organizational settings.

Other organizational creativity research has examined the effects of the social environment along with constructs that are *related* to intrinsic motivation, as well as how the motivation-creativity relationship might unfold in different cultural settings. Liu, Chen, and Yao (2011) extend beyond the research linking intrinsic motivation and creativity, to examine how “harmonious passion” interacts with autonomy to influence creativity. The authors define harmonious passion as “the autonomous internalization of

an activity, making it part of one's identity and thus creating a sense of personal enjoyment and free choice about pursuing the activity." They cite previous research on self-determination theory and intrinsic/extrinsic motivation in constructing their hypothesis that harmonious passion moderates the effects of both external support for autonomy at one's organization and individual autonomy on creativity. These researchers assert that harmonious passion is a stronger motivator than simple intrinsic motivation, because those possessing it internalize the activity as part of their identity; essentially, harmonious passion is a strong and stable form of intrinsic motivation. The study assessed the autonomy orientation of each individual, autonomy support at the team level and unit level, harmonious passion, and creativity (team-leader rated), using survey measures administered to members of two firms in China. The main finding was that harmonious passion moderated the relationship between creativity and three levels of autonomy—individual, team, and organizational. Moreover, harmonious passion was a stronger factor than both intrinsic and extrinsic motivation in predicting creativity.

Very recently, the Intrinsic Motivation Principle of Creativity has gained considerable currency among laypersons. This is largely due to Daniel Pink's bestselling 2010 book *Drive*, which engagingly describes and explains the positive effects of intrinsic motivation (and the negative effects of extrinsic motivation) on many aspects of human performance, including creativity. Pink dubs managers, educators, and others who believe in the superiority of intrinsic motivation as "Type I's," and those who rely on extrinsic motivators as "Type X's." Pink proposes that an understanding of the power of intrinsic motivation is important not only for promoting creativity, but also for avoiding catastrophe. He asserts that much of the recent worldwide financial disaster, and many of

the problems with organizations today, can be traced to a focus on short-term goals in the form of external rewards. Pink points out that, as psychologists had discovered years earlier, human needs go far beyond basic drives of survival, seeking rewards, and avoiding punishment. In one of his more memorable phrases, Pink notes that humans are not horses; we seek interesting things that give our life meaning.

The Componential Theory of Creativity: Social-Environmental Forces in Context

Social-environmental influences can significantly influence creativity but, clearly, they are but one determining force. Prior to and simultaneous with the development of the social psychology of creativity, psychologists from a number of sub-disciplines have theorized about how creativity happens and what influences it. Attempting to avoid theoretical fragmentation, Amabile (1983a, 1983b; 1996a) proposed a comprehensive theory of creativity that integrated conceptualizations of intrinsic motivation and the social environment with the cognitive and personality constructs that earlier theorists had emphasized.

The componential theory includes three intra-individual components that influence creativity, and one external component – the social environment. The intra-individual components are (1) domain-relevant skills (expertise, technical skill, and innate talent in the relevant domain(s) of endeavor); (2) creativity-relevant skills, later renamed “creativity-relevant processes” (flexible cognitive style, personality traits such as openness to experience, skill in using creative-thinking heuristics, and persistent work style), and (3) intrinsic task motivation. According to the theory, these components combine in a multiplicative fashion; none can be completely absent, if some level of creativity is to result.

The external component, the social environment, can influence each of the intra-individual components. Domain-relevant and creativity-relevant skills can be affected by training, modeling, and experience afforded by the social environment. However, the most immediate and prevalent influence of the environment is exerted on the motivational component, as evidenced by empirical research on the Intrinsic Motivation Principle of Creativity.

