Intrinsic Motivation in Museums: Why Does One Want to Learn?

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One often meets successful adults, professionals, or scientists who recall that their lifelong vocational interest was first sparked by a visit to a museum. In these accounts the encounter with a real, concrete object from a different world — an exotic animal, a strange dress, a beautiful artifact — is the kernel from which an entire career of learning grew. For others with an already developed curiosity about some field such as zoology, anthropology, or art, the museum provided an essential link in the cultivation of knowledge — a place where information lost its abstractness and became concrete. In either case, many people ascribe powerful motivation to a museum visit, claiming that their desire to learn more about some aspect of the world was directly caused by it.

Granted that these accounts of "crystallizing experiences" (Walters and Gardner 1986) attributed to museums might often be embellished and exaggerated in retrospect, it would be rash to dismiss them entirely, for the fascination of museums seems to be a very real psychological phenomenon. The question rather becomes, How do museums motivate viewers to learn? Is there a unique, *sui generis* "museum experience" that helps viewers start on the long journey of learning? How do museums present information in a meaningful way, a way that deepens a person's experience and promotes further learning? To begin answering these questions, it will be useful to review what we know about human motivation in relation to learning.

Children are born with a desire for knowledge, and some of the most stupendous feats of learning — to walk, talk, get along with others, to take care of oneself — are accomplished without seeming effort in the first few years of life. It would be difficult to see how a species as dependent on learning as we are could have survived if we did not find the process of making sense of our environment pleasurably rewarding. But this spontaneous propensity is often extinguished as children's desire to learn is rechanneled in new directions by societal goals and expectations. The abstract, externally imposed tasks children confront in school undermine the motivation to learn for many, often for the rest of life. Research indicates that the natural motivation to learn can be rekindled by supportive environments (Deci et al. 1981; Deci 1992; McCombs 1991); by meaningful activities (Maehr 1984; McCombs 1991); by being freed of anxiety, fear, and other negative mental states (Diener and Dweck 1980; McCombs 1991); and when the challenges of the task meet the person's skills (Csikszentmihalyi 1990a, 1990b).

The view of learning taken in this paper is broader than mere knowledge acquisition, although that is certainly an important part of it. In our view, learning involves an open process of interaction with the environment. This experiential process develops and expands the self, allowing one to discover aspects of oneself that were previously unknown. Thus the learning experience involves the whole person, not only the intellectual but the sensory and emotional faculties as well. And when complex information is presented in a way that is enjoyable — intrinsically rewarding — the person will be motivated to pursue further learning.

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Extrinsic and Intrinsic Motivation

Human action is motivated by a combination of two kinds of rewards: extrinsic and intrinsic. Action is *extrinsically* motivated when the anticipated rewards come from outside the activity. In this case, performance is simply a means to some other end — to obtain praise or to avoid punishment, to get a degree, or to live up to societal expectations. A person acts for the sake of intrinsic rewards when the performance itself is worth doing for its own sake, even in the absence of external rewards. For example, most

sports, games, and artistic activities are intrinsically motivated, because except for a few professionals, one gets no rewards from performing them beyond the experience itself. Usually we are motivated by both extrinsic and intrinsic rewards at the same time. I might go to work every day primarily because, if I don't, I will get fired, and I need the job to pay my bills. But if in addition I also enjoy my job, the quality of my life will improve, and I am likely to get better at what I am doing.

This general principle holds for learning as well. Most learning in schools is extrinsically motivated (Csikszentmihalyi and Larson 1984). The acquisition of knowledge is rarely enjoyed for its own sake, and relatively few young people would continue to learn in schools in the absence of parental and societal pressures. Because of the stress on external incentives in formal education, intrinsic motivation in schools has been rarely studied. Classic examples are studies that seek to find ways to make the task of learning subject matter and participating in classroom activities more intrinsically motivating (see, e.g., Benware & Deci 1984; Lepper and Cordova 1992).

Learning is intrinsically motivated when it is spontaneous. The most clear examples of intrinsic motivation may be found watching children at play. When playing, children pay attention because they want to, because they find the information interesting and important in its own right. People are intrinsically motivated when they are freely expressing themselves by doing what interests them (deCharms 1968; Deci and Ryan 1985; White 1959). Dweck (1986) and others (Nicholls, Patashnick, and Nolen 1985; Heyman and Dweck 1992) describe students who are intrinsically motivated as having "learning goals," while students who are extrinsically motivated have "performance goals."

