

Chapter 4

Society, Culture, and Person: A Systems View of Creativity

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The Constitution of Creativity

It is customary to date the renewal of interest in creativity among psychologists to Guilford's presidential address to the APA more than 30 years ago (Guilford 1950). Ever since that date, an increasing tide of publications on the subject has been appearing in our journals. Many of these books and articles have tried to answer what has been thought to be the most fundamental question: *What* is creativity? But no one has raised the simple question that should precede attempts at defining, measuring, or enhancing, namely: *Where* is creativity?

On hearing this question, most people would answer "Why, in the creative person's head, of course". Others might demur at such a subjective location and say that creativity is in the thought, object, or action produced by the person. At any rate, all of the definitions of creativity of which I am aware assume that the phenomenon exists, as a concrete process open to investigation, either inside the person or in the works produced.

After studying creativity on and off for almost a quarter of a century, I have come to the reluctant conclusion that this is not the case. We cannot study creativity by isolating individuals and their works from the social and historical milieu in which their actions are carried out. This is because what we call creative is never the result of individual action alone; it is the product of three main shaping forces: a set of social institutions, or *field*, that selects from the variations produced by individuals those that are worth preserving; a stable cultural *domain* that will preserve and transmit the selected new ideas or forms to the following generations; and finally the *individual*, who brings about some change in the domain, a change that the field, will consider to be creative.

So the question "Where is creativity?" cannot be answered solely with reference to the person and the person's work. Creativity is a phenomenon that results

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from interaction between these three systems, Without a culturally defined domain of action in which innovation is possible, the person cannot even get started. And without a group of peers to evaluate and confirm the adaptiveness of the innovation, it is impossible to differentiate what is creative from what is simply statistically improbable or bizarre.

Three colleagues from three different generations have been especially helpful in developing the ideas in this chapter. J.W. Getzels, who inspired me to the study of creativity, has always been a source of fresh insights and strong values. Howard Gardner, as stimulating and generous a colleague as one might wish for, sharpened the thoughts in this chapter through the numerous conversations we have had over the years. And so did Rick Robinson, who is standing out now on the long journey of scholarship.

The importance of this distinction is shown by the muddle that people who ignore it are prone to get into. For instance, Herbert Simon (1985), in his 1985 address to the APA, made the claim that his computer program BACON could replicate the solutions of some of the most creative problems in science—such as the derivation of Kepler’s and Newton’s laws—and therefore it should be considered to have the attribute of “creativity” (Csikszentmihalyi 1986). His conclusion would follow if one were to accept the premise, clearly articulated by Simon, that if an object or idea A is undistinguishable from another object or idea B, and if we agree that B is creative, then it follows that A must be creative too. This argument might work in the domain of logic, but it does not apply in the empirical world, where creativity exists only in specific social and historical contexts.

To see the weakness in Simon’s argument, we need only to consider the case of a forger who can exactly reproduce some painting that we have agreed to recognize as creative—one originally painted by, let us say, Rembrandt. The two canvases, the original and the forgery, are completely indistinguishable. Does it follow from this identity between the two products that Rembrandt and the forger are equally creative, or that the, two paintings are equally creative? If we say yes, then there is no more point in talking about creativity.

My argument, of course, is that the two paintings may be of equal technical skill, of the same aesthetic value, but they cannot be considered to be equal in creativity. Rembrandt’s work is creative because he introduced some variations in the domain of painting at a certain point in history, when those variations were novel, and when they were instrumental in revising and enlarging the symbolic domain of the visual arts. The very same variations a few years later were no longer creative, because then they simply reproduced existing forms. The same argument applies to BACON and to any other procedure that replicates a creative achievement.

It is impossible to tell whether or not an object or idea is creative by simply looking at it. Without a historical context, one lacks the reference points necessary to determine if the product is in fact an adaptive innovation. An unusual African mask might seem the product of creative genius, until we realize that the same mask has been carved exactly the same way for centuries. A complex mathematical equation

that purports to explain teleportation might impress the layman, but be recognized as pure gibberish by the mathematically trained.

