

Creativity

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Creativity results from the interaction of system composed of three elements: a culture that contains symbolic rules, a person who brings novelty into the symbolic domain, and a field of experts who recognize and validate the innovation. All three are necessary for a creative idea, product, or discovery to take place.

In the current historical climate, a domain where quantifiable measurement is possible takes precedence over one where it does not. We believe that things can be measured are real, and we ignore those that we don't know how to measure.

In other words, no person can afford to pay attention to more than a very small fraction of new things produced. Yet a culture could not survive long unless all of its members paid attention to at least a few of the same things. In fact it could be said that a culture exists when the majority of people agree that painting X deserves more attention than painting Y, or idea X Deserves more thought than idea Y.

Because of the scarcity of attention, we must be selective: We remember and recognize only few of the books written, we buy only a few of the new appliance busily being invented. Usually it is the various fields that act as filters to help us select among the flood of new fields that act as filters to help us select among the flood of new information those memos worth paying attention to. A field is made up of experts in a given domain whose job involves passing judgment on performance in that domain. Members of the field choose from among the novelties those that deserve to be included in the canon. This competition also means that a creative person must convince the field that he or she has made a valuable innovation. This is never an easy task.

A person who wants to make a creative contribution not only must work within a creative system but must also reproduce that system within his or her mind. In other words, the person must learn the rules and the content of the domain, as well as the criteria of selection, the preferences of the field.

And then you must have the ability to get rid of the trash, which you think of. You cannot think only of good ideas, or write only beautiful music. You must think of a lot of music, a lot of ideas, a lot poetry, a lot of whatever. And if you're good, you must be able to throw out the junk immediately without even saying it. In other words, you get many ideas appearing and you discard them because you're well trained and you say, "that's

junk.” And when you see the good one, you say, “Oops, this sounds interesting. Let me pursue that a little further.” And you start developing it.

Problems are not all alike in the way they come to a person’s attention. Most problems are already formulated; everybody knows what is to be done and only the solution is missing. The person is expected by employers, patrons, or some other external pressure to apply his or her mind to the solution of a puzzle. These are “presented” problems. But there are also situations in which nobody has asked the question yet, nobody even knows that there is a problem. In this case the creative person identifies both the problem and the solution. Here we have a “discovered” problem.

There is a balance between challenges and skills. In flow, we feel that our abilities are well matched to the opportunities for action. In everyday life we sometimes feel the challenges are too high in relation to our skills, and then we feel frustrated and anxious. Or we feel that our potential is greater than the opportunities to express it, and then we feel bored. Playing tennis or chess against a much better opponent leads to frustration; against a much weaker opponent, to boredom. In a really enjoyable game, the players are balanced on the fine line between boredom and anxiety. The same is true when work, or a conversation, or relationship is going well.

Action and awareness are merged. It is typical of everyday experience that our minds are disjointed from what we do. Sitting in class, students may appear to be paying attention to the teacher, but they are actually thinking about lunch, or last night’s date. The worker thinks about the weekend; the mother cleaning house is worried about her child; the golfer’s mind is preoccupied with how his swing looks to his friends. In flow, however, our concentration is focused on what we do. One-pointedness of mind is required by the close match between challenges and skills, and it is made possible by the clarity of goals and the constant availability of feedback.

Distractions are excluded from consciousness. Another typical element of flow is that we are aware only of what is relevant here and now. If the musician thinks of his health or tax problems when playing, he is likely to hit a wrong note. If the surgeon’s mind wanders during an operation, the patient’s life is in danger. Flow is the result of intense concentration on the present, which relieves us of the usual fears that cause depression and anxiety in everyday life.

There is no worry of failure. While in flow, we are too involved to be concerned with failure. Some people describe it as a feeling of total control; but actually we are not in control, it’s just that the issue does not even come up. If it did, we would not be concentrating totally, because our attention would be split between what we did and the feeling of control. The reason that failure is not an issue is that in flow it is clear what has to be done, and our skills are potentially adequate to the challenges.

Self-consciousness disappears. In everyday life, we are always monitoring how we appear to other people; we are on the alert to defend ourselves from potential slights and anxious to make a favorable impression. Typically this awareness of self is a burden. In

flow we are too involved in what we are doing to care about protecting the ego. Yet after an episode of flow is over, we generally emerge from it with a stronger self-concept; we know that we have succeeded in meeting a difficult challenge. We might even feel that we have stepped out of the boundaries of the ego and have become part, at least temporarily, of a larger entity. The musician feels at one with the harmony of the cosmos, the athlete moves at one with the team, the reader of a novel lives for a few hours in a different reality. Paradoxically, the self expands through acts of self-forgetfulness.

The sense of time becomes distorted. Generally in flow we forget time, and hours may pass by in what seem like a few minutes. Or the opposite happens: A figure skater may report that a quick turn that in real time takes only a second seems to stretch out for ten times as long. In other words, clock times no longer marks equal lengths of experienced time: our sense of how much time passes depends on what we are doing.