Students who are intrinsically motivated tend to have higher achievement scores (Hidi 1990; Lepper and Cordova 1992; Gottfried 1985), and they develop their aptitudes further over time (Csikszentmihalyi, Rathunde, and Whalen 1993). Intrinsic enjoyment of learning appears to be associated with higher creativity as well (Amabile 1983, 1985). Under certain conditions, external rewards appear to undermine intrinsic motivation and to decrease performance (see, e.g., Deci 1971, 1972; Lepper and Greene 1978; McGraw 1978). When one's mind becomes focused on meeting an external goal or requirement, attention or "psychic energy" is split and no longer fully focused on the task at hand.

Schools can afford to ignore intrinsic rewards to a certain extent, because they have strong external incentives—grades, truant officers—to enforce learning. Of course, such extrinsically motivated learning is very wasteful and inefficient. But museums, without external means to compell a visitor's attention, must rely almost exclusively on intrinsic rewards. How, then, can intrinsic rewards be made a part of the museum experience?

The Origins of Intrinsic Motivation

Psychologists began to write about intrinsic motivation in the late 1950s, when some researchers concluded that the basic physiological needs for food and security did not seem to explain why rats explored new territory, were willing to work just to see novel sights, and experimented with challenging tasks (Csikszentmihalyi and Nakamura 1989). These findings suggested that the basic list of "drives" had to be expanded by adding novelty, curiosity, and competence drives (Butler 1957; Harlow 1953; Montgomery 1954; White 1959). More recently, Deci (1992) stated that the inherent psychological needs are competence, self-determination, and relatedness (see also White 1959). In any case, the desire to learn for its own sake appears to be a natural motive built into the central nervous system. A species could not survive long if it did not find pleasure in processing information (Butler 1957; Hebb 1955; Miller 1983, p.111; Montgomery 1954; Tiger 1992; Csikszentmihalyi 1993). As Miller wrote, "The mind survives by ingesting information."

Clearly, however, not all information is equally attractive. Because a person cannot process more than a limited amount of information at a time (Kahneman 1973; Hasher and Zacks 1979; Csikszentmihalyi 1978, 1993), environmental stimuli compete for attention with each other. Attention is a scarce resource — perhaps the most precious scarce resource there is (Simon 1969, 1978). Even though we are surrounded by exponentially increasing waves of information, the amount of it that any person actually notices and then retains in memory may be less than it was in the days of our cave-dwelling ancestors, and it certainly cannot be much more. Therefore what information we select to attend to, and how intently, is still the most important question about learning.

Curiosity and Interest

In the first instance, we choose what information to attend to in terms of curiosity and interest. Curiosity refers to individual differences in the likelihood of investing psychic energy in novel stimuli. For instance, if we say that Mary is curious we mean that compared to other persons she will devote more effort to find out things she does not know (or is not supposed to know). Of course we are all curious to a certain degree, in that our attention is attracted by novel or unexplained stimuli — a loud noise, a sudden bustling activity, a strange animal, or a mysterious object. It is by appealing to this universal propensity that museums can attract the psychic energy of a visi-

tor long enough so that a more extensive interaction, perhaps leading to learning, can later take place.

Interest refers to a differential likelihood of investing psychic energy in one set of stimuli rather than another. To say that Mary is interested in horses means that she is likely to talk about horses, to seek out information about them, to think about them, and to wish that she could feed, groom, and ride horses more than she does these things in relation to, say, dogs, cats, elephants, or gerbils. If we had no interests, the sensory world would be completely confusing, because we would literally not know where to turn. As William James ([1890] 1950, p. 402) remarked over a hundred years ago:

> The moment one thinks of the matter, one sees how false a notion of experience that is which would make it tantamount to the mere presence to the senses of an outward order. Millions of items in the outward order are present to my senses which never properly enter into my experience. Why? Because they have no *interest* for me. *My experience is what I agree to attend to. Only those items which I notice* shape my mind—without selective interest, experience is an utter chaos. (James 1890, 402).

