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NOTE

UNPACKING CREATIVITY

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Creativity research has a long and illustrious history, yet the assumptions on which it is based have not been questioned. Most researchers assume that creativity is a unitary construct, hindering a fuller understanding of the phenomenon. Here I argue against homogeneity through the development of a matrix of four creativity types: responsive, expected, contributory, and proactive. Implications include highlighting an imbalance in research, differences in processes, and predictors for the various types, as well as newly considering methodologies.

Many researchers have suggested that creativity is as important for the long-term survival of organizations (e.g., Oldham & Cummings, 1996; Scott & Bruce, 1994) as it is in the scientific (Datta, 1963), artistic (Simonton, 1975), and developmental (Goodale, 1970) arenas. Yet, despite this recognized importance, little has been done to examine the assumptions underlying creativity. In this paper I question one of the premises of creativity research—namely, that creativity is a unitary construct.

Many strands of research have been woven into our knowledge of creativity. These perspectives range from Royce's discussion of inventions in 1898 to Guilford's call for creativity research in 1950; research into creativity in classrooms (e.g., Mayer & Sims, 1994) to research into creativity in organizations (e.g., Oldham & Cummings, 1996; Scott & Bruce, 1994); and Freudian accounts (e.g., Freud, 1908) to cognitive accounts (e.g., Mednick, 1962; Wallas, 1926), personality accounts (e.g., Barron & Harrington, 1981), sociological accounts (e.g., Stein, 1967), interactionist accounts (e.g., Woodman, Sawyer, & Griffin, 1993), and social psychological accounts (e.g., Amabile, 1996).[1] Throughout most of these perspectives, creativity usually has been defined as the production of novel ideas that are useful and appropriate to the situation (e.g., Amabile, 1983; Mumford & Gustafson, 1988).

This definition, however, implies a singular entity. Creativity is based upon novel and useful ideas, regardless of the type of idea, the reasons behind its production, or the starting point of the process. This belief in homogeneity hinders a finer-grained analysis of the processes and the factors involved in creativity. The importance of such conceptual distinctions pervade organizational research. For instance, voice citizenship behaviors are different from helping citizenship behaviors (Van Dyne, Cummings, & McLean Parks, 1995), and task-related conflict is different from socioemotional conflict (Jehn, 1995). In much the same way, creativity may also encompass types that are fundamentally different from each other.

Indeed, Sternberg (1999b) recently outlined a typology of creativity based upon the outcome of the creative process (e.g., forward incrementation or conceptual replication). Although this categorization is useful, it focuses upon the end product, leading to two problems. First, only ideas that reach the end of the process are studied, so the sample becomes biased toward more successful ideas. Second, the categorization encourages retrospective analysis of the process, which may lead to bias in recollection. To enable prospective analysis, we need to categorize creativity based upon an individual's initial engagement in creative activity.

Two questions underlie engagement in the creative process. First, why do people engage in

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[1] A full review of the creativity literature is beyond the scope of this paper. I refer interested readers to Mumford and Gustafson (1988) and Sternberg (1999a) as useful starting points.

creative activity? Second, what is the initial state of the trigger? The first question involves the drivers for idea generation, whereas the second involves the degree of problem finding needed at the starting point of the creative process. Therefore, I offer here a distinct contribution to the literature by forming a typology of creativity derived from an individual's engagement in the creative process. This classification will lead to a greater understanding of creativity—over and above the understanding gained from predictive models, such as those proposed by Woodman et al. (1993), Amabile (1996), and Ford (1996).

I present this typology in the following sections. First, I elaborate on the dimensions previously outlined: "Why?" (i.e., the driver behind the engagement) and "What?" (i.e., the degree of problem finding needed). Then, using examples from the workplace and the creativity literature, I illustrate the different types of creativity found within a matrix that juxtaposes these two dimensions. I also verify the matrix by comparing relationships between measures of the same and different types of creativity. Finally, I discuss the theoretical and methodological implications of the matrix.

DIMENSION ONE—DRIVER TYPE: WHY ENGAGE IN THE CREATIVE PROCESS?