I realized only recently, after writing for over two decades about creativity, that I had never “seen” it. Of course, like most people, I have been exposed to many objects and ideas that we call creative. Some of these might have been arresting, or interesting, or impressive, but I cannot say that I ever thought of them as “creative”. Their creativity is something that I came to accept later, if at all, after comparing the object or idea with others of its kind, but mostly because I had been told by experts that these things were creative.

When I was a young child, we lived for a while in Venice, a few steps from St. Mark’s Square, in a spot where the density of original works of art is one of the highest in the world. Later we moved to Florence, and every morning I walked past Brunelleschi’s elegant Foundling Hospital with its priceless round Della Robbia ceramics. As a teenager I lived on the Gianicolo Hill in Rome, overlooking Michelangelo’s great dome. During this time, my father, a redoubtable amateur art historian made sure to point out to me the flowering of Renaissance creativity that surrounded us, I believed him, but I must confess that those masterpieces by and large made no impression on me. Some of them did produce an uncanny sense of serenity; others conveyed a great sense of power, or an undefinable excitement. But creativity? The great breakthroughs of Western art all looked equally old and decrepit to me; to think of them as innovations seemed a silly convention. I am afraid that in those years I would have gladly exchanged Giotto’s frescoes in the Scrovegni Chapel for some Donald Duck comics illustrated by Walt Disney.

One might ask what this proves—only that I was ignorant and that it requires a certain amount of sophistication to recognize genuine creativity. I grant my ignorance, but I beg to raise what I think is an important point: Where does the information that gives us the ability to make sophisticated judgments come from? The information does not seem to be in the object itself. If we think about it, the reason we believe that Leonardo or Einstein was creative is that we have read that that is the case, we have been told it is true; our opinions about who is creative and why ultimately are based on faith. We have faith in the domains of art and science, and we trust the judgment of the field, that is, of the artistic and scientific establishments.

There is nothing wrong with this, because it is an inevitable situation. But by recognizing it, we must also accept some of its consequences, namely, that any attribution of creativity must be relative, grounded only in social agreement. And from this it also follows that social agreement is one of the constitutive aspects of creativity, without which the phenomenon would not exist.

It is easiest to see this process in art, where the selection criteria of the field change rather erratically. Kermode (1985) tells how Botticelli was for centuries considered to be a coarse painter, and the women he painted “sickly” and “clumsy”. Only in the mid-nineteenth century did some critics begin to reevaluate his work and see in it creative anticipations of modern sensibility. To what extent was creativity contained in Botticelli’s canvases, and to what extent did it emerge from the interpretive efforts of critics like Ruskin? One might argue that Botticelli’s creativity was constituted by Ruskin’s interpretations, that without the latter

the former would not exist, and hence that Ruskin and the other critics and viewers who have since looked closely at Botticelli's work are just as indispensable to Botticelli's creativity as was the painter himself.

Similar situations abound in the history of art. In his lifetime, Rembrandt was thought to be a less important painter than Jan Lievens, who was also working at the same time in Amsterdam. How many people know of Lievens now? The powerful canvases of Francisco de Zurbarán were eagerly sought after in the royal court of Madrid until around 1645, when Murillo began to show his more graceful and lively paintings; after a few years Zurbarán was forgotten, and later died in poverty (Borghero 1986). To understand creativity, it seems necessary to know how the attributions of creativity are made. By what process does Rembrandt emerge as more creative than Lievens?

The notoriously fickle realm of the arts is by no means the only one in which social processes determine what is and what is not to be considered creative. As Kuhn (1970, 1974) has noted, the same forces are at work in the hard sciences. In the domains of physics and chemistry, in the domain of mathematics, originality is attributed by social processes that are relative and fallible and that sometimes are reversed by posterity.

