Motivating Creativity in Organizations: ON DOING WHAT YOU LOVE AND LOVING WHAT YOU DO

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Arthur Schawlow, winner of the Nobel prize in physics in 1981, was once asked what, in his opinion, made the difference between highly creative and less creative scientists. He replied, “The labor of love aspect is important. The most successful scientists often are not the most talented. But they are the ones who are impelled by curiosity. They’ve got to know what the answer is.” Schawlow’s insights about scientific creativity highlight the importance of intrinsic motivation: the motivation to work on something because it is interesting, involving, exciting, satisfying, or personally challenging. There is abundant evidence that people will be most creative when they are primarily intrinsically motivated, rather than extrinsically motivated by expected evaluation, surveillance, competition with peers, dictates from superiors, or the promise of rewards.

Interestingly, this Intrinsic Motivation Principle of Creativity applies not only to scientific creativity, but to business creativity as well. Often, financial success is closely tied to a passion for the work itself. Michael Jordan, who by the mid-1990s was the most financially successful basketball player in history, insisted on a “love of the game” clause in his contract—securing for him the right to play in “pick-up” games whenever he wished. Robert Carr, a primary developer of the first pen computer, was captivated by the opportunity to do something spectacular that had never been done before. When entrepreneur Jerry Kaplan described the idea to him, Carr reacted with intense excitement: “Jerry, it’s not a question of whether I want to do this. I have to do this. This is important. This is profound. . . . It’s not very often that opportunities like this come along—something really big, a chance to really make a difference. Maybe once a decade or so. I think you’ve got one here.”
When Steve Wozniak invented the micro-computer, he demonstrated creativity in new product development; for all intents and purposes, such a thing had not existed before. When Walt Disney created Disneyland, he demonstrated creativity in new service development; he essentially invented a new form of entertainment. Although most people think of creativity in business as limited to the creation of something new to sell, there are other forms as well. When Fred Smith developed the concept for Federal Express, he certainly was not inventing a new service or a new product; humans had been delivering messages and packages to each other for thousands of years. In this instance, the creativity resided in the system for delivery: a hub system, where all packages were flown to Memphis on the same day, sorted, and distributed for air delivery the next day. Creativity exists in less famous, more humble, examples as well: the ad campaign that revitalizes a dying brand, or the product line extension that captures additional market share.

At its heart, creativity is simply the production of novel, appropriate ideas in any realm of human activity, from science, to the arts, to education, to business, to everyday life. The ideas must be novel—different from what's been done before—but they can’t be simply bizarre; they must be appropriate to the problem or opportunity presented. Creativity is the first step in innovation, which is the successful implementation of those novel, appropriate ideas. And innovation is absolutely vital for long-term corporate success. Because the business world is seldom static, and because the pace of change appears to be rapidly accelerating, no firm that continues to deliver the same products and services in the same way can long survive. By contrast, firms that prepare for the future by implementing new ideas oriented toward this changing world are likely to thrive.

**Individual Creativity**

To some extent, intrinsic motivation resides in a person’s own personality. Some people are more strongly driven than others by the enjoyment and sense of challenge in their work. For example, Pablo Casals was driven by passion for the cello from the day he first heard the instrument played: “I had never heard such a beautiful sound before. A radiance filled me. I said, ‘Father, that is the most wonderful instrument I have ever heard. That is what I want to play.’” The novelist John Irving, in explaining his motivation to write for up to 14 hours in a single day, said, “The unspoken factor is love. The reason I can work so hard at my writing is that it’s not work for me.”

Although part of intrinsic motivation depends on personality, my students, colleagues, and I have discovered in 20 years of research that a person’s social environment can have a significant effect on that person’s level of intrinsic motivation at any point in time; the level of intrinsic motivation can, in turn, have a significant effect on that person’s creativity. Einstein described the dampening effect of a militaristic classroom environment on his own intrinsic motivation when he said, “This coercion had such a deterring effect upon me that, after
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I had passed the final examination, I found the consideration of any scientific problems distasteful for an entire year." He later concluded, "It is a very grave mistake to think that the enjoyment of seeing and searching can be promoted by means of coercion and a sense of duty."

Much of the evidence on this connection between the social environment, intrinsic motivation, and creativity comes from controlled laboratory experiments. In one such study, for example, college students were presented with a simple artistic creativity task—making a paper collage with a standard set of materials. Half of the students were randomly assigned to a condition where they were offered a reward (money) for making the collage, and half were simply given the collage activity to do. In addition, half within each group were given a choice; they were asked whether they would agree to make the collage in order to get the money (in the choice/reward condition), or they were simply asked whether they wanted to make the collage (in the choice/non-reward condition). Students in the no-choice condition were not offered any choice in the matter; those in the no-choice/reward condition were simply presented with the reward as a bonus, and those in the no-choice/non-reward condition were simply given the collage task.