Deci and Ryan (1987) argue that behaviors are initiated either through self-determined choice or because of external demands. Self-determined behaviors are those that are autonomous—that is, "people experience themselves as initiators of their own behavior" (Deci & Ryan, 1987: 1025). For example, a wish to be creative or a desire to achieve a goal state represents an internal driver for creativity. However, an individual may engage in a behavior because the situation requires that it be performed. Thus, job descriptions (such as that given to a research and development [R&D] scientist) or experimental requirements to write poems present external demands for creativity. This simple dichotomy represents a more complex continuum that ranges from internally driven engagement to externally driven engagement.

DIMENSION TWO—PROBLEM TYPE: WHAT IS THE INITIAL STATE OF THE TRIGGER?

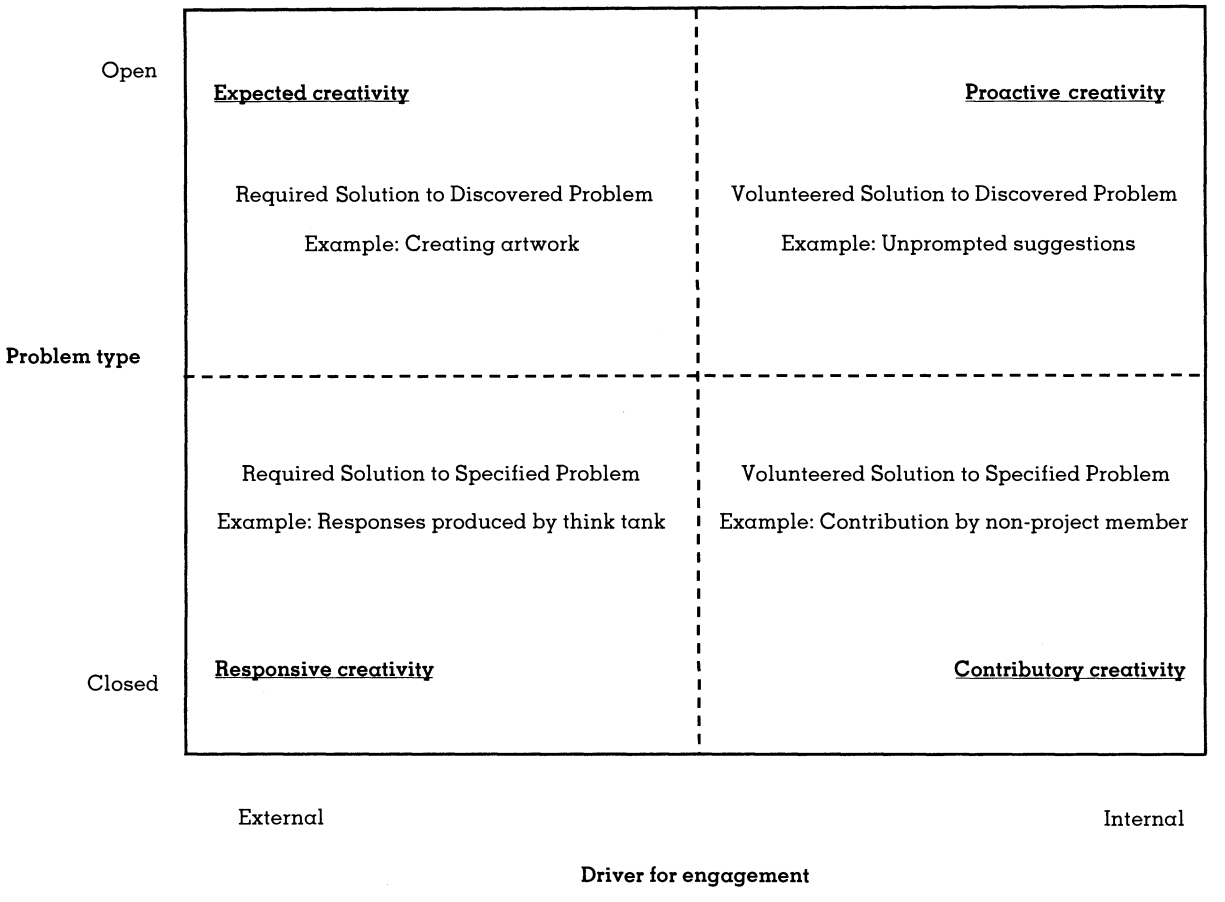
The second dimension of creative engagement is related to categorizing the problem itself. This can be found most notably in problem-finding research and particularly in the work of Getzels and Csikszentmihalyi (1967, 1976; Csikszentmihalyi & Getzels, 1970), Dillon (1982), and Wakefield (1991). In problem-finding research scholars examine the degree to which the problem has been formulated before the creator begins the process. In general, researchers propose a continuum ranging from closed to open problems (e.g., Getzels & Csikszentmihalyi, 1967).