Augustine Brannigan (1981) has reviewed several instances of scientific discoveries in which retrospective reinterpretation was at least as important as the original contribution had been. For example, he makes an interesting case to the effect that our view of Mendel's contribution to genetics is generally quite wrong. The impression we have is that Mendel made a series of epochal experiments in the genetic transmission of traits in the 1860s, but that his creativity was not recognized by the scientific community until about 40 years later. This view, according to Brannigan, is radically mistaken in a subtle but essential respect. He argues that Mendel's experiments were not and could not have been contributions to genetics at the time they were made. Their implications for the theory of variation and natural selection were discovered only in 1900 by William Bateson and other evolutionists looking for a mechanism that explained discontinuous inheritance. Within their theoretical framework, Mendel's work suddenly acquired an importance that it had lacked before, even in the mind of Mendel himself. So where was Mendel's creativity? In his mind, in his experiments, or in the use his results were put to by later scientists? The answer, it seems to me, must be that it is to be found in all three. Just as the interpretations of Ruskin and other critics are inseparable from Botticelli's creativity, so the interpretations of Bateson and his fellows are constitutive parts of Mendel's creativity.

Brannigan forces us to see how even ostensibly simple facts, such as what is or is not a "discovery", are really the results of social processes of negotiation and legitimation. Most people would agree, for instance, that Columbus discovered America. But what does "discovery" mean in this context? Certainly it does not mean that he was the first man to set foot on the shores of the Western Hemisphere. Nor did it mean that Columbus knew that he had found a new continent previously unknown to Europeans; until the end he was convinced he had landed in Asia.

It means, as Brannigan shows, that he was the man for whom the field that could legitimize such things (which in his case included the Spanish crown, its royal commission, and various scholars and cartographers) was willing to make a claim of discovery. Not until Vespucci recognized that the so-called West Indies were part of an entirely different continent did Columbus's almost superhuman efforts get retrospectively revised as a "discovery". And if in the fullness of time it turns out that it was Erik the Red who really discovered America, that "discovery" will be as much a result of scholarship and politics as a result of Erik's travels.

A Dynamic Model of the Creative Process

One way to represent the set of relationships that constitute creativity is through the "map" provided in Fig. 4.1. It is important to realize that the relationships shown in the figure are dynamic links of circular causality. In other words, each of the three main systems—person, field, and domain—affects the others and is affected by them in turn. One might say that the three systems represent three "moments" of the same creative process.

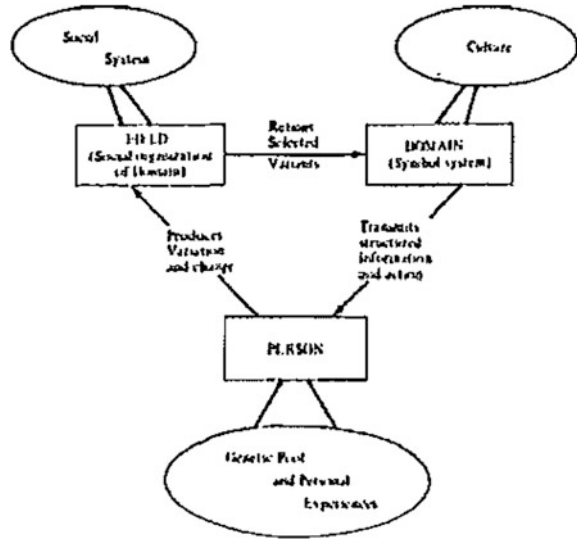
The starting point on this map is purely arbitrary. One might start from the "person", because we are used to thinking in these terms—that the idea begins, like the lighted bulb in the cartoon blurb, within the head of the creative individual. But, of course, the information that will go into the idea existed long before the creative person arrived on the scene. It had been stored in the symbol system of the culture, in the customary practices, the language, the specific notation of the "domain." A person who has no access to this information will not be able to make a creative contribution, no matter how able or skilled the person otherwise is. One needs to know music to write a creative symphony. It is difficult to become recognized as a creative Mandarin chef without knowing quite a bit about Chinese cooking.

A corollary of this relationship is that depending on the structure of the domain, it might be either relatively easy or more difficult for a person to innovate. The more precise the notation system, the easier it is to detect change and hence to evaluate whether or not the person has made an original contribution. Other things being equal, it should be easier to establish creativity in mathematics, music, or physics than, say, philosophy, the visual arts, or biology.

But returning to the system "person", we see that its contribution to the creative process is to produce some variation in the information inherited from the culture.