The results were quite clear and striking. The students who had essentially made a contract to do the activity in order to get the reward (choice/reward condition) exhibited strikingly lower levels of creativity in their collages than the other three groups. The "means-end" work environment—"Do this task as a means to the end of getting this reward"—appears to have undermined their creativity. In contrast, however, those students who received the reward as a bonus showed no diminishment in creativity. In fact, their creativity was higher than those of the other groups. And, in keeping with the Intrinsic Motivation Principle of Creativity, students' creativity was correlated with their reported interest in the collage activity; the more interested they were, the more creative their collages were judged by art experts. Thus, it was not the fact of reward, but the perception of reward (resulting from the way in which it was presented) that made the difference.

Another experiment addressed the Intrinsic Motivation hypothesis even more directly. In this study, young creative writers were asked to fill out a short questionnaire before writing a poem. The questionnaire was designed to have them focus on either their intrinsic reasons for being a writer (such as getting a lot of pleasure out of something good that you have written) or their extrinsic reasons for being a writer (such as getting rich and famous). (Participants in a control condition filled out an unrelated, non-motivational questionnaire.) They then wrote poems, which were later judged by experts in creative writing. The writers in the intrinsic condition and the control condition wrote poems that were judged as quite creative, on average. However, those who had focused for just a few minutes on the extrinsic motivations for their work wrote poems that were significantly less creative.
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The Componential Theory of Individual Creativity

According to conventional wisdom, creativity is something done by creative people. Even creativity researchers, for several decades, seemed to guide their work by this principle, focusing predominantly on individual differences: What are creative people like, and how are they different from most people in the world? Although this person-centered approach yielded some important findings about the backgrounds, personality traits, and work styles of outstandingly creative people, it was both limited and limiting. It offered little to practitioners concerned with helping people to become more creative in their work, and it virtually ignored the role of the social environment in creativity and innovation. In contrast to the traditional approach, the Componential Theory of Creativity assumes that all humans with normal capacities are able to produce at least moderately creative work in some domain, some of the time—and that the social environment (the work environment) can influence both the level and the frequency of creative behavior.

The theory includes three major components of individual (or small team) creativity, each of which is necessary for creativity in any given domain: expertise, creative-thinking skill, and intrinsic task motivation (see Figure 1). The componential theory suggests that creativity is most likely to occur when people's skills overlap with their strongest intrinsic interests—their deepest passions—and that creativity will be higher, the higher the level of each of the three components. This is the "creativity intersection" depicted in Figure 1.

Expertise

Expertise is the foundation for all creative work. It can be viewed as the set of cognitive pathways that may be followed for solving a given problem or doing a given task—the problem solver's "network of possible wanderings." The expertise component includes memory for factual knowledge, technical proficiency, and special talents in the target work domain—such as expertise in gene splicing, or in computer simulation, or in strategic management. For example, a high-tech engineer's expertise includes his innate talent for imagining and thinking about complex engineering problems, as well as focusing in on the important aspects of those problems; his factual knowledge about electronics; his familiarity with past work and current developments in high-tech engineering; and the technical skills he has acquired in designing, carrying out, and interpreting research.

Creative Thinking

This component provides that "something extra" of creative performance. Assuming that a person has some incentive to perform an activity, performance will be "technically good" or "adequate" or "acceptable" if the requisite expertise is in place. However, even with expertise at an extraordinarily high level, the person will not produce creative work if creative thinking skills are...
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FIGURE 1. 3 Component Model of Creativity

*Expertise*

*Creativity Skills*

*Creativity*

*Task Motivation*

lacking. These skills include a cognitive style favorable to taking new perspectives on problems, an application of techniques (or “heuristics”) for the exploration of new cognitive pathways, and a working style conducive to persistent, energetic pursuit of one’s work.

Creative thinking depends to some extent on personality characteristics related to independence, self-discipline, orientation toward risk-taking, tolerance for ambiguity, perseverance in the face of frustration, and a relative lack of concern for social approval. However, creativity skills can be increased by the learning and practice of techniques to improve cognitive flexibility and intellectual independence.