Interests are partly universal, partly the result of individual experiences and one's idiosyncratic personal history. Most people are interested in food when hungry, in the opposite sex, in whatever gives them power or acclaim, in babies and pets. But beyond these few common targets, interest soon becomes unpredictable. Some people are attracted to car engines, others to ancient Mesopotamian toothpicks, some to maps, and others to baseball cards.

Most researchers regard interest as a phenomenon that emerges from an individual's interaction with the environment, and they distinguish between situational interest and individual interest (Krapp, Hidi, and Renninger 1992). Situational interest occurs when one encounters tasks or environments with a degree of uncertainty, challenge, or novelty. These environments nourish our built-in propensities for curiosity and exploration. According to Berlyne (1960, 1974), certain structural stimulus characteristics, such as novelty, surprisingness, complexity, and ambiguity, lead to motivational states that result in curiosity and exploratory behavior.

Contextual characteristics that evoke situational interest—or curiosity—tend to be similar between individuals. These contextual stimuli provide the "hook" for museums to capture visitor attention. Without such situational interest, viewers may not attend to an exhibit at all. Hence unobtrusive observation of how visitors allocate attention is one of the most videly used techniques for assessing the effectiveness of museums (Loomis 1987; Serrell and Ralphling 1993).

But because situational interest "tends to be evoked suddenly by something in the environment, it often has only a short-term effect and marginal influence on the subject's knowledge and reference system" (Krapp, Hidi and Renninger 1992, p. 6). Thus situational interest may not affect one's motivation to learn more. In contrast, individual interest is defined as a relatively enduring preference for certain topics, subject areas, or activities (Hidi 1990). The pursuit of individual interests are usually associated with increased knowledge, positive emotions, and the intrinsic desire to learn more (Krapp, Hidi & Renninger 1992).

In *Interest and Effort in Education* (1913) John Dewey described the importance of individual interest. Students who are not genuinely interested in learning a particular subject do not identify with the material and only put out temporary, marginal effort. Dewey described this type of learning as forced and coercive. He believed it resulted in mechanical knowledge and did not effect a qualitative change in the individual (see also Schiefele 1991, p. 300). On the other hand, individual interests are intrinsically motivating, propelling an individual to pursue further learning opportunities. While interests tend to be individually unique, they are broadly characterized as having high personal meaning (Dewey 1913; Maehr 1984; Schiefele 1991). But an activity need not be already meaningful to a person in order for it to provide intrinsic rewards. For instance, John may reluctantly agree to join his friends in a game of bridge, expecting it to be a waste of time. Yet after a few hands the stimulation provided by the game turns out to be so enjoyable that John can hardly leave the table.

Museum visitors may at first attend to an exhibit because of curiosity and interest. But unless the interaction with the exhibit becomes intrinsically rewarding, visitors' attention will not focus on it long enough for positive intellectual or emotional changes to occur. Therefore it is important to consider what makes an experience rewarding in and of itself, so as to understand what may motivate a person to look and think about an exhibit for "no good reason"—that is, in the absence of external rewards.

The Flow Experience

Studies conducted in a great variety of settings by different investigators have shown that a common experiential state characterizes situations in which people are willing to invest psychic energy in tasks for which extrinsic rewards are absent. Chess players, rock climbers, dancers, painters, and musicians describe the attraction of the activities they do in very similar terms, stressing the fact that what keeps them involved in these demanding activities is the quality of the experience that ensues. Many activities that are

also well rewarded with money and prestige, such as surgery or computer programming, also seem to offer intrinsic rewards in addition to the extrinsic ones; and these are similar to the ones that artists and athletes mention. We have called this common experiential state the flow experience, because it is generally described as a state of mind that is spontaneous, almost automatic, like the flow of a strong current (Csikszentmihalyi 1975, 1990a). If a museum visit can produce this experience, it is likely that the initial curiosity and interest will grow into a more extensive learning interaction.