The source of the variation might be an inherited or learned cognitive flexibility, a more dogged motivation, or some rare event in the life of the person. Of course, this is the aspect of the process that almost all psychologists interested in creativity have been studying—unfortunately, this usually is the only aspect studied. And by itself, the process of generating variation will not reveal what creativity is about. The reason is that focusing on the individual out of context does not allow the observer to evaluate the variation produced. It has been said that

Fig. 4.1 The focus of creativity. This “map” shows the interrelations of the three systems that jointly determine the occurrence of a creative idea, object, or action. The individual takes some information provided by the culture and transforms it, and if the change is deemed valuable by society, it will be included in the domain, thus providing a new starting point for the next generation of persons. The actions of all three systems are necessary for creativity to occur



99 % of all new ideas are garbage, regardless of the domain or the status of the thinker. To sift out the good ideas from the bad, another system is needed.

It is the task of the “field” to select promising variations and to incorporate them into the domain. The easiest way to define a field is to say that it includes all those persons who can affect the structure of a domain. Thus, the field of art includes the following: art teachers and art historians, because they pass on the specialized symbolic information to the next generation; art critics, who help establish the reputation of individual artists; collectors, who make it possible for artists and works of art to survive; gallery owners and museum curators, who preserve and act as midwives to the production of art; and, finally, the peer group of artists whose interaction defines styles and revolutions of taste.

Thus, the field of art, like any other field, is made up of a network of interlocking roles. Some of them have a better chance than others of incorporating a selected variation into the domain. The people who fill these privileged roles act as “gatekeepers” to the domain. For instance, in a field like nuclear physics, the conviction of a thousand high school physics teachers that a new idea is pure genius probably would not be enough to get the new idea into the journals and textbooks that define the domain, whereas the same conviction held by half a dozen Nobel Prize winners might do it. During the Renaissance, the attention of a pope, or his mistress, was enough to select out the work of a young artist and slate it for preservation; once preserved, the work becomes part of the canon and will filter through, as one item of information in the domain, so that following generations of artists can be inspired to imitate it or reject it.

It goes without saying that fields will differ in the stringency of their selective mechanisms, the sensitivity of their gatekeepers, and the dynamics of their inner organization. The fields of botany and genetics in the USSR had only one

gatekeeper for almost a generation, and his criteria of selection were based more on ideology than biology (Lecourt 1977; Medvedev 1971). Critics complain that the fate of American art is decided by only ten thousand inhabitants of Manhattan, but compared with most of the past stages of Western civilization, during which a few princes and bishops held the keys of artistic survival, this is a huge field.

It also follows that a field with fuzzy selection criteri, or one with gatekeepers who are not highly respected, will have great difficulty in establishing the creativity of a new idea. Similarly, but for opposite reasons, a new idea will face difficulties in being recognized as creative if the field is defensive, rigid, or embedded in a social system that discourages novelty. For instance, the aridity of Soviet genetics in the thirties was not, strictly speaking, a fault of the scientists who made up the field, but of the peculiar agenda of the broader social system of which the field was a part.

Every field is embedded in a specific social system. The resources of the larger society help to support tile recognition of new ideas. The flowering of new ideas in Athens in the fifth century BC, or in fifteenth-century Florence, nineteenth-century Paris, or twentieth-century Vienna and New York, was due in large part to the fact that these centers at those times were in the position to pay attention to an unusually great number of new ideas. What does it take for a community to be able to do so? To a certain extent the materialist explanation applies: Disposable wealth is one of the conditions that makes the selection of novelty possible. In addition, it takes disposable attention—people who in addition to being wealthy have the time to take an interest in the domain (Csikszentmihalyi 1978, 1979). A hundred years ago, every aspiring artist in Europe dreamed of being in Paris, where the field of art had the greatest financial clout, as well as being numerically the largest and most sophisticated. It is sobering to remember that even the great Leonardo, that most protean of all known creators, timed his moves to the tides of his patrons' fortunes. As soon as Sforza started spending lavishly, he left Florence for the ducal court in Milan; when the pope became more solvent than the duke, he moved to Rome; he went back and forth between the two Italian courts, but when the finances of King Francis I began to outshine those of both, he packed up for France.