An engineer’s arsenal of creativity skills might include his ability to break out of a pre-conceived perception or expectation when examining testing
results, his tolerance for ambiguity in the process of deciding on the appropriate interpretation for puzzling data, his ability to suspend judgment as he considers different approaches, and his ability to break out of strict algorithms for attacking a problem. He might also have learned to employ some of the creativity heuristics described by theorists: "When all else fails, try something counterintuitive;"18 or "Make the familiar strange."19 Finally, if he is productively creative, his work style is probably marked by an ability to concentrate effort for long periods of time20 and an ability to abandon unproductive strategies, temporarily putting aside stubborn problems.21

Intrinsic Task Motivation

Although the two skill components determine what a person is capable of doing in a given domain, it is the task motivation component that determines what that person actually will do. Motivation can be either intrinsic (driven by deep interest and involvement in the work, by curiosity, enjoyment, or a personal sense of challenge) or extrinsic (driven by the desire to attain some goal that is apart from the work itself—such as achieving a promised reward or meeting a deadline or winning a competition). Although combinations of intrinsic and extrinsic motivation are common, one is likely to be primary for a given person doing a given task. A number of studies have shown that a primarily intrinsic motivation will be more conducive to creativity than a primarily extrinsic motivation.

Task motivation makes the difference between what an engineer can do and what he will do. The former depends on his levels of expertise and creative thinking skills. But it is his task motivation that determines the extent to which he will fully engage his expertise and creative thinking skills in the service of creative performance. To some extent, a high degree of intrinsic motivation can even make up for a deficiency of expertise or creative thinking skills. A highly intrinsically motivated person is likely to draw skills from other domains, or apply great effort to acquiring necessary skills in the target domain.22

Although a person’s development of expertise and practice of creative thinking skills can be influenced to some extent by the social environment, the strongest and most direct influence of the environment is probably on motivation. Certainly, a person starts out with a level of intrinsic motivation that depends on his or her basic enjoyment of the work. But experiments like those described earlier have shown how a person’s basic motivational orientation for a task, and resulting creativity on that task, can be influenced by even momentary alterations in the work environment. For example, an engineer may be highly intrinsically motivated to undertake a new project of his own design, but he may be singularly uninterested in a project handed to him by the director of the lab.

Motivational Synergy

The prevailing psychological model of the interaction between intrinsic and extrinsic motivation suggests an antagonism: as extrinsic motivation for an
activity increases, intrinsic motivation must decrease. But there is considerable evidence from field research that, under certain conditions, certain forms of extrinsic motivation may combine synergistically with intrinsic motivation, enhancing (or at least not undermining) the positive effects of intrinsic motivation on creativity. For example, research in business organizations has uncovered several extrinsic motivators operating as supports to creativity: reward and recognition for creative ideas, clearly defined overall project goals, and frequent constructive feedback on the work.

What determines whether extrinsic motivation will combine positively with intrinsic motivation, or detract from it, in influencing creativity? There are three important determinants: the person's initial motivational state, the type of extrinsic motivator used, and the timing of the extrinsic motivation.

First, the initial level of intrinsic motivation may play a crucial role. It may be that, if a person is deeply involved in the work because it is interesting or personally challenging, that degree of intrinsic motivation may be relatively impervious to the undermining effects of extrinsic motivators. Research has shown that a person's attitudes and motives will be most subject to external influences when those attitudes and motives are vague or ambiguous. So, we might expect additive effects of intrinsic and extrinsic motivation when intrinsic motivation toward the work is already strong and salient. On the other hand, we might expect negative effects when intrinsic motivation is relatively weak. Thus, if an engineer is passionately interested in the development of the products he is working on, he may be relatively immune to negative effects of extrinsic motivators on his intrinsic motivation and creativity.