Building on earlier models of the creative process, the componential theory specifies the component(s) that are likely to most strongly influence each stage of the process by which novel, appropriate ideas are produced. (Like most creativity-stage theories, the componential theory acknowledges that a stage-like sequence is a convenient artifice, with real creative problem-solving being much messier.) The first stage, initially called “problem or task presentation” (re-dubbed “problem or task identification” in the 1996 revision of the theory) is the point at which the person becomes aware that there is an opportunity or a need to solve a problem or undertake a new task. Here, task motivation plays a prominent role, because it determines whether and how the person will choose to engage with the problem at hand. In the second stage, “preparation,” domain-relevant skills play an important role as the person gathers information (and possibly learns new skills) in order to undertake the task. Creativity-relevant skills and task motivation largely determine the outcome of the third stage, “response generation” during which candidate solutions or response possibilities are produced. In the fourth stage, “response validation,” the person relies on domain-relevant skills to evaluate the novelty and usefulness of the candidate responses. In the fifth and final stage, “outcome,” the response is communicated and the outcome of the process is

evaluated. If the result is complete success (a novel and useful solution that is accepted by others) or total failure (no progress towards a solution), the process ends. If there is some progress toward the final goal, the person likely returns to the first stage and takes another stab at it.

The componential theory has been tested and enlarged in a wide range of psychological studies over the past 25 years. One of the most interesting developments concerns the discovery of team-level (and perhaps organization-level) creativity-relevant processes, to add to the individual-level creativity-relevant processes in the original theory. For example, Taggar (2002) examined how personality traits and team processes impact the creativity of small groups on an open-ended set of tasks. Results supported and expanded upon parts of the componential model. Not only did individual differences relate in predicted ways to creative output, but there was also evidence of “team creativity-relevant processes”: a group’s ability to work together effectively and make the most of each member’s skill set. These creativity-relevant processes moderated the relationship between individual creativity and group creative output.

Hirst, van Knippenberg, and Zhou (2009) also investigated a team-level construct but, although Tagger (2002) studied team creativity-relevant processes, these authors examined the team context as an aspect of the external social environment. Building on the componential theory, Hirst and colleagues proposed and found that the team context can enhance individual creativity by fostering individual learning. This study predicted employee creativity from learning orientation (an individual-level construct related to both intrinsic motivation and the acquisition of domain-relevant and creativity-relevant skills) and team learning behavior (the extent to which the individual’s team engages in

collective problem-solving and reflection). Utilizing survey data from R&D teams across several companies in three different countries, the authors found that an individual's learning orientation – the person's preference for challenging activities that develop new skills and afford creativity – positively predicts individual creativity. The study also uncovered an intriguing non-linear interaction between individual orientations and team learning context. This research not only builds our understanding of the individual creativity components, but it also highlights team context as a key social-environmental variable. Clearly, the research by Tagger (2002) and Hirst, van Knippenberg, and Zhou (2009), as well as others, suggests extending Amabile's componential theory to include group processes.

Other theorists have built from the componential theory to create their own related theories of creativity. In their "investment theory of creativity" Sternberg and Lubert (1991) propose that creativity is a result of the extent to which six resources (intellectual processes, knowledge, intellectual style, personality, motivation, and environmental context) are combined and utilized. Woodman, Sawyer and Griffin (1993) propose a theory of creativity that builds upon the interaction between person and social environment to form an "interactional framework for organizational creativity." Their theory explores how person, process, product and situation interact to incite innovation at the individual and organizational level, this relating to but also expanding upon the componential theory.

The 1996 revision of the componential theory in Amabile's *Creativity in Context* contains a few alterations of nomenclature and a revision of the graphical presentation to prominently depict the social-environment component. In more recent research, Amabile

and colleagues (Amabile, Barsade, Mueller & Staw, 2005) propose that *affect* – both affective state and trait affectivity – be added to the theory. Because affect is a psychological process that is particularly relevant to creative thinking, and because it is distinct from intrinsic motivation, it should be considered as an additional element of the creativity-relevant processes component. Moreover, because Weiss and Cropanzano's Affective Events Theory (1996) and Amabile's subsequent research (Amabile & Kramer, 2011) highlight the impact of events in the work environment on affective state, affect joins the list of creativity-relevant process elements that can be significantly influenced by the social environment.