Occasionally, great creative reformulations appear to take place outside of all constituted fields. Gardner (1986) makes this case for Freud: Essentially, he invented psychoanalysis, and at the time he did so there was no social organization specifically qualified to support or suppress his ideas. In a certain sense, the founders of all great systems are in the same position: Galileo may be said to have started the field of experimental physics, and at the time of the Wright brothers there was no field of aeronautics. What happens in such cases is that a subset of people from related fields recognize the validity of the new variation and become identified with the emerging field. In the case of Galileo, it was mathematicians, astronomers, and philosophers who were attracted to his ideas; in the case of the Wright brothers, it was automobile and bicycle mechanics; Freud's first followers were other medical men.

But the model suggests that without people in neighboring fields who become attracted to the new idea, the creative process will be aborted. If no qualified persons are willing to invest their energy in preserving the variation, it will not become one of the “memes” that future generations will know about. In a setting with not enough mechanics interested in flying, the Wrights’ efforts would eventually have been forgotten, and aeronautics would not have developed.

The Element of Time in the Constitution of Creativity

In looking again at the complex dynamics represented in Fig. 4.1, it should be clear that time plays an important role in the creative process. It is here that the folk view of the creative idea as a bolt of lightning is least realistic. First of all, an important breakthrough usually follows a long period of gestation in the domain. The atomic theory of matter existed, in embryonic form, 25 centuries before it was given its first satisfactory shape. Medical advances, engineering triumphs, and artistic revolutions typically exist for a long time as unclearly formulated possibilities. During this period of gestation, new converts to the field become imbued by its “problematics”. Occasionally there seems to be a discovery that truly comes from nowhere: Roentgen’s discovery of radiation and Fleming’s discovery of penicillin usually are held to be accidental. But they appear to be accidents only if we abstract the creative person from the context. The behavior of electric current in a cathode tube and the effects of various substances on bacterial cultures were problems that existed in Roentgen’s and Fleming’s respective domains; we might perhaps even say that they provided an implicit tension, a demand for resolution that exerted an invisible pull on workers in the field. If Roentgen and Fleming had not been sensitive to these potentialities in their work, no amount of lucky accidents would have produced a discovery.

It is not only in the transition from the domain to the person but also in the move from the person to the field, and from the field back to the domain, that time is involved. The only way to establish whether or not something is creative is through comparison, evaluation, and interpretation. Sometimes, as we have seen, the field reverses its judgment: Botticelli moves to the forefront, and Lievens fades into the background; Mendel is hailed a genius, and Lysenko is revealed a fake.

And once the field makes up its collective mind—at least temporarily—it takes a while for the new idea to be included into the canon of the domain. Given current technology and the highly rationalized organization of most fields, this time lag is shorter than at some times in the past. But it has been estimated that it still takes an average of 7 years for a bona fide new discovery to make its first appearance in the textbooks of most domains. This process is faster or slower depending on the structure of the domain and of the field.

I know a particle physicist of great renown who likes to tell a story about an advanced seminar he has taught in Munich, where one of the students once interrupted his blackboard demonstration and jotted down a formulation of the equation

different from the formulation he had been developing. The student's version appeared to be more elegant and suggestive than the professor's had been. The story goes that in a matter of weeks, every theoretical physicist in Germany knew of the event, and within a month, physicists on the West Coast of the United States were toying with the new equation. Eventually the student got himself a Nobel Prize.

Such a denouement would be impossible in most other disciplines. It could never happen, for instance, in psychology. Imagine a student, even if he had the most brilliant mind in the world, being able to impress his peers, his teachers, and the community of psychologists by something he said in a seminar! Not even the best known psychologist could achieve such a result. Perhaps in very limited, very specialized subfields it is possible to earn instant recognition for a creative idea, but the lack of common conceptual commitment, the fragmentation of the domain, guarantees that the recognition will remain for a long time parochial.