Second, the type of extrinsic motivation may make a difference. "Synergistic extrinsic motivators," including certain types of reward, recognition, and feedback, do not necessarily undermine intrinsic motivation; indeed, they may actually enhance some aspects of performance. These outcomes can result from reward, recognition, and feedback that either confirm competence or provide important information on how to improve performance; these are called informational extrinsic motivators. Positive outcomes can also result from reward, recognition, and feedback that directly increase the person's involvement in the work itself; these are called enabling extrinsic motivators. For example, if a high tech firm recognizes outstanding performance by approving the allocation of additional technical resources to its engineers, the effects on intrinsic motivation are likely to be positive. On the other hand, constraint on how work can be done, as well as other types of reward, recognition, and feedback, will be detrimental to intrinsic motivation and performance. These "non-synergistic extrinsic motivators," which are controlling extrinsic motivators, may never combine positively with intrinsic motivation, because they undermine a person's sense of self-determination. The engineer who works under stringent controls on how to approach a project, or for whom rewards signify attempts to control his behavior, will likely evidence decreased intrinsic motivation and creativity.
Third, the timing of extrinsic motivation may be important. Recall that creative ideas are marked by both novelty and appropriateness. While some stages of the creative process are most important in determining the novelty of an idea, other stages are more important in determining appropriateness. Synergistic extrinsic motivators may be most useful at those stages of the creative process where high degrees of novelty do not come into play—such as the gathering of background information or the validation of a chosen solution. Here, some level of outward focus, engendered by extrinsic motivation, may cue the problem-solver to the appropriateness of certain kinds of information or the workability of final solutions. However, it may be optimal to reduce all types of extrinsic motivators at those stages requiring the greatest novelty—such as the initial problem formulation or the generation of ideas.

The Intrinsic Motivation Principle

All of this research on motivation leads to the Intrinsic Motivation Principle of Creativity, which can be formally stated as follows: Intrinsic motivation is conducive to creativity. Controlling extrinsic motivation is detrimental to creativity, but informational or enabling extrinsic motivation can be conducive, particularly if initial levels of intrinsic motivation are high.

The Work Environment for Creativity

Although the experimental research is important in establishing causal connections between the social environment, motivation, and creativity, the most directly relevant information comes from interview and survey studies within corporations. It is through these studies that we began to understand the social environment in organizations and how it might impact creativity.

Recently, with my colleagues Regina Conti, Heather Coon, Jeffrey Lazenby, and Michael Herron, I studied the work environments surrounding project teams in a large company that we call High Tech Electronics International. Our purpose was to determine whether and how the work environments of highly creative projects differed from the work environments of less creative projects. The primary research tool was an instrument called KEYS: Assessing the Climate for Creativity. It consists of 78 items that constitute eight scales addressing different aspects of the work environment, plus two scales assessing the work outcomes of creativity and productivity. Of the eight environment scales, six focus on Environmental Stimulants to Creativity—factors that should be positively related to creative work outcomes—including freedom, positive challenge, supervisory encouragement, work group supports, organizational encouragement, and sufficient resources. Two scales focus on Environmental Obstacles to Creativity—factors that should be negatively related to creative work outcomes—including organizational impediments and excessive workload pressure. (See Table 1 for scale descriptions.)
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over a 12-year period, with over 12,000 individual employees from 26 different companies, have established the reliability and validity of this instrument.*^ High Tech is a United States company of over 30,000 employees providing diversified electronics products to international markets. The company has several divisions, with a large number of research and development projects going on within each division at any point in time. We conducted this study in three phases, across four divisions and a large number of projects. In Phase 1, we asked both technical and non-technical middle-level managers individually to nominate both the highest-creativity and the lowest-creativity project with which they had been involved during the previous three years in the company. For both projects, we asked them to select only from that set of projects in which creativity was both possible and desirable. This eliminated any low creativity projects that simply involved carrying out a routine task, and it allowed us to focus on differences between successful and unsuccessful attempts at creative project work. Instructions to the nominating managers defined creativity as "the production of novel and useful ideas by individuals or teams of individuals." These managers briefly described each nominated project (using a standard questionnaire) and completed a KEYS work environment assessment on each nominated project.

Phase 2 of the study was conducted to validate the creativity nominations of Phase 1, by allowing independent expert assessments of the level of creativity in the projects nominated in Phase 1. A group of experts from each of the four target divisions was asked to independently rate the projects nominated from that division on creativity and several other dimensions. These experts were unaware of the initial nomination status of the projects, and high- and low-creativity projects were randomly intermixed in the experts' rating questionnaires. (They were asked to skip the ratings for any projects with which they were not familiar.)

Phase 3 was conducted to validate any work environment differences between the high- and low-creativity projects discovered in Phase 1. We selected a sub-set of the projects from Phase 1, those that had been most strongly and reliably rated by the expert judges as either high in creativity or low in creativity. We then asked each member of those project teams to complete a KEYS survey to describe the work environment of his or her particular project. These respondents did not know that the study concerned creativity, or that their projects had been chosen for any particular reason. In fact, people were eliminated from participation in Phase 3 if they had participated in Phase 1. Furthermore, each respondent in Phase 3 focused on only one project, rather than the two contrasting projects for Phase 1 respondents. In this way, we attempted to eliminate any biases that might have arisen when the Phase 1 respondents explicitly contrasted the work environment of a project that they considered highly creative with one that they considered quite uncreative.