A general characteristic of activities that produce flow is that they have clear goals and appropriate rules. In a game of tennis, or of chess, one knows every second what one would like to accomplish. Playing a musical instrument, one knows what sounds one wishes to produce. A surgeon has clear intentions during an operation, and it is this clarity of purpose that allows people to become so thoroughly involved with what they are doing. Conflicting goals or unclear expectations divert our attention from the task at hand. In addition to clear goals, flow activities usually provide immediate and unambiguous feedback. One always knows whether one is doing well or not. Musicians find out immediately if they hit a wrong note, tennis players if they hit the ball badly, and a surgeon knows right away if he has made a mistake. This constant accountability for one's actions is another reason one gets so completely immersed in a flow activity.

Another universally mentioned characteristic of flow experiences is that they tend to occur when the opportunities for action in a situation are in balance with the person's abilities. In other words, the challenges of the activity must match the skills of the individual. If challenges are greater than skills, anxiety results; if skills are greater than challenges, the result is boredom. This equation holds for the broadest possible range of skills: for instance, it includes physical, mental, artistic, and musical talents. I will be frustrated reading a book that was "above my head" and bored when reading a book that is too easy and predictable. As skills increase, the challenges of the activity must also increase to continue the state of flow. The skills involved are those perceived by the individual, however, and not necessarily the actual ones. If one thinks of himself as an incompetent football player, this perceived incompetence will affect performance regardless of its validity. Even if one is involved in an activity that typically induces flow, flow cannot be attained if he or she is worried about performance or if other negative mental states prevail.

Research has substantiated the importance of a positive state of mind for learning. McCombs (1991, p. 119–20) writes that "in the absence of insecurity (e.g., feeling afraid, being self-conscious, feeling incompetent), individuals are natural learners and enjoy learning. . . . Insecurities and other forms of negative cognitive conditioning interfere with or block the emergence of individuals' natural motivation to continually learn, grow, and develop in positive and self-determining ways." Negative mental states such as self-consciousness, depression, anxiety, loneliness, or anger also disrupt the flow experience (Csikszentmihalyi 1985). Dweck and her colleagues' (Dweck 1975; Diener and Dweck 1980) research on "learned helplessness" highlights the serious effects of low self-esteem and anxiety on learning achievement. The intrinsically motivated learning state is characterized by unselfconsciousness, joy, serenity, involvement, and happiness (Csikszentmihalyi 1985).

When goals are clear, feedback is unambiguous, challenges and skills are well matched, then all of one's mind and body become completely involved in the activity. Attention is focused and concentration is so intense that there is no attention left over to think about anything irrelevant or to worry about problems. In the flow state, a person is unaware of fatigue and the passing of time; hours pass by in what seems like minutes. This depth of involvement is enjoyable and intrinsically rewarding. In many cases, individuals describe the experience as becoming "one" with the environment — the painting, the music, the team. People often mention a sense of self-transcendence, as when chess players feel their moves becoming part of a universal field of forces or when dancers feel the rhythm that moves them as part of the "harmony of the spheres."

Flow activities lead to personal growth because, in order to sustain the flow state, skills must increase along with the increased challenges. Flow involves the person's entire being and full capacity. Since flow is inherently enjoyable, one is constantly seeking to return to that state, and this need inevitably involves seeking greater challenges. In the process, flow activities provide a sense of discovery; we discover things about ourselves as well as about the environment. Flow activities, whether they involve competition, chance, or any other dimension of experience, provide a sense of discovery, a creative feeling of being transported into a new reality. They push us to higher levels of performance and lead to previously unexperienced states of consciousness. In short, they transform the self by making it more complex. In this growth of the self lies the key to flow activities. One cannot enjoy doing the same thing at the same level for long. We grow either bored or frustrated; and then the desire to enjoy ourselves again pushes us to stretch our skills or to discover new opportunities for using them.

If these conditions are present, it is possible for individuals to be in flow in any activity, be it conversation, solving differential equations, or driving a car.

A participant in one of our studies was in flow while watching the Chicago Bulls play basketball on television. He knew in detail each of the players' strengths, weaknesses, and definitive plays. "I can totally shut away everything else. . . . I played basketball when I was in high school. I think it's the most talent-demanding of professional sports. . . . You get to know what people do, and you get sucked into their techniques because you can practically predict [their next move]." However, when the New York Knicks game came on, he became distracted and bored, as he was not as familiar with the play patterns of this team. A person who becomes interested in hockey will feel that it is the "most talent-demanding of professional sports," and the same holds for soccer or baseball; in other words, what we invest a great deal of attention in is bound to become ever more interesting and salient.