There is another sense in which time is implicated in the systems model developed in Fig. 4.1. The arrows pointing from person to field to domain. Actually describe an ascending spiral, because every new bit of information added to the domain will become the input for the next generation of persons. Thus, the model represents a cycle in the process of cultural evolution. As the terms suggest, *variation*, *selection*, and *transmission* are the three main phases of the cycle, and these are also the main phases of every evolutionary sequence (Campbell 1965, 1976). We might conclude that creativity is one of the aspects of evolution. But contrary to biological evolution, in which information relevant to phenotypic behavior is changed chemically in the genes, cultural evolution involves changes in information coded extrasomatically. Dawkins (1976) coined the term “meme” to refer to a “unit of imitation” that was transmitted from one generation to the next. A meme could be a tool like a stone ax, a formula for smelting copper, the Pythagorean theorem, the first bar of Beethoven's Fifth Symphony, the concept of democracy, the smile of the Mona Lisa—in short, any structured information that could be remembered that was worth passing on through time. Using Dawkins's term, we would say that a domain is a system of related memes that change through time, and what changes them is the process of creativity (Csikszentmihaiyi and Massimini 1985).

The Generative Force of the Field

In Fig. 4.1, the arrows go in a clockwise direction from domain to person to field, and then again to the domain—at a later point in time. This sequence, although it accurately represents the main trends, does not exhaust all the possibilities. A field—or the society that harbors it—may stimulate directly the emergence of new ideas in people who otherwise would never have taken up work in a particular domain.

The case of Brunelleschi is a good example. He was clearly one of the most creative individuals of the Renaissance, whose impact on the future of architecture

is indisputable. Yet by all accounts he never would have become an artist and architect if he had been born a generation earlier, when the community of Florence was less interested in sponsoring art. Brunelleschi was the son of an upper-class professional, a notary with good political connections, and he went through the best educational training the city had to offer. Everyone expected him to follow a career in the liberal professions. Yet at the age of 23, in 1398, Brunelleschi joined the goldsmiths' guild and started practicing the plastic arts. It was a startling choice for a scion of the oligarchy (Heydenreich 1974, p. 31), but as the demand for good artists became more intense, more of his peers followed Brunelleschi's example.

Florence in the first 25 years of the fifteenth century illustrates well how the field can stimulate the emergence of creativity. There is general agreement that during those few years some of the most enduringly original works of art were produced in what was a relatively small community. An approach to creativity that focused on the person would have to explain what happened in Florence by postulating a sudden and temporary increase in the originality of individual artists, presumably based on genetic drift or some environmental change that increased originality. But the more likely explanation is that individual potentialities remained constant, and the changes that produced the Renaissance took place in the social system, the field of art, and, to a lesser extent, the culture and the domain.

By the dawn of the fifteenth century, Florence had been the foremost financial center of Europe for almost two centuries, and one of its main manufacturing centers. By judiciously lending money to various kings and princes in England, Germany, and France, at least a dozen families in Florence (the Mozzi, Peruzzi, Bardi, Spini, Scali, Pulci, Abbati, Falconeri, Alfani, Alberti, Chiarenti, Cerchi, Buonsignori, Franceni, Rimberty, not to mention the latecomers Strozzi and Medici) had become the leading capitalists in the Western world. There were several dozen wealthy merchant families, and hundreds profited from the making of wool and silken textiles and from working metals. In the words of one historian, "the other great requirement of art, patronage, sprang from the same financial source" (Cheyney 1936, p. 273).

The social situation was not one that would appeal to our democratic sensibilities. According to one sociologist, the Florentine worker was "completely deprived of all civil rights... capital [ruled] more ruthlessly and less troubled by moral scruples than ever before or after in the history of Western Europe" (Hauser 1951, p. 20). Nor were foreign affairs in better shape; during those years, Florence was engaged in constant life-and-death struggles against Milan and Naples (Hartt 1979). Yet rising production led to increased home consumption, and by a fortuitous chain of events, such as the discovery of long-buried Roman buildings and sculpture, and the influence of new ideas from the Middle East, the consumption of the wealthy Florentines was channeled into the patronage of works of art.