In Phase 1, the nominated high-creativity projects were significantly higher than the nominated low-creativity projects on all six work environment
TABLE I. Summary of Results from Study of High-Creativity and Low-Creativity Projects at
High Tech Electronics International

<table>
<thead>
<tr>
<th>KEYS Scale Name</th>
<th>KEYS Scale Description</th>
<th>Direction of Difference</th>
<th>Magnitude of Difference in Phase 1</th>
<th>Magnitude of Difference in Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATIVITY STIMULANT SCALES</td>
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<tr>
<td>Organizational Encouragement</td>
<td>An organizational culture that encourages creativity through the fair, constructive judgment of ideas, reward and recognition for creative work, mechanisms for developing new ideas, an active flow of ideas, and a shared vision of what the organization is trying to do.</td>
<td>High-Creativity higher</td>
<td>Strongb</td>
<td>Strongb</td>
</tr>
<tr>
<td>Supervisory Encouragement</td>
<td>A supervisor who serves as a good work model, sets goals appropriately, supports the work group, values individual contributions, and shows confidence in the work group.</td>
<td>High-Creativity higher</td>
<td>Strongb</td>
<td>Moderateb</td>
</tr>
<tr>
<td>Work Group Supports</td>
<td>A diversely skilled work group in which people communicate well, are open to new ideas, constructively challenge each other's work, trust and help each other, and feel committed to the work they are doing.</td>
<td>High-Creativity higher</td>
<td>Strongb</td>
<td>Strongb</td>
</tr>
<tr>
<td>Sufficient Resources</td>
<td>Access to appropriate resources, including funds, materials, facilities, and information.</td>
<td>High-Creativity higher</td>
<td>Moderateb</td>
<td>None</td>
</tr>
<tr>
<td>Challenging Work</td>
<td>A sense of having to work hard on challenging tasks and important projects.</td>
<td>High-Creativity higher</td>
<td>Strongb</td>
<td>Strongb</td>
</tr>
<tr>
<td>Freedom</td>
<td>Freedom in deciding what work to do or how to do it; a sense of control over one's work.</td>
<td>High-Creativity higher</td>
<td>Strongb</td>
<td>Moderatec</td>
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</table>

stimulant scales, and significantly lower on the two work environment obstacle scales. (See Table 1.) In addition, the high-creativity projects were higher on the two outcome scales assessing creativity and productivity.

In Phase 2, the expert ratings confirmed the initial nominations made in Phase 1: the previously-nominated high-creativity projects were indeed rated significantly higher on creativity than the previously-nominated low-creativity projects.

Phase 3 confirmed most of the findings from Phase 1 (see Table 1). Analyses of the responses from project-team members showed that the high-creativity projects were significantly higher than the low-creativity projects on four of the six work environment stimulant scales, and marginally higher on a fifth work
### TABLE I. Summary of Results from Study of High-Creativity and Low-Creativity Projects at High Tech Electronics International (continued)

<table>
<thead>
<tr>
<th>KEYS Scale Name</th>
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<th>Direction of Difference in Phase 1</th>
<th>Magnitude of Difference in Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CREATIVITY SCALE</strong></td>
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<tr>
<td>Organizational Impediments</td>
<td>An organizational culture that impedes creativity through internal political problems, harsh criticism of new ideas, destructive internal competition, an avoidance of risk, and an overemphasis on the status quo.</td>
<td>Low-Creativity higher</td>
<td>Strong^b</td>
</tr>
<tr>
<td>Workload Pressure</td>
<td>Extreme time pressures, unrealistic expectations for productivity, and distractions from creative work.</td>
<td>Low-Creativity higher</td>
<td>Weak^b</td>
</tr>
<tr>
<td><strong>CRITERION SCALE</strong></td>
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</tr>
<tr>
<td>Creativity</td>
<td>A creative organization or unit, where a great deal of creativity is called for and where people believe they actually produce creative work.</td>
<td>High-Creativity higher</td>
<td>Strong^b</td>
</tr>
<tr>
<td>Productivity</td>
<td>An efficient, effective, and productive organization or unit.</td>
<td>High-Creativity higher</td>
<td>Strong^b</td>
</tr>
</tbody>
</table>

Notes:

a. "Strong" designates effect sizes (partial eta-squared) of .21-.54. "Moderate" designates effect sizes of .10-.20. "Weak" designates effect sizes of .05-.09. "None" designates effect sizes of less than .05.

b. Statistically significant.

c. Marginal (.06 < p < .15)

environment stimulant scale. In addition, the high-creativity projects were marginally lower on one of the two work environment obstacle scales. Finally, as in Phase 1, the high-creativity projects were higher on the two outcome scales assessing creativity and productivity.