In the years since the componential theory of creativity was first published, its impact on the field has been evidenced both through direct citations of the theory by empirical and theoretical scholars and through a growing recognition of the central role that social-environmental forces play in creativity. Amabile's own creativity research has become both more macroscopic, examining organizational dynamics that can influence the creative productivity of individuals and project teams, and more microscopic, identifying specific events in individuals' daily work experience that can influence perceptions of the work environment, affect, intrinsic motivation, and – as a consequence – creativity (see Amabile & Kramer, 2011).

The Present as a Window to the Future

Recent trends in creativity research reveal that researchers from many disciplines are keenly interested in creativity and, in particular, the social-environmental forces that can influence creativity. This burgeoning interest is giving rise to some interesting cross-disciplinary collaborations. For example, organizational behavior scholars have paired

with social psychologists to examine the conditions under which work teams might perform more creatively. In a fascinating study of previously-unacquainted, diverse teams working together on similar projects over several months, one such group of researchers found that what happens in the first few minutes of a team's life can profoundly affect creativity on team projects (Polzer, Milton, & Swann, 2002). Specifically, if the members of the team become acquainted by sharing their views of themselves during their initial meeting – through a process termed *interpersonal congruence* – the team is likely to receive higher creativity scores on its projects.

Another recent study combined social and cognitive psychology, by presenting participants with information about how other persons had presumably assessed a product. Some participants were primed with paradoxical frames, or “mental templates individuals use to embrace seemingly contradictory statements or dimensions of a task or situation.” Specifically, all participants were given a prototype of a toy, and were told that it was praised for either its high creativity (creative frame), its low production cost (efficiency frame), or both (paradoxical frame). Creative performance on an unrelated task was highest for those in the paradoxical frame condition, presumably because their complex thinking had been enhanced. In a follow-up study, participants who were primed by thinking of paradoxical statements (versus merely interesting ones) also performed more creatively (Miron-Spektor, Gino, & Argote, 2011).

In other cross-disciplinary pairings, economists have begun collaborating with psychologists. In one recent paper (Gino & Ariely, in press), a series of five lab studies found that “moral flexibility” increases with both dispositional and situational creativity. In the basic paradigm, following initial assessments of dispositional creativity, some

participants were primed to think creativity; all then completed a series of tasks in which they had the opportunity to cheat in reporting their results. Whether people were more creative dispositionally or as a result of being primed toward flexible thinking, they were more likely to be dishonest in their responses. Results suggested that creativity promotes the ability to justify one's behavior to oneself and, thus, increases the probability of engaging in dishonest behavior – at least in certain situations.

The explosion of interest in creativity among scholars in a variety of fields, although encouraging, has a downside: the fragmentation of research into sub-fields (see Hennessey & Amabile, 2010). The cross-disciplinary collaborations just described represent only a small subset of current creativity research. Many new discoveries about creativity are being made each year within particular disciplines, but few of those discoveries exert an influence on the wider community of creativity scholarship. For example, neuroscience has revealed that semantic activation of the right hemisphere can lead to “aha” moments of insight (Bowden and Jung-Beeman, 1998). Participants attempted to solve a series of word problems, and after each were presented with a solution or non-solution word, in either the left vision field (right hemisphere) or right vision field (left hemisphere) which they had to quickly read aloud. Results indicated that solutions to unsolved problems were more quickly read only when presented to the *right hemisphere*, thus indicating activation that could lead to later insight.

Although problem-solving has also been studied by educational psychologists, using a cross-cultural lens (e.g., Ng, 2003, 2005; Zha et al., 2006), there is little evidence that the problem-solving insights of the neuroscientists have been combined in a meaningful way with the problem-solving insights of the educational psychologists.