It is often assumed that for learning cognitive processes are more important than affective processes. But as Schiefele (1991) points out, it is likely that affective processes are at least as important for evoking broader conceptual understanding rather than simple fact retention. Because emotional factors may influence learning only indirectly by stimulating cognitive processes, their importance is easily underestimated (Schiefele 1991, p. 316; Isen, Daubman, and Gorgoglione 1987; Pekrun 1990).

From Flow to Enduring Meaning

When a person is in flow, or fully enjoying an intrinsically motivated activity, he or she usually describes two dialectically related characteristics. On the one hand, when involved in the activity, the individual fully expresses the self. In the process, he or she discovers previously unknown and unrealized potentials and skills. Following Aristotle's views on the purpose of life, Dante wrote: "In every action . . . the main intention of the agent is to express his own image. . . . In action the doer unfolds his being" (quoted in Csikszentmihalyi and Rochberg-Halton 1981, p. 48). The statement: "It is like designing, discovering something new," is the one most strongly endorsed by people as being similar to the phenomenology of the flow experience (Csikszentmihalyi 1975). One recent study participant told us that she finds "learning often comes as a surprise." This process of discovery and learning about who we are could be thought of as *differentiation* — the process of developing a unique self.

On the other hand, people in flow tend to feel connected with other entities, such as nature, a team, the family, or the broader community. Or in the case of many solitary pursuits, the activity connects one with a system of thoughts or beliefs. A rock climber may declare that climbing is for him a form of "self-communication" (Csikszentmihalyi and Csikszentmihalyi 1988). Cameron (1992, p. 53) says that "attention is an act of connection." When we fully attend to something, we connect with life and thus fulfill the basic human need for relatedness. "The flow experience . . . is symbolic because it brings together the psychic processes of the person and unites them with a set of objective stimuli in the environment. This is opposite from the state of alienation, in which one feels separated from oneself and from the elements of one's life" (Csikszentmihalyi and Rochberg-Halton 1981, p. 247). This process of connection could be referred to as *integration*. Moore (1992, p. 261) says that "when we allow the great possibilities of life to enter into us, and when we embrace them, then we are most individual." When this integration occurs, an activity becomes meaningful, and we become both more connected and more differentiated.

Meaningful experiences are those that are both differentiated and integrated. This dialectical process of integration and differentiation is necessary for psychological development and personal growth (Damon 1983; Fowler 1981; Kohlberg 1984; Loevinger 1976; Maslow 1968). For example, the psychiatrist H. F. Searles (1960, p.30) states this dialectic as follows:

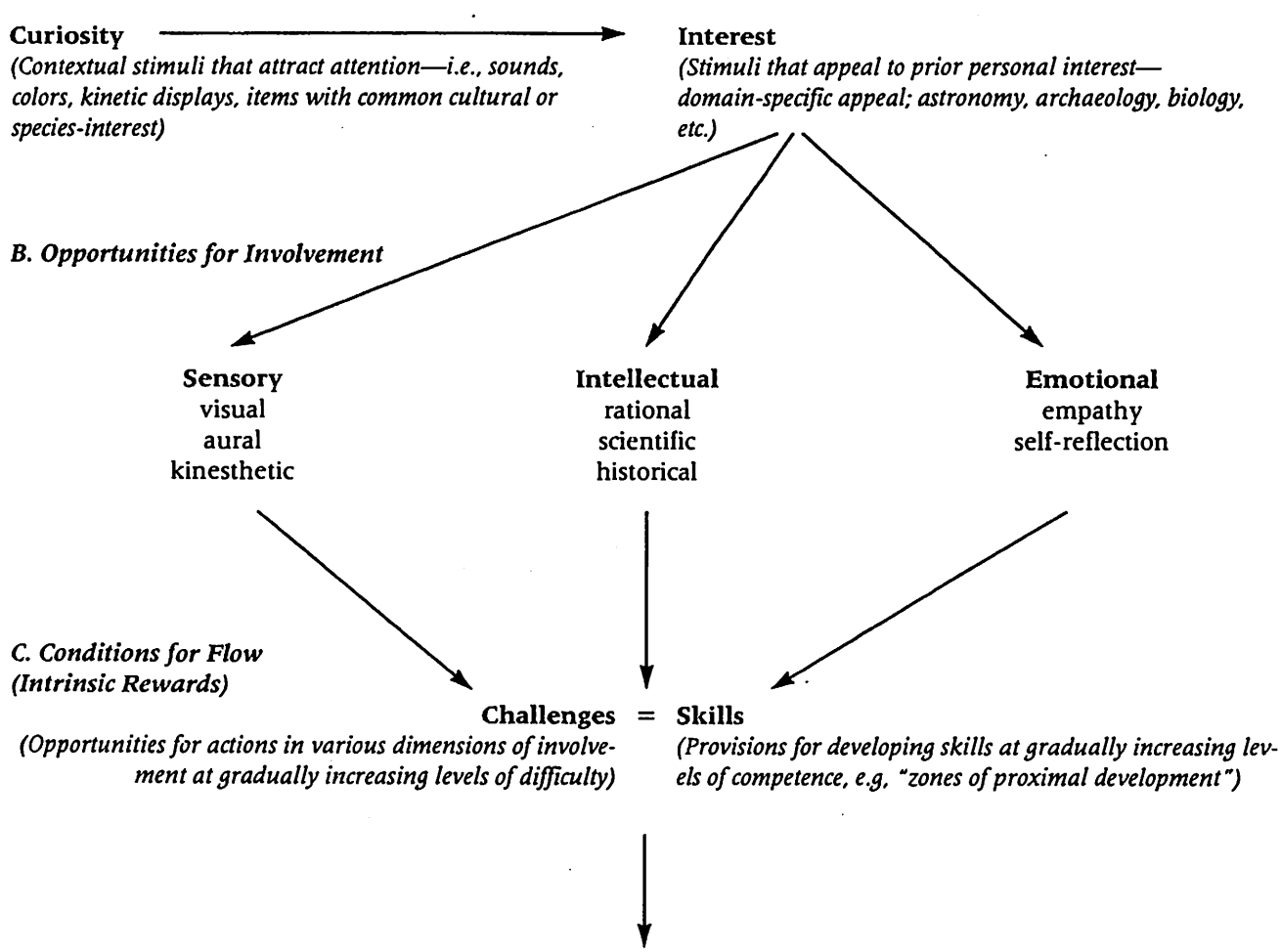
> The human being is engaged, throughout his life span, in an unceasing struggle to differentiate himself increasingly fully, not only from his human, but also from his nonhuman environment, while developing, in proportion as he succeeds in these differentiations, an increasingly meaningful relatedness with the latter environment as well as with his fellow human beings.

This dialectic between integration and differentiation is the process by which we learn and grow. On the one hand, we must discover the limits of our being by expressing the purposes and potentials inherent in our biological organism. Only through self-control, through shaping events to our intentions, can we learn who we are and what we are capable of. On the other hand, we must find ways to expand our limited selves by forging ties with other human and nonhuman systems. Motivational research has highlighted the importance of both individual autonomy and connection for facilitating intrinsic learning.

Implications of Intrinsic Motivation for Museums

How do these general principles apply to the kind of learning that can take place in museums? A schematic representation of the process of intrinsic motivation at work in museums is presented in figure 1. Following the steps of this process, it will be easier to see the concrete implications of motivational theory. Of course, such a schematic approach cannot deal with all the practical problems museums face. One of the major obstacles to an easy movement from theory to

Figure 1. The development of learning through intrinsic motivation in museum settings



practice is the fact that visitors come with such a broad range of interests and backgrounds that no single recipe for motivating them could possibly apply across the board. Nevertheless, these broad outlines can be quite helpful if one takes the trouble of adapting them to particular specific conditions.

The "Hook"

The first step in the process of intrinsically motivated learning suggests that the museum exhibit must capture the visitors' curiosity. Michael Spock, as experienced a professional as they come, says that dinosaurs and mummies are the surest exibits to attract attention. Probably the reason for this attraction is overdetermined: both dinosaurs and mummies are ancient and therefore mysterious; both invoke awe and a thrill of fear without actual danger. These seem to be universal reasons for people to want to pay attention. Others are pleasing displays with bright colors, interactive exhibits, large size, and other stimuli that provide the situational interest necessary to attract attention.