Table 1 summarizes the work environment findings from Phases 1 and 3 of this study at High Tech Electronics International. Clearly, although all aspects of the work environment may exert influence, some appear to carry more weight in the differentiation between high- and low-creativity projects. Somewhat surprisingly, three dimensions seem to play a relatively less prominent role in organizational creativity: resources, workload pressure, and freedom. However, the differences between high- and low-creativity projects on five dimensions were striking. In particular, positive challenge in the work, organizational encouragement, work group supports, supervisory encouragement, and organizational impediments may play an important role in influencing creative
behavior in organizations. Thus, this study clearly indicates that the work environment within which people work relates significantly to the creativity of the work that they produce.

Other researchers have also discovered aspects of work environments that appear to affect creativity and innovation. Our tentative finding of the positive impact of freedom or autonomy echoes a result obtained in a study of 200 R&D managers in eight semi-conductor companies, where independence among R&D personnel was identified as a key determinant of success. Various organizational supports have likewise appeared in other findings. In a survey of 77 strategic business units, the presence of innovation norms emerged as the single most important predictor of the effectiveness of entrepreneurial strategy. Using a critical incidents methodology, another study examined the treatment of new ideas in high-technology and health-services organizations by gathering data from several hundred managers. Several features of successful innovations were identified, including: the earmarking of special funds for highly experimental research and development; the formal consideration of innovators' ideas, followed by feasibility studies; consideration of marketing issues in the early stages of decision-making about an idea; substantial modification of most original ideas prior to final adoption; adequate funding and consistent monitoring of such projects; and initial small-scale implementation of the new idea.

**How the Work Environment for Creativity Changes During Significant Organizational Events**

In another recent study, Regina Conti and I set out to determine how the environment for creativity and innovation might change in an organization that is undergoing rapid transition. Several months after our earlier study at High Tech Electronics International, the company's management announced a major (15-30%) downsizing. We returned and proceeded to collect KEYS data at three additional points in time: half-way through the downsizing, just as the downsizing had ended, and four months after the end of the downsizing. In addition, we conducted interviews with surviving employees at each of these three time periods. The results showed a striking pattern. All of the Environmental Stimulants to Creativity declined during the downsizing, but appeared to rebound as the downsizing came to an end. The most dramatic declines were seen in challenge, work group supports, and organizational encouragement—three of the dimensions which, according to the previous study, carry the most weight in differentiating between high and low creativity. Moreover, these same three dimensions showed the weakest rebound by four months after the downsizing ended. Although workload pressure remained unchanged during the downsizing, the Environmental Obstacle of organizational impediments increased significantly; however, this factor declined as the downsizing ended. Importantly, both creativity and productivity (as assessed by KEYS) declined during the downsizing; only productivity had rebounded to a significant degree by four months after the
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downsizing. In addition, potentially longer-term effects on creativity were sug-
gested by a decline in the per-capita invention disclosures logged by the com-
pany’s engineers during the downsizing. Invention disclosures are the first step
in patent applications and, in a company like High Tech Electronics, patents are
the lifeblood of its future innovative product streams.

Additional questionnaire and interview data collected as part of the
downsizing study allow some insight into mechanisms by which these negative
effects might have occurred. Surprisingly, the degree of actual downsizing that
people experienced in their own department did not relate strongly to their per-
ceptions of the work environment or to reported work behaviors. However,
regardless of how much downsizing had gone on in their own department, peo-
ple were less creative and reported poorer work environments when the stability
of their own work-group had been disrupted. Moreover, the degree of anticipated
downsizing strongly related to a large number of perceptions and behaviors. The
more downsizing that people expected in the coming months, the poorer the
work environment in the department, the lower the morale, and the less cre-
ative their approach to their work. However, even in those departments antici-
pating considerable downsizing, people responded more positively on all of these
dimensions when they felt that their own management was trustworthy, com-
municated honestly with them, and listened to their concerns.

The downsizing study suggests that, given the potentially devastating
effects on surviving employees’ motivation and creativity, managers should
attempt to avoid downsizing if possible. If that is not possible, they would do
well to carry it out in a timely fashion (thus reducing the negative effects of
anticipated downsizing), with good, clear, all-directional communication about
the reasons behind the action and the processes being used. Moreover, attention
should be paid to the stability of groups where a high level of creative productiv-
ity is desired. If those groups are disrupted by the downsizing, the new teams
might be helped by team-building interventions.