It might help to understand the genesis of creativity if we review briefly the events of those crucial 25 years of Florence. Most art historians agree on what were the greatest accomplishments of that period. Any list would include, at the very least, the following: the making of the north doors of the Baptistery by

Ghiberti (1402–1424); the statues of St. Mark (1411) and St. George (1415) that Donatello placed in the chapel of Orsanmichele; the statue of St. Philip (1414) by Nanni di Banco in the same location; Brunelleschi's start on the Foundling hospital (1419), the cathedral cupola (1420), and the Sacristy of San Lorenzo (1421); the frescoes of the Adoration of the Magi by Gentile da Fabriano (1420–1423); and those Masaccio painted in the Brancacci Chapel (1424–1427). These three works of architecture, three sculptures, and two sets of paintings are generally held to be the most notable achievements of the early Renaissance in Florence (Hartt 1979; Heydenreich 1974).

Now, in each of these eight cases, the impetus for doing the work came either from a rich individual who wanted to celebrate the name of his family (the works of Masaccio and Gentile da Fabriano and Brunelleschi's sacristy were commissioned, respectively, by the bankers Brancacci, Strozzi, and Medici for their churches) or from one of the political or guild unions (Ghiberti's doors were commissioned by the merchants' guild; the Signoria asked for and paid for the statues of Donatello and Nanni; the silk weavers' guild got the Foundling Hospital built; and the wool guild supervised the building of the dome).

The building of this famous dome gives a glimpse of how the community directed artistic production. The executive power was in the hands of a 12-man committee, the Operai del Duomo, who were selected from various corporations, with a preponderance of wool merchants and manufactures. The function of this committee was to organize competitions, select the best entries, commission the winning artists, supervise the work in progress; and pay for the finished product. In the case of the cupola, general plans had been drawn up as far back as 1367, but despite several competitions, no architect had been able to satisfy the stringent requirements of the Operai. It is well known that during this period a large proportion of the populace took part in the selection process: suggestions, letters, and criticism flowed steadily from citizens to the Operai, expressing their ideas of how the dome of the cathedral should be built. Finally, more than 70 years after the first plans, Brunelleschi and Ghiberti were entrusted with the great task.

The "Gates of Paradise" that Ghiberti finally built for the Baptistry went through a similar close scrutiny. The Calimala, or merchants' guild, appointed a jury of 34 experts to review the entries. Before the contest, the jury consulted some of the leading scholars of Italy about what the subject matter of each of the 28 panels of the doors should be. Of the several dozen artists who prepared sketches for the commission, six were chosen for the final list. They were given 1 year to prepare a bronze relief that would serve as the test entry, and during this period their production costs and living expenses were covered by the Calimala (Hauser 1951, p. 39). The test consisted in making a panel illustrating the sacrifice of Isaac. After the year had passed, Ghiberti, who in 1402 was only 23 years old and almost unknown, was judged to have done best. For the next 50 years he worked first on the north, then on the east doors, with the continuing financial and critical backing of the guild (Heydenreich 1974, p. 129).

It was this tremendous involvement of the entire community in the creative process that made the Renaissance possible. And it was not a random event, but a

calculated, conscious policy on the part of those who had wealth and power. The goal of the Florentines was to make their city into a new Athens (Hauser, 1951, p. 23). In terms of our model, an unusually large proportion of the social system became part of the art “field”, ready to recognize, and indeed to stimulate, new ideas,

“In this environment”, wrote Heydenreich (1974, p. 13), “the patron begins to assume a very important role: in practice, artistic productions arise in large measure from his collaboration”. Hauser’s position is even more extreme: “[In] the art of the early Renaissance ... the starting point of production is to be found mostly not in the creative urge, the subjective self-expression and spontaneous inspiration of the artist, but in the task set by the customer” (Hauser 1951, p. 41).

Implications of the Model

At this point, some readers used to the person-centered perspective on creativity might begin to feel that the argument I am developing is a betrayal of psychology in favor of historical or sociological approaches. This is surely not my intention. It seems to me that an understanding of the complex context in which people operate must eventually enrich our understanding of who the individual is and what the individual does. But to do so we need to abandon the Ptolemaic view of creativity, in which the person is at the center of everything, for a more Copernican model in which the person is part of a system of mutual influences and information.