A true closed problem is one that is presented to the participant, when the method for solving the problem is known. Getzels (1975) presents the example of a classroom algebra problem: students are asked the question after being given the relevant equations to solve the problem. Within the organizational arena, an example of a closed problem is a task requirement to make specific, well-understood changes. Open problems, however, occur when the participant is required to find, invent, or discover the problems. Dillon (1982) argues that most artistic endeavors generally represent open problems; responses to a suggestion scheme illustrate outcomes of organizational open problems. Therefore, I propose a second dimension of creativity engagement—namely, problem type—which ranges from closed, presented problems to open, discovered problems.

MATRIX OF CREATIVITY TYPES

From the two dimensions of driver type and problem type, a matrix of creativity types can be derived (see Figure 1). On the vertical axis, problem type ranges from closed (presented to the individual) to open (discovered by the individual). The horizontal axis represents the drivers behind engagement in the creative process and ranges from externally to internally driven. These dimensions represent continua, and different contexts can be located anywhere within the bounded space. To begin, I consider the four major categories.

FIGURE 1
Matrix of Creativity Types



Responsive Creativity

The externally driven, closed-problem field is one in which the participant responds to the requirements of the situation and to the presented problem. This domain is labeled "responsive creativity" and is the category in which the individual has the least control over problem-solving choices. In an organizational setting, examples of responsive creativity might be focus groups specifically arranged to solve particular problems.

Responsive creativity is the most prevalent form of creativity studied. The strong historical focus on creativity testing (see Amabile, 1996, or Albert & Runco, 1999) has meant that, that in many studies, participants are presented with a problem (the creativity test) and have external demands placed on them to engage in creativity. Thus, models derived from these studies may be relevant only to responsive creativity.

Responsive creativity can also be found in many studies of occupational creativity. Historically, in the literature on occupational creativity, researchers have been concerned primarily with "professional creatives"—for example, architects (Mackinnon, 1962), engineers (McDermid, 1965; Owens, 1969), and R&D scientists (Pelz & Andrews, 1966). Each of these occupations presents the incumbent with a demand for creativity. Of course, the degree to which the tasks are open or closed may depend upon the individual organization and/or the particular role or individual. For many, however, autonomy in choosing tasks may be limited. Thus, most literature in which researchers use the performance of professional creatives as the creative output can be seen as exploring responsive creativity.

In addition to the historical literature, more recent studies on occupational creativity also appear to focus on responsive creativity. Am-

abile, Conti, Coon, Lazenby, and Herron describe their creativity dependent variable as "a creative organization or unit, *where a great deal of creativity is called for,* and where people believe they actually produce creative work" (1996: 1166; emphasis added); this is clearly an examination of externally driven creativity. Scott and Bruce (1994) studied the innovative behavior of 172 R&D scientists and technicians, and although they did not specify responsive creativity, their sample of professional creatives may, in fact, have biased the dependent variable toward externally driven creativity. Because the degree to which the problems are open or closed is not specified in these studies, however, it is likely that both responsive and expected creativity are being measured.

Expected Creativity

Creativity that is brought about via an external expectation—but with a self-discovered problem—is labeled "expected creativity." In an organization, examples of expected creativity can be found in quality circles and in total quality management practices.

Within the creativity literature, Getzels and Csikszentmihalyi (1976) specifically measure expected creativity. They presented students with an array of objects, and the participants were then required to paint a still life after selecting and arranging objects on a table. The problem itself was open, in that the arrangement of objects was not formulated, yet the driver for engagement was external. Similarly, Amabile's research on art (Amabile, 1979), collage (Amabile, 1982), and poem creation (Amabile, 1985) represents creativity driven by external requirements, based upon open problems. Participants chose the specific topic and materials to use, but they did not have a choice in whether or not they wished to create the art form.

Contributory Creativity

The third category describes a type of creativity that is self-determined and based upon a clearly formulated problem. This category is labeled "contributory creativity," since most examples involve helping behaviors. For example, contributory creativity is evident in an employee who chooses to engage in creativity to help solve a problem with which he or she is not directly involved.