Research Summary

On the basis of our two studies at High Tech Electronics International,
we now know that the work environment within an organization—which is
strongly influenced by management at all levels—can make the difference
between the production of new, useful ideas for innovative business growth and
the continuance of old, progressively less useful routines. We also know that
management actions that result in significant changes within the organization,
such as downsizing, can have dramatic and potentially long-lasting effects on
creativity.

These results, as well as the results of many other studies, have led to a
comprehensive Componential Theory of Creativity and Innovation in Organiza-
tions.37 The aim of this theory is to adequately capture all of the major elements
influencing creativity and innovation within organizations. The organizational
theory is built on the foundation of the Componential Theory of Individual Creativity and incorporates that theory.

**The Componential Theory of Organizational Creativity and Innovation**

Figure 2 presents a simplified schematic diagram depicting the major elements of the componential theory, integrating individual creativity with the organizational work environment. The three upper circles in the figure depict the organizational components (features of the work environment) that are considered necessary for innovation. The three lower circles in the figure depict the components of individual creativity.

The central prediction of the theory is that elements of the work environment will impact individuals’ creativity (depicted by the solid arrow). The theory also proposes that the creativity produced by individuals and teams of individuals serves as a primary source for innovation within the organization (depicted by the dotted arrow). The most important feature of the theory is the assertion that the social environment (the work environment) influences creativity by influencing the individual components. Although the environment can have an impact on any of the components, the impact on task motivation appears to be the most immediate and direct. The three components of the organizational work environment include all aspects investigated in the study of high- and low-creativity projects at High Tech Electronics International, combined into conceptually coherent categories.

**Organizational Motivation to Innovate**

This component is made up of the basic orientation of the organization toward innovation, as well as supports for creativity and innovation throughout the organization. The orientation toward innovation must come, primarily, from the highest levels of management, but lower levels can also be important in communicating and interpreting that vision. In the studies at High Tech, this component was manifested in differences on Organizational Encouragement and (in the negative direction) Organizational Impediments. On the basis of these studies and work by other researchers, it appears that the most important elements of the innovation orientation are: a value placed on creativity and innovation in general, an orientation toward risk (versus an orientation toward maintaining the status quo), a sense of pride in the organization’s members and enthusiasm about what they are capable of doing, and an offensive strategy of taking the lead toward the future (versus a defensive strategy of simply wanting to protect the organization’s past position). The primary organization-wide supports for innovation appear to be mechanisms for developing new ideas; open, active communication of information and ideas; reward and recognition for creative work; and fair evaluation of work—including work that might be perceived as a “failure.” Notably, the organizational motivation toward inno-
Motivating Creativity in Organizations

**FIGURE 2.** Impact of the Organizational Environment on Creativity

Resources

- Management Practices
- Innovation
- Organizational Motivation

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Creativity Feeds Innovation

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Task Motivation

- Creativity
- Creativity Skills

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Expertise

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Individual/Team Creativity

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Work Environment

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Impact of the Organizational Environment on Creativity

Innovation includes the absence of several elements that can undermine creativity: political problems and "turf battles," destructive criticism and competition within the organization, strict control by upper management, and an excess of formal structures and procedures.41

**Resources**

This component includes everything that the organization has available to aid work in the domain targeted for innovation. In the studies at High Tech, it was manifested in differences on the Sufficient Resources scale and (in the negative direction) the Workload Pressure scale. These resources include a wide array...
of elements: sufficient time for producing novel work in the domain, people with necessary expertise, funds allocated to this work domain, material resources, systems and processes for work in the domain, relevant information, and the availability of training.\textsuperscript{42}

**Management Practices**

This component includes management at all levels, but most especially the level of individual departments and projects.\textsuperscript{43} In the High Tech studies, this component was represented by the Challenging Work, Work Group Supports, Supervisory Encouragement, and Freedom scales. Several earlier researchers and theorists have suggested that creativity and innovation are fostered by allowing a considerable degree of freedom or autonomy in the conduct of one's work\textsuperscript{44} although, as noted, the high-low creativity study at High Tech did not provide strong support for this assertion. Some earlier work has suggested the importance of appropriately matching individuals to work assignments, on the basis of both skills and interests, to maximize a sense of positive challenge in the work.\textsuperscript{45} Several aspects of project supervision appear to be important, starting with an ability to clearly set overall project goals while allowing procedural autonomy.\textsuperscript{46} In addition, project supervision is likely to foster creativity when it is marked by clear planning and feedback, good communication between the supervisor and the work group, and enthusiastic support for the work of individuals as well as the entire group.\textsuperscript{47} Finally, management practices for creativity include the ability to constitute effective work groups that represent a diversity of skills, and are made up of individuals who trust and communicate well with each other, challenge each other’s ideas in constructive ways, are mutually supportive, and are committed to the work they are doing.\textsuperscript{48}

**Implications for Management**

The Componential Theory of Creativity, and the research that underlies it, suggest a number of management implications concerning the motivation for creativity in business and the effect of the work environment on that motivation.