The activity becomes autotelic. Whenever most of these conditions are present, we begin to enjoy whatever it is that produces such an experience. I may be scared of using a computer and learn to do it only because my job depends on it. But as my skills increase, and I recognize what the computer allows me to do, I may begin to enjoy using the computer for its own sake as well. At this point the activity become autotelic, which is Greek for something that is an end in itself. Some activities such as art, music, and sports are usually autotelic: There is no reason for doing them except to feel the experience they provide. Most things in life are exotelic. We do them not because we enjoy them but in order to get at some later goal. And some activities are both: The violinist gets paid for playing, and the surgeon gets status and good money for operating, as well as getting enjoyment from doing what they do. In many ways, the secret to a happy life is to learn to get flow from as many of the things we have to do as possible. If work and family life become autotelic, then there is nothing wasted in life, and everything we do is worth doing for its own sake.

The solution seems to be that those individuals who keep doing creative work are those who succeed in internalizing the field's criteria of judgment to the extent that they can give feedback to themselves, without having to wait to hear from experts.

The second reason why a place may help creativity is that novel stimulation is not evenly distributed. Certain environments have a greater density of interaction and provide more excitement and a greater density of interaction and provide more excitement and a greater effervescence of ideas; therefore, they prompt the person who is already inclined to break away from conventions to experiment with novelty more readily than if he or she had stayed in a more conservative, more repressive setting.

How one spends time in a beautiful natural setting seems to matter as well. Just sitting and watching is fine, but taking a leisurely walk seems to be even better. The Greek philosophers had settled on the peripatetic method-they preferred to discuss ideas while walking up and down in the courtyards of the academy.

When involved in a semiautomatic activity that takes up a certain amount of attention, while leaving some of it free to make connections among ideas below the threshold of conscious intentionality. Devoting full attention to a problem is not the best recipe for having creative thoughts.

While a complex, stimulating environment is useful for providing new insights, a more humdrum setting may be indicated for pursuing the bulk of the creative endeavor—the much longer periods of preparation that must precede the flash of insight, and the equally long periods of evaluation and elaboration that follow. Do surrounding matter during these stages of the creative process?

The important thing, however, is to have a special space tailor-made to one's own needs, where one feels comfortable and in control.

Wherever she goes, she takes a familiar microenvironment with her.

Psychologists have long made distinction between two broad types of mental abilities. The first is what they call fluid intelligence, or the ability to respond rapidly, to have quick reaction times, to compute fast and accurately. This ability is measured by tests asking a person to remember strings of numbers or letters, recognize patterns embedded in more complex figures, or draw inferences from logical or visual relationships. This type of intelligence is supposedly innate and little affected by learning. Its various components peak early on some tests it is teens who perform best, on some others it is twenty- or thirty-year-olds. Each later decade shows some decrease in these skills, and after age seventy the decline is usually quite severe even among otherwise healthy individuals.

The second type of mental ability is known as crystallized intelligence. It is more dependent on learning than on innate skills. It involves making sensible judgments, recognizing similarities across different categories, and using induction and logical reasoning. These abilities depend more on reflection than quick reaction, and they usually increase with time, at least until sixty years of age. In our sample of creative individuals, it is this kind of mental ability that is supposed to be improving, or at least staying stable, even in the ninth decade of life.

Wisdom and integrity cannot be found in any single domain. A broader viewpoint that breaks across disciplinary boundaries is needed, a way of understanding this task one cannot expect to succeed in the public eye, as one can when a field of culture recognizes one's contributions to art, business, or science. But by this time a person aspiring to wisdom knows that the bottom line of well-lived life is not so much success but the certainty we reach, in the most private fibers of our being, that our existence is linked in a meaningful way with the rest of the universe.

Among the oldest symbolic systems in the world are those organized around the content and the rules of language. The first narrative stories telling of real or imaginary events, the myths and campfire tales of our time through imagination. The rhyme and meter of poetry

created patterns of order that must have seemed miraculous to people who had yet scarcely learned to improve on the precarious to preserve memory outside the fragile brain, the domain of the word became one of the haps only art, dance, and music are more ancient; the beginnings of technology and arithmetic probably contemporaneous.

What makes words so powerful is that they enrich life by expanding the range of individual experience. Without stories and books, we would be limited to knowing only what has happen to us or to those whom we have met. With books we can join Herodotus during his travel to Egypt, or be with Lewis and Clark in their epic journey to the Pacific, or imagine what it might be like to travel beyond our galaxy a few hundred years hence. But more important, the written word allows us to understand better what is happening within ourselves. In recording real or imaginary events, the writer arrests the evanescent stream of experience by naming its aspects and making them enduring in language. Then by reading and repeating a verse or passage of prose, we can savor the images and their meanings and thus understand more accurately how we feel and what we think. Fragile thoughts and feelings are transformed by words into concrete thoughts and emotions, In this sense, poetry and literature allow the creation of experiences that we would otherwise not have access to; they take our lives to higher levels of complexity.