Within the creativity literature, a form of contributory creativity can be seen in Eisenberger, Fasolo, and Davis-LaMastro's (1990) work. These authors measured the creativeness of voluntary responses made to a specific open-ended question at the end of an employee survey. Although social demands may have increased the external pressure, the anonymity of the questionnaires should have decreased this effect. Therefore, those who responded were probably driven more by internal motivators than external demands.

Proactive Creativity

The last type of creativity is "proactive creativity." This occurs when individuals, driven by internal motivators, actively search for problems to solve. Volunteered suggestions for improving the manufacturing process by shopfloor workers and unprompted proposals for new products both represent organizational proactive creativity.

Within the creativity literature, there appear to be few studies involving some form of proactive creativity. In their recent contribution, Frese, Teng, and Wijnen (1999) examine participation in a suggestion scheme within a large Dutch steel factory. Similarly, Oldham and Cummings (1996) use contributions to a suggestion scheme as one of their dependent variables of creativity at work. However, in both these studies the extent to which employees were externally encouraged to participate in the suggestion scheme is unclear. It is possible that employees in one organization might have been required to participate regularly in a suggestion scheme, whereas employees in another might have contributed because of more internal drivers. Thus, it is difficult to disentangle proactive creativity from its expected counterpart in these studies.

Caveats

Three caveats are in order before moving on. First, the relationship between the two dimensions might not be orthogonal. Indeed at a more abstract level, they might both be conceived of

as relating to external constraint.[2] The more external the driver type, the greater the external constraint, and the more closed the problem, the greater the external constraint. Amabile (1982, 1996) suggests that the greater the extrinsic constraint, the less creativity shown. Thus, responsive creativity may be "less creative" than proactive creativity. However, because I am concerned primarily with types of creativity, rather than levels (cf. Kirton's [1989] differentiation between styles and levels), I will not go into detail on this aspect.

Second, among these four types, more fine gradations may be found. As mentioned earlier, in some studies researchers employ a version of closed problems that are not entirely closed, whereas others represent open problems that are not fully open. Similarly, it is likely that some creative processes may be more or less externally—or internally—driven. Thus, one must remember that the four categories defined in this model span more differentiated continua.

Third, although I have used different examples to demonstrate the creativity types, the same example might represent different types, depending upon the specific situational circumstances in which it developed. For example, a new product design might be classified as responsive if the designer was given explicit specifications and methodologies, expected if the specifications were not formulated, contributory if the problem was specified but not within the designer's role, and proactive if the designer was a shopfloor worker solving an unformulated problem. Therefore, as many theorists before have suggested (e.g., Amabile, 1996; Ford, 1996), the situational context in which the creativity occurs must be considered.

VERIFYING THE MATRIX: RELATIONSHIPS ACROSS DIFFERENT CONTEXTUAL DOMAINS

If the assumptions underlying the creativity matrix are correct, then researchers trying to find relationships among measures of creativity may, in fact, be gathering data on different types of creativity. Therefore, the relationship between measures addressing a particular creativity type should be stronger than those measures addressing different types.

Some evidence for this effect can be found in the literature. For example, Davis, Peterson, and Farley (1974) found a strong relationship between two of Torrance's (1974) tests of creative motivation (r = .66), indicating strong links between responsive creativity measures. There was, however, a negligible relationship between these measures of responsive creativity and the rated creativity of the project the participants completed (expected creativity; r = .05). Similarly, in a sample of school students, Davis and Belcher (1971) reported high intercorrelations among divergent thinking tests (responsive creativity), yet they found only small correlations between the divergent thinking tests and proactive creative activity.

More recently, Guastello, Bzdawka, Guastello, and Rieke (1992) found significant intercorrelations among six divergent thinking tests (responsive creativity; r = .21 to r = .42); however, the relationships between the six divergent thinking tests and the artistic and scientific survey (a proxy measure of proactive creativity) were substantially lower, with only two correlations higher than .15. Similarly, Oldham and Cummings (1996) found a significant relationship between the two measures of responsive creativity (patents and supervisor ratings; r = .23) but no relationships between these and the measure of proactive creativity (suggestion scheme; r = .01 and r = .18, respectively).

We can see from this initial examination that the relationships within a given creativity type are stronger than relationships across types. Based on this, I propose that future research involving more rigorous examination will show similar results.