The Domain Level

A long agenda of questions can be generated from this approach, questions that usually are ignored in creativity research yet might hold the key to many important findings.

In terms of the domain, the basic question is “What are the various ways in which information can be stored and transmitted, and how does the structuring of information affect creativity?” We need to develop concepts and measures to evaluate the structuring of information, so as to discover which symbol systems are better able to store creative ideas, and to transmit them over time. The work of Feldman (1980) was a pioneering attempt in this direction, and so is the direction of research pursued by Project Zero at Harvard (Perkins 1981). The newly emerging fields of cognitive science and artificial intelligence (Gardner 1985) also will have much to contribute to answering such questions.

We also need to understand better how access to information is differentially open to various categories of individuals. Basically, this amounts to the question “flow can we make past creativity available to the most people, so as to facilitate future creativity?”

The other side of the coin is the question “How can we motivate people to become involved in a particular domain?” The issue here is not how to provide extrinsic motivation like money and recognition, which more properly belong to the concerns of the field, but rather how to ensure intrinsic motivation, which hinges on the inherent attractiveness with which the information is presented. For no matter how original one might be, if one is bored by the domain, it will be difficult for one to become interested enough in it to make a creative contribution. The ability to attract and sustain interest rests in part on how well the domain is internally organized. How motivation and personality more generally are implicated in creativity has been extensively studied (Amabile 1983; Csikszentmihalyi 1986; Csikszentmihalyi and Getzels 1973; Roe 1946), but we still know very little, about the specific motivational values of different ways of patterning information.

The Person

Because most studies of creativity focus on individual processes, this is the phase of the creative cycle that needs the least attention, being the best known. The main conceptual question here is “How do some individuals get to produce a greater amount of variation in the domain than others?” The answer to this question is going to involve motivational and affective variables as well as cognitive ones. It is likely that some children are born with more sensitivity to certain ranges of stimulation—to light as opposed to movement, or to sound—and therefore might be more advantaged in dealing with the nemes to which they are more sensitive (Gardner 1983). The ways in which various information-processing strategies are used by creative children are being actively investigated (Bamberger 1986; Siegler and Shrager 1984; Sternberg 1984). It is also likely that early experiences (Walters and Gardner 1986) and demographic variables such as sibling position, social class, or religious upbringing will have their effects. The importance of “problem finding” as an approach to creative tasks has been documented longitudinally with artists (Csikszentmihalyi and Getzels 1971, 1988).

Careful studies of truly creative individuals that take into account all the facets of the complex interactions among person, field, and domain are especially needed and in scarce supply. Some examples of attempts in this direction are Gruber’s study (1981) of Darwin, Getzels and Csikszentmihalyi’s longitudinal study (1976) of young artists, and Feldman’s continuing investigations (1986) of prodigiously gifted children.

The Field

It is probably true that less is known about the effects of the social system on creativity than about the other two phases of the cycle. The theoretical issue here is

“What forms of organization facilitate the selection of new variants and their inclusion in the domain?” Bloom (1985) has documented the extensive support system, including devoted parents and committed teachers, that gifted children need in order to master the skills required by a domain. Getzels and Csikszentmihalyi (1968) and Csikszentmihalyi et al. (1984) have shown how social roles interact with artists’ personalities to determine success in the field. Simonton (1978, 1984) has conducted extensive studies of the relationship between features of the social system and the frequency of creative behavior.

A start in the right direction has certainly been made. Psychologists studying creativity have begun to realize the relevance of related approaches. The history of science, the history of ideas, cognitive science, artificial intelligence, and organizational sociology are no longer out of bounds for those who wish to get a strong grip on the issues. But all these promising studies—and the many others there was no room to mention—are thus far unrelated to each other, as if these distinct aspects of the creative process could be understood in isolation from each other. Perhaps even more than new research, what we need now is an effort to synthesize the various approaches of the past into an integrated theory. Of course, all this poaching in neighboring territory places an added burden of scholarship on the psychologist. The systems approach demands that we become versed in the skills of more than one discipline. The returns in knowledge, however, are well worth the effort.

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