Creativity generally refers to the act of changing some aspect of a domain-to a painting that reveals new ways of seeing, to an idea that explains how stars move and why. None started out on a new course in order to achieve personal advancement, power, or money. A deep concern for the well being of the world informs their lives.

How does one rewrite the DNA of any organization, let alone the entire planet? It is at this point that the really hard work begins. It would be tempting just to bask in the glory of having found a conceptual model for beginning to solve some of the world's worst problems and let others implement it, if they can.

To achieve the kind of world we consider human, some people had dare to break the thrall of tradition. Next, they had to find ways of recording those new ideas or procedures that improved on what went on before. Finally, they had to find ways of transmitting the new knowledge to the generations to come. Those who were involved in this process we call creative. What we call culture, or those parts of our selves that we internalized from the social environment, is their creation.

What is needed is a self-conscious effort to establish priorities and to use something like an "evolutionary impact analysis" as one of the bases for the social endorsement of new ideas.

The greatest art, East or West, was not produced when the artists set the agenda, but when patrons insisted on certain standards that benefited them. Patrons wanted primarily to be admired by the public, so the art they demanded had to appeal to and impress the entire community.

No matter how gifted a person is, he or she has no chance to achieve anything creative unless the right conditions are provided by the field. And what might these conditions be? In terms of what we have learned from this study, it is possible to single out seven major elements in the social milieu that help make creative contributions possible: training, expectations, resources, recognition, hope, opportunity, and reward. Some of these are direct responsibilities of the field, others depend on the broader social system. If our argument is correct, then the creativity can be substantially increased by making sure that society provides the opportunities more widely.

Linguistic obfuscation is only one means by which domains become isolated. The more general problem is that each domain is becoming increasingly specialized not only in its vocabulary but also in the conceptual organization of its rules and procedures.

It is easier to position to an established cannon. Conversely, when aesthetic criteria become fragmented and largely idiosyncratic, as they have become since World War I, it is more difficult to be sure whether a new painting or piece of music deserve to be remembered and passed on to the next generation or whether it is just a novelty to be forgotten as soon as possible.

Similarly, it should be easier to tell whether a new way of doing things is better than the old in mathematics, which is an extremely coherent domain; it would be slightly more difficult in physics, and even more so in biology and economics; it would be most difficult in the other social science and philosophy, which are not as tightly connected by an internal network of laws. When the domain is not strictly integrated by logical rules, it is difficult for the field to judge whether novelty is valuable, and thus whether it should be included in the domain.

The origins of culture can easily be explained by necessity. Technology, science, even the arts were defensive adaptations our ancestors discovered to improve their chances of survival, or in order to increase their comfort.

Try to be surprised by something every day. It could be something you see, hear, or read about. Stop to look at the unusual car parked at the curb, taste the new item on the cafeteria menu, actually listen to your colleague at the office. How is this different from other similar cars, dishes, or conversation? What is its essence? Don't assume that you already know what these things are all about, or that even if you knew them, they wouldn't matter anyway. Experience this one thing for what it is, not what you think it is. Be open to what the world is telling you. Life is nothing more than a stream of experiences-the more widely and deeply you swim in it, the richer your life will be.

Try to surprise at least one person every day. Instead of being your predictable self, say something unexpected, express an opinion that you have not dared to reveal, ask a question you wouldn't ordinarily ask. Or break the routine of your activities: Invite a person to go with you to a show, a restaurant, or a museum that you never visited before. Experiment with your appearance. Comfortable routines are great when they save energy for doing what you really care about; but if you are still searching, they restrict and limit the future.

Write down each day what surprised you and how you surprised others. Most creative people keep a diary, or notes, or lab records to make their experiences more concrete and enduring. If you don't do so already, it might help to start with a very specific task: to record each evening the most surprising event that happened that day and your most surprising action. This is a simple enough assignment and one you will find is fun to do. After a few days, you can reread what you have written and reflect on those past experiences. One of the surest ways to enrich life is to make experiences less fleeting, so that the most memorable, interesting, and important events are not lost forever a few hours after they occurred. Writing them down so that you can relive them in recollection is one way to keep them from disappearing. And after a few weeks, you may begin to see a pattern of interest emerging in the notes, one that may indicate some domain that would repay exploring in depth.

They try to enhance three dimensions of divergent thinking that are generally held to be important to creativity: fluency, or the knack for coming up with a great number of responses; flexibility, or the tendency to produce ideas that are different from each other; and originality which refers to the relative rarity of the ideas produced.

Produce as many ideas as possible. If you have to write a thank-you note, a report, or a letter, identify a key word and then try to generate as many synonyms for it as possible. If you get stuck, turn to a thesaurus. Or instead of words that means the same thing, shift to meaning that are similar but lead in different directions. At first go for quantity; later you will be critical and edit for quality. Have as many different ideas as possible. Quantity is important, but try to avoid redundancy. Try to produce unlikely ideas. Originality is one of the hallmarks of creative thinking. If asked to come up with names for a baby, or ways to use a paper clip, or things to do at a party, a creative person is likely to give answers that are different from the answer of the majority.