IMPLICATIONS

Theoretical

The splitting of creativity into four categories has highlighted a previously underaddressed topic: proactive creativity. There may be reasons for not addressing it, yet these reasons are more likely to be logistical rather than theoretical or practical. Proactive creativity is difficult to measure, especially in the laboratory. Yet, leading organizational figures recognize the importance of proactive creativity (e.g., Ambrose, 1995; Blair,

[2] I am indebted to an anonymous reviewer for making this suggestion.

1999; Gates, 1995), and there is a need to understand all forms of creativity in order to establish universal theory (cf. Berry, 1989). Thus, it is important that we further develop the proactive creativity construct.

Proactive creativity is not a completely new concept; facets of it can be seen in many other phenomena in the organizational literature. Recently, Morrison and Phelps (1999) proposed the construct of "taking charge": employees voluntarily effecting unspecified change in their organization. Nevertheless, taking charge is oriented toward and operationalized by measuring innovative behaviors rather than creativity. As Amabile (1996), Axtell et al. (2000), and Unsworth (2000) discuss, innovation is concerned also with implementation of ideas, whereas creativity is only the generation of ideas. Taking charge is operationalized as acts of implementation rather than generation of ideas; thus, taking charge is an innovative, rather than creative, behavior. As such, proactive creativity is related to, but distinct from, taking charge behaviors.

The second distinction is between proactive creativity and voice citizenship behaviors. Van Dyne and colleagues (Van Dyne, Graham, & Dienesch, 1994; Van Dyne & LePine, 1998) define voice citizenship as "making innovative suggestions for change and recommending modifications to standard procedures even when others disagree" (Van Dyne & LePine, 1998: 109). Again, although there appear to be many similarities in the definitions of proactive creativity and voice, the operationalization of the measure does not correspond. In this case, voice measurement does not emphasize creativity, and only one item in the six-item scale refers to ideas or changes; the remaining items concern involvement, "speaking up," and keeping informed. Thus, I propose that proactive creativity is distinct from voice citizenship.

Proactive creativity is similar to Bateman and Crant's (1993) concept of a proactive personality. However, its relevance to proactive creativity is restricted, since it focuses upon the predictor of proactive behavior (individual traits), rather than the behavior itself. Thus, this research, although fruitful in its own right, is again distinct from proactive creativity.

Finally, proactive creativity is very closely related to the concept of personal initiative (Frese, Kring, Soose, & Zempel, 1996). Nonetheless, initiative is not synonymous with creativity. Initiative is concerned with general problem solving and includes using established ideas, methods, and procedures. Proactive creativity belongs within this wider category, but the two concepts do not always refer to the same construct.

Proactive creativity, therefore, can be distinguished from related concepts. As noted earlier, there is very little research regarding proactive creativity in the creativity literature. Further development of this construct is clearly needed.

Are there differences in the processes? There are many theories concerning the creative process (e.g., Amabile, 1996), yet the proposition that the process may change depending upon the type of creativity has not been considered. I believe this is an important step, and I discuss the implications of the creativity matrix upon such a consideration.

As one moves along the vertical dimension of the matrix (problem type), the activities involved in the preparation for an idea change. Getzels (1975) states that open problems, compared to closed problems, require the problem to be formulated by the individual. However, before the formulation can begin, a problem must be identified. Therefore, creatively solving an open problem involves both scanning the environment to find a problem and then defining the problem in such a way that it can be solved. The processes of expected and proactive creativity, therefore, may involve more scanning and defining activities than those of responsive and contributory creativity.

The evaluative component of the creative process may also change, depending upon the creativity type. Ideas that are driven by internal means are, by definition, not recognized as required at the time of conception. Thus, these proactive and contributory ideas may need to be "sold" to evaluators in order to preclude immediate dismissal of them.

To summarize, it appears there may be additional activities involved in the processes of certain types of creativity. Expected and proactive creativity involve scanning and defining activities that are not included in responsive or contributory creativity and that are ignored in accounts of the creative process. Further, proactive and contributory creativity involve a selling component that is not found in responsive or expected creativity.