We cannot say where the social psychology of creativity *will* go in the next decade or two, but we can suggest where it *should* go. It should move toward a comprehensive view of individual creative behavior in social context, with insights ranging from the neuropsychological responses elicited by social stimuli, to the dynamics of teams solving problems at a distance, to the cultural influences that can shape the production of new and useful ideas in any domain. We have learned much, but the most interesting revelations surely lie ahead.

References

- Amabile, T. M. (1979). Effects of external evaluation on creativity. *Journal of Personality and Social Psychology*, 37, 221-233.
- Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology*, 43, 997-1013.
- Amabile, T. M. (1983a). *The social psychology of creativity*. New York: Springer-Verlag.
- Amabile, T. M. (1983b). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, 45, 357-376.
- Amabile, T. M. (1996a). *Creativity in context*. Boulder, CO: Westview.
- Amabile, T. M. (1996b). Assessing the work environment for creativity. *Academy Of Management Journal*, 39(5), 1154-1184.
- Amabile, T.M., Barsade, S.G., Mueller, J.S., & Staw, B.M. (2005). Affect and creativity at work. *Administrative Science Quarterly*, 50(3), 367–403.
- Amabile, T.M., Goldfarb, P., & Brackfield, S.C. (1990). Social influences on creativity: evaluation, coaction, and surveillance. *Creativity Research Journal*, 3, 6-21.
- Amabile, T. M., Hennessey, B. A., & Grossman, B. S. (1986). Social influences on creativity: The effects of contracted-for reward. *Journal of Personality and Social Psychology*, 50, 14-23.
- Amabile, T.M. & Kramer, S. (2011). *The Progress Principle: Using small wins to ignite joy, engagement, and creativity at work*. Boston, MA: Harvard Business Review Press.
- Baer J., Kaufman J.C., & Gentile C.A. (2004). Extension of the Consensual Assessment Technique to Nonparallel Creative Products. *Creative Research Journal*, 16 (1). 113-117.
- Barron, F. (1961). Creative vision and expression in writing and painting. In *Conference on the creative person*. Berkeley: University of California, Institute of Personality Assessment and Research.
- Bowden E.M. & Jung-Beeman M. (1998). Getting the right idea: semantic activation in the right hemisphere may help solve insight problems. *Psychological Science*, 9, 435–40.

- Crutchfield, R.S. (1955). Conformity and character. *American Psychologist*, *10*, 191-198.
- Crutchfield, R. (1962). Conformity and creative thinking. In H. Gruber, G. Terell, & M. Wertheimer (Eds.), *Contemporary approaches to creative thinking*. New York: Atherton Press.
- Deci, E. L. & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Eisenberger, R., & Cameron, J. (1996). Detrimental effects of reward: Reality or myth? *American Psychologist*, *51*, 1153-1166.
- Gino, F., & Ariely, D. (2012). The dark side of creativity: original thinkers can be more dishonest. *Journal of Personality and Social Psychology*. Forthcoming.
- Grant, A. M., & Berry, J. W. (2011). The Necessity of Others is the Mother of Invention: Intrinsic and Prosocial Motivations, Perspective Taking, and Creativity. *Academy of Management Journal*, *54*(1), 73-96.
- Guilford, J.P. Creativity. *American Psychologist*, 1950, *5*, 444-454.
- Guilford, J.P. (1960) Intellectual resources and their values as seen by scientists. In C.W.
- Taylor, C. & Barron, F. (1963). *Scientific creativity: Its recognition and development*. New York: Wiley.
- Hennessey, K., & Kim, G. (2008). A Multi-cultural Application of the Consensual Assessment Technique. *The International Journal of Creativity & Problem Solving*, *18*(2): 87-100.
- Hirst, G. (2009). A cross-level perspective on employee creativity: goal orientation, team learning behavior, and individual creativity. *Academy Of Management Journal*, *52*(2), 280-293.
- Kruglanski, A. W., Friedman, I. and Zeevi, G. (1971), The effects of extrinsic incentive on some qualitative aspects of task performance. *Journal of Personality*, *39*, 606-617.
- Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal Of Personality And Social Psychology*, *28*(1), 129-137.
- Liu, D., Chen, X., & Yao, X. (2011). From autonomy to creativity: A multilevel investigation of the mediating role of harmonious passion. *Journal of Applied Psychology*, *96*(2), 294-309