- Because human motivation is so complex and so important, the successful management of creativity for the next century must include management education about the types of motivation, their sources, their effects on performance, and their susceptibility to various work environment influences.
- We cannot hope to create a highly and appropriately creative workforce simply by "loading up" the intrinsic and the extrinsic motivators in the work environment, without paying attention to the type of extrinsic motivators and the context in which they are presented.
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• Because a positive sense of challenge in the work is one of the most important predictors of creativity, it is imperative to match people to work that utilizes their skills, stretches their skills, and is clearly valued by the organization. As much as possible, all work should be designed to maximize intrinsically motivating aspects.

• Organizations must demonstrate a strong orientation toward innovation, which is clearly communicated and enacted, from the highest levels of management, throughout the organization.

• Organizations should orient themselves toward the generation, communication, careful consideration, and development of new ideas. This includes fair, constructive judgment of ideas, non-controlling reward and recognition for creative work, mechanisms for developing new ideas, and an active flow of ideas. It excludes turf battles, conservatism, and excessively negative criticism of new ideas.

• Work groups should be constituted of diversely skilled individuals with a shared intrinsic motivation for their work and a willingness to both share and constructively criticize each other's ideas. These groups should be led by supervisors who clearly set overall goals for projects but allow operational autonomy in achieving those goals. Performance feedback should be highly informational and work-focused.

• People should be given at least adequate resources to carry out their work, and at least minimally sufficient time to consider alternative approaches.

Organizational leaders and managers must begin to think of human motivation at work as a complex system where it is possible to achieve synergy between persons and their work environments, and between the different types of motivation. The system is complex, but it is not unknowable. We already know much about how to nurture the motivation for creativity, and we are learning more every day.

Summary

Maintaining your own creativity in your work depends on maintaining your intrinsic motivation. This means two things. You should do what you love, and you should love what you do. The first is a matter of finding work that matches well with your expertise, your creative thinking skills, and your strongest intrinsic motivations. The second is a matter of finding a work environment that will allow you to retain that intrinsic motivational focus, while supporting your exploration of new ideas.

Managers who learn these lessons will recruit for people who already have that spark of passion for their work (as well as the requisite skills and experience), but they will also nurture that spark by creating a work environment
that downplays the obstacles and fosters the stimulants to creativity. Only then will their organizations be poised to lead through innovation.

Notes

4. Importantly, it has been found that innovation within organizations has additional benefits aside from the creation of new products, services, and processes. In a study of 288 bank employees, the degree of innovation within a group was a significant negative predictor of turnover among employees in the group. M. McFadden and E. Demetriou, "The Role of Immediate Work Environment Factors in the Turnover Process: A Systemic Intervention," Applied Psychology: An International Review, 42 (1993): 97-115. In a similar study of 314 nurses, job satisfaction was significantly predicted by innovation. S.E. Robinson, S.L. Roth, and L.L. Brown, "Morale and Job Satisfaction among Nurses: What Can Hospitals Do?" Journal of Applied Social Psychology, 23 (1993): 244-251.
10. See Amabile (1996), op. cit.
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27. Deci and Ryan (1985) op. cit..

28. Ibid.

29. Amabile et al. (1996), op. cit.

30. T.M. Amabile, KEYS: Assessing the Climate for Creativity (Greensboro, NC: Center for Creative Leadership, 1995).

31. KEYS was developed on the basis of several earlier studies of the work environment for creativity, in particular a critical-incidents study of 120 R&D scientists. Amabile and Gryskiewicz, op. cit.

32. Amabile et al. (1996) op. cit.


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38. Ibid.


41. Amabile and Gryskiewicz, op. cit.

42. Ibid.

43. This component was termed "skills in innovation management" in the original presentation of the model. Amabile (1988), op. cit..


45. Amabile and Gryskiewicz, op. cit.


47. Amabile and Gryskiewicz, op. cit.