Are key predictors different? The factors that affect creativity at work are highlighted in three

commonly cited models: Amabile (1983, 1996), Ford (1996), and Woodman et al. (1993). However, these theories fail to differentiate between types of creativity. This is particularly evident regarding motivation. While all three theories offer motivational predictors, the degree of motivation needed (both intrinsic and extrinsic) differs across types. Responsive and expected creativity are necessary and require less effort (in activities such as scanning and selling) than proactive and contributory creativity. As such, the relationship between motivation (both intrinsic and extrinsic) and creativity will be stronger for those types requiring more effort (proactive and contributory creativity) than for those types requiring less effort (responsive and expected creativity).

There are also predictors relating to the additional processes found in certain types of creativity. Because expected and proactive creativity might involve more scanning and defining activities than responsive and contributory creativity, factors facilitating these activities will only affect the former creativity types. Such factors might include curiosity (e.g., Berlyne, 1950), training in problem finding (e.g., Fontenot, 1993), and the amount of environment-focused versus task-focused attention. In addition, proactive and contributory creativity involve more selling behaviors than responsive or expected creativity. Thus, factors that influence an employee's credibility (e.g., status, power, knowledge) or their selling skills (e.g., social skills, negotiation tactics) will affect proactive and contributory creativity, but not responsive and expected creativity.

An example from research currently underway illustrates the potential for predictors to have differential effects on types of creativity (Unsworth & Clegg, 2000a). Interviews with seventy design engineers clearly showed that time pressure had opposing effects on creativity, depending upon the task. Time pressure appeared to have a positive influence on creativity for the engineer, when designing a well-specified component, since it helped the engineer focus. However, when the creative task was not formulated or not within the engineer's work role (e.g., modifying procedures), time pressure was a hindrance. It can be seen, in this instance, that responsive creativity was facilitated by time pressure, whereas expected and proactive creativity were inhibited by it.

Methodological

As noted earlier, studies to date generally have focused on responsive creativity. The neglect of other types is detrimental not only to our understanding of these particular types of creativity but also to our understanding of organizational creativity in general (Berry, 1989). A common methodology that measures all four creativity types will enable us to examine the similarities and differences among the facilitators, processes, and outputs of the creativity types.

While this may seem plausible in theory, in practice it may be much more difficult. Since many laboratory experiments present external drivers to participants, researchers may consider using field studies. However, field studies involve a number of logistical difficulties, such as gaining access, ensuring consistent participation, and coping with organizational and environmental changes. Researchers either must rely upon retrospective, self-reported data (with all the problems that technique incurs), or they must attempt to view the engagement themselves, through ethnographic studies (and hope that they are in the right place at the right time).

Another alternative is the use of diary studies (Unsworth & Clegg, 2000b). These entail participants noting ideas as they occur (together with their driver, problem, and subsequent actions). The researcher is then able to distinguish among the different types of creativity, based upon the driver and the problem outlined. Of course, there is still a reliance upon the individual to record complete and accurate information, and there is a need, as a researcher, to be aware of the dangers of implicitly encouraging ideas and thereby inducing expected creativity. Nonetheless, attempts at gleaning such rich information, by whatever methodology, will prove fruitful in understanding all forms of creativity.

CONCLUSION

Challenging assumptions is a commonly found predictor of creativity (e.g., Amabile & Gryskiewicz, 1987). Yet, as creativity researchers, we have not heeded our own advice and have assumed creativity to be a homogenous construct. I challenged this assumption by combining the dimension "Why engage in creativity?" with "What is the initial state of the trig-

ger?" This led to a matrix of creativity types, including responsive creativity (responding to presented problems because of external drivers), expected creativity (discovering problems because of external drivers), contributory creativity (responding to presented problems because of internal drivers), and proactive creativity (discovering problems because of internal drivers). In future research we must explore these creativity types and their many implications.

REFERENCES

Albert, R. S., & Runco, M. A. 1999. A history of research on creativity. In R. S. Sternberg (Ed.), ***Handbook of creativity:*** 16–31. Cambridge: Cambridge University Press.

Amabile, T. M. 1979. Effects of external evaluation on artistic creativity. ***Journal of Personality and Social Psychology,*** 37: 221–233.

Amabile, T. M. 1982. Children's artistic creativity: Detrimental effects of competition in a field setting. ***Personality and Social Psychology Bulletin,*** 8: 573–578.

Amabile, T. M. 1983. The social psychology of creativity: A componential conceptualization. ***Journal of Personality and Social Psychology,*** 45: 357–376.