- MacKinnon, D.W. Personality and the realization of creative potential. *American Psychologist*, 1965, 20, 273-281.
- Manske, M.E., & Davis, G.A. (1968). Effects of simple instructional biases upon performance in the unusual uses test. *Journal of General Psychology*, 79, 25-33.
- Miron-Spektor, E., Gino, F., & Argote, L. (2011). Paradoxical frames and creative sparks: Enhancing individual creativity through conflict and integration. *Organizational Behavior and Human Decision Processes*, 116(2), 229-240.
- Ng A. K. (2003). A cultural model of creative and conforming behavior. *Creativity Research Journal*, 15, 223-33.
- Ng A. K. (2005). Creativity, learning goal and self-construal: A cross-cultural investigation. *Korean Journal of Thinking & Problem Solving*, 15, 65-80.
- Osborn, A. (1963). *Applied imagination: Principles and procedures of creative thinking*. New York: Scribner's.
- Parnes, S. (1967). *Creative Behavior Guidebook*. New York: Scribner's.
- Pink, D. (2009) *Drive: The Surprising Truth About What Motivates Us*. New York, NY: Riverhead Books.
- Polzer J., Milton L.P., Swann B. (2002). Capitalizing on diversity: interpersonal congruence in small work groups. *Administrative Science Quarterly*, 47, 296-324
- Torrance, E.P. (1966) *The Torrance tests of creative thinking: Norms-technical manual* . Lexington, Mass.: Personnel Press.
- Shalley, C. E., & Perry-Smith, J. E. (2001). Effects of social-psychological factors on creative performance: The role of informational and controlling expected evaluation and modeling experience. *Organizational Behavior and Human Decision Processes*, 84, 1-22.
- Shalley, C., Gilson, L., & Blum, T. (2009). Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. *Academy Of Management Journal*, 52(3), 489-505.
- Simonton, D. K. (1975). Sociocultural context of individual creativity: A trans-historical time-series analysis. *Journal of Personality and Social Psychology*, 32, 1119-1133.
- Simonton, D.K. (1980). Thematic fame and melodic originality in classical music: a multivariate computer-content analysis. *Journal of Personality*, 48, 206-219.

- Simonton, D. K. (1999). *Origins of genius: Darwinian perspectives on creativity*. New York: Oxford University Press.
- Speller, K.G., & Schumacher, G.M. (1975). Age and set in creative test performance. *Psychological Reports*, 36, 447-450.
- Sternberg R., Lubart, T. (1991). An Investment Theory of Creativity and Its Development. *Human Development*, 34, 1-31
- Taggar, S. (2002). Individual creativity and group ability to utilize individual creative resources: A multilevel model. *Academy Of Management Journal*, 45(2), 315-330.
- Weiss, H. M., & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B. M. Staw & L. L. Cummings (Eds.), *Research in organization behavior* (Vol. 19, pp. 1-74). Greenwich, CT: JAI Press.
- Woodman, R. W. (1993). Toward a theory of organizational creativity. *Academy Of Management Review*, 18(2), 293-321
- Zha, P., Walczyk, J.J, Griffith-Ross, D.A., Tobacyk, J.J., & Walczyk, D.F., (2006). The impact of culture and individualism-collectivism on the creative potential and achievement of American and Chinese adults. *Creativity Research Journal*, 18, 355-66.
- Zhou, J. (2003). When the presence of creative coworkers is related to creativity: Role of supervisor close monitoring, developmental feedback, and creative personality. *Journal of Applied Psychology*, 88(3), 413-422.