Amabile, T. M. 1985. Motivation and creativity: Effects of motivational orientation on creative writers. ***Journal of Personality and Social Psychology,*** 48: 393–399.

Amabile, T. M. 1996. ***Creativity in context: Update to "The Social Psychology of Creativity."*** Boulder, CO: Westview.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. 1996. Assessing the work environment for creativity. ***Academy of Management Journal,*** 39: 1154–1184.

Amabile, T. M., & Gryskiewicz, S. S. 1987. ***Creativity in the R&D laboratory.*** Technical report No. 30. Greensboro, NC: Center for Creative Leadership.

Axtell, C. M., Holman, D. J., Unsworth, K. L., Wall, T. D., Waterson, P., & Harrington, E. 2000. Shopfloor innovation: Facilitating the suggestion and implementation of ideas. ***Journal of Occupational and Organizational Psychology,*** 73: 265–286.

Barron, F., & Harrington, D. M. 1981. Creativity, intelligence and personality. ***Annual Review of Psychology,*** 32: 439–476.

Bateman, T. S., & Crant, J. M. 1993. The proactive component of organizational behavior: A measure and correlates. ***Journal of Organizational Behavior,*** 14: 103–118.

Berlyne, D. E. 1950. Novelty and curiosity as determinants of exploratory behavior. ***British Journal of Psychology,*** 41: 68–80.

Berry, J. W. 1989. Imposed etics-emics-derived etics: The operationalization of a compelling idea. ***International Journal of Psychology,*** 24: 721–735.

Csikszentmihalyi, M., & Getzels, J. W. 1970. Concern for discovery: An attitudinal component of creative production. ***Journal of Personality,*** 38: 91–105.

Datta, L. E. 1963. Test instructions and identification of creative scientific talent. ***Psychological Reports,*** 13: 495–500.

Davis, G. A., & Belcher, T. L. 1971. How shall creativity be measured? Torrance tests, RAT, Alpha Biographical, and IQ. ***Journal of Creative Behavior,*** 5: 153–161.

Davis, G. A., Peterson, J. M., & Farley, F. H. 1974. Attitudes, motivation, sensation seeking, and belief in ESP as predictors of real creative behavior. ***Journal of Creative Behavior,*** 8: 31–39.

Deci, E. L., & Ryan, R. M. 1987. The support of autonomy and the control of behavior. ***Journal of Personality and Social Psychology,*** 53: 1024–1037.

Dillon, J. T. 1982. Problem finding and solving. ***Journal of Creative Behavior,*** 16: 97–111.

Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. 1990. Perceived organizational support and employee diligence, commitment, and innovation. ***Journal of Applied Psychology,*** 75: 51–59.

Fontenot, N. A. 1993. Effects of training in creativity and creative problem finding upon business people. ***Journal of Social Psychology,*** 133: 11–22.

Ford, C. M. 1996. A theory of individual creative action in multiple social domains. ***Academy of Management Review,*** 21: 1112–1142.

Frese, M., Kring, W., Soose, A., & Zempel, J. 1996. Personal initiative at work: Differences between East and West Germany. ***Academy of Management Journal,*** 39: 37–63.

Frese, M., Teng, E., & Wijnen, C. J. D. 1999. Helping to improve suggestion systems: Predictors of making suggestions in companies. ***Journal of Organizational Behavior,*** 20: 1139–1155.

Freud, S. 1908. The relation of the poet to day-dreaming. In ***Collected Papers,*** vol. 4: 173–183. London: Hogarth Press.

Getzels, J. W. 1975. Problem-finding and the inventiveness of solutions. ***Journal of Creative Behavior,*** 9: 12–18.

Getzels, J. W., & Csikszentmihalyi, M. 1967. Scientific creativity. ***Science Journal,*** 3: 80–84.

Getzels, J. W., & Csikszentmihalyi, M. 1976. ***The creative vision: A longitudinal study of problem-finding in art.*** New York: Wiley.

Goodale, R. A. 1970. Methods for encouraging creativity in the classroom. ***Journal of Creative Behavior,*** 4: 80–102.

Guastello, S. J., Bzdawka, A., Guastello, D. D., & Rieke, M. L. 1992. Cognitive abilities and creative behaviors: CAB-5 and consequences. ***Journal of Creative Behavior,*** 26: 260–267.

Guilford, J. P. 1950. Creativity. ***American Psychologist,*** 5: 444–454.

Jehn, K. A. 1995. A multimethod examination of the benefits and detriments of intragroup conflict. ***Administrative Science Quarterly,*** 40: 256–282.

Kirton, M. J. 1989. ***Adaptors and innovators: Styles of creativity and problem-solving.*** London: Routledge.

Mackinnon, D. W. 1962. The personality correlates of creativity: A study of American architects. In G. S. Nielsen (Ed.), ***Proceedings of the 14th International Congress of Applied Psychology:*** 11–39. Copenhagen: Munksgaard.

Mayer, R. E., & Sims, V. K. 1994. For whom is a picture worth a thousand words? Extensions of a dual-coding theory of multi-media learning. ***Journal of Educational Psychology,*** 86: 389–401.

McDermid, C. D. 1965. Some correlates of creativity in engineering personnel. ***Journal of Applied Psychology,*** 49: 14–19.

Mednick, S. A. 1962. The associative basis of the creative process. ***Psychological Review,*** 69: 220–232.

Morrison, E. W., & Phelps, C. C. 1999. Taking charge at work: Extrarole efforts to initiate workplace change. ***Academy of Management Journal,*** 42: 403–419.

Mumford, M. D., & Gustafson, S. B. 1988. Creativity syndrome: Integration, application and innovation. ***Psychological Bulletin,*** 103: 27–43.

Oldham, G. R., & Cummings, A. 1996. Employee creativity: Personal and contextual factors at work. ***Academy of Management Journal,*** 39: 607–634.

Owens, W. A. 1969. Cognitive, noncognitive and environment correlates of mechanical ingenuity. ***Journal of Applied Psychology,*** 53: 199–208.

Pelz, D. C., & Andrews, F. M. 1966. Autonomy, coordination, and stimulation in relation to scientific achievement. ***Behavioral Science,*** 11: 89–97.

Royce, J. 1898. The psychology of invention. ***Psychological Review,*** 5: 113–144.

Scott, S. G., & Bruce, R. A. 1994. Determinants of innovative behavior: A path model of individual innovation in the workplace. ***Academy of Management Journal,*** 37: 580–607.

Simonton, D. K. 1975. Sociocultural context of individual creativity: A transhistorical time-series analysis. ***Journal of Personality and Social Psychology,*** 32: 1119–1133.

Stein, K. B. 1967. Correlates of the ideational preference dimension among prison inmates. ***Psychological Reports,*** 21: 553–562.

Sternberg, R. J. (Ed.). 1999a. ***Handbook of creativity.*** New York: Cambridge University Press.

Sternberg, R. J. 1999b. A propulsion model of types of creative contributions. ***Review of General Psychology,*** 3: 83–100.

Torrance, E. P. 1974. ***The Torrance tests of creative thinking.*** Bensenville, IL: Scholastic Testing Services.

Unsworth, K. L. 2000. ***Employee innovation: The roles of idea generation and idea implementation.*** Paper presented at the annual conference of the Society for Industrial-Organizational Psychology, New Orleans.

Unsworth, K. L., & Clegg, C. 2000a. ***Employee innovation: Report to participating companies.*** Internal report. Sheffield, UK: University of Sheffield.

Unsworth, K. L., & Clegg, C. 2000b. ***Measuring innovation.*** Working paper, Institute of Work Psychology, University of Sheffield, UK.

Van Dyne, L., Cummings, L. L., & McLean Parks, J. 1995. Extra role behaviors: In pursuit of construct and definitional clarity. In L. L. Cummings & B. M. Staw (Eds.), ***Research in organizational behavior,*** vol. 17: 215–285. Greenwich, CT: JAI Press.

Van Dyne, L., Graham, J. W., & Dienesch, R. M. 1994. Organizational citizenship behavior: Construct redefinition, measurement and validation. ***Academy of Management Journal,*** 37: 765–802.

Van Dyne, L., & LePine, J. A. 1998. Helping and voice extrarole behaviors: Evidence of construct and predictive validity. ***Academy of Management Journal,*** 41: 108–119.

Wakefield, J. F. 1991. The outlook for creativity tests. ***Journal of Creative Behavior,*** 25: 184–193.

Wallas, G. 1926. ***The art of thought.*** New York: Harcourt Brace.

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. 1993. Toward a theory of organizational creativity. ***Academy of Management Review,*** 18: 293–321.

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