Museum researchers have already demonstrated that visitors remember better displays to which they have paid more attention (Falk 1991; Koran, Foster, and Koran 1989). However, we still are far from knowing what the fundamental dimensions of situational interest are. Until we collect systematic knowl-

edge on this topic, we shall have to proceed by trial and error, finding out which components of an exhibit are most attractive, for whom, under what conditions. In other words, museum work will continue to be an art rather than a science. Although this is not necessarily bad, a larger contribution of scientific knowledge would surely help.

After the individual's curiosity is aroused, the exhibit must engage sustained interest in order for learning to take place. While individuals vary in what they are interested in — astronomy, sports, mechanics, archeology, biology and so on — some general guidelines could be proposed. Most important, the link between the museum and the visitor's life needs to be made clear. To inspire intrinsic motivation, the objects one finds and the experiences one enjoys, while possibly inspiring awe and a sense of discovery, should not feel disconnected from one's own life. Moore (1992, p. 285) asserts that "when art is removed as the province of professional artists, a dangerous gulf develops between the fine arts and the everyday arts. The fine arts are elevated and set apart from life, becoming too precious and therefore irrelevant. Having banished art to the museum, we fail to give it a place in ordinary life." What Moore says about art could be said of museums in general. It is to be hoped that the museum experience will inspire visitors to see the relationship between the exhibits and their own concerns and perhaps be stimulated to create art, pursue science, and so on, after leaving the museum.

For example, an exhibit on rock formations may be informative and pleasantly arranged. In addition, the exhibit may have features that are challenging and allow one to explore and develop skills. But the features of the exhibit that will induce the motivation to learn more are the deeper sense of meaning it provides. How does this exhibit pertain to me? How does knowing about these rock formations link me to other people and times, the larger cosmos? Education should "speak to the soul as well as the mind" (Moore 1992, p. 36). How does knowledge of rock formations provide a "soulful" connection? Unless we make progress in answering such questions, the information provided in the display is likely to disappear from the visitor's consciousness without leaving any trace in memory.

Opportunites for Involvement

Learning involves the use of sensory and emotional faculties, as well as intellectual ones, and this connection leads us to the third step in the process. To engage intellectual faculties, the exhibit should encourage what Langer (1993; see also 1989) has termed "mindfulness." Mindfulness is the "state of mind that results from drawing novel distinctions, examining information from new perspectives, and being sensitive to context. It is an open, creative probabilistic state of mind in which the individual might be led to finding differences among things thought similar and similarities among things thought different" (Langer 1993, p. 44). Exhibits that facilitate mindfulness display information in context and present various viewpoints. For example, Langer (1993, p.47) contrasts the statement "The three main reasons for the Civil War were . . ." with the statement "From the perspective of the white male living in the twentieth century, the main reasons for the Civil War were . . . " (p. 47). The latter approach calls for thoughtful comparisons. For example, How did women feel during the Civil War? the old? the old from the North? the black male today? and so on.

Information that is presented as true without alternative perspectives discourages the motivation to explore and learn more. Langer (1993, p. 45) terms this situation a "premature cognitive commitment," denoted by rigid beliefs mindlessly accepted as true (see also Langer and Imber 1979). In sum, intrinsically motivated learning is an open process involving uncertainty and the discovery of new possibilities. A fixed presentation of the material thwarts such further exploration. It is only through the conscious choice of various possibilities that one can learn who one is, what one's interests and beliefs are, and where one's unique talents lie (Csikszentmihalyi and Rochberg-Halton 1981; Csikszentmihalyi and Robinson, 1990).

But when we are intrinsically motivated to learn, emotions and feelings are involved as well as thoughts. For example, our wish to know about peoples in faraway places includes not only the desire for intellectual understanding but the desire to feel emotionally connected to them as well. We are often drawn to exhibits containing diaries and personal letters because they connect us with another's feelings. As Moore (1992, p. 208) states:

> We have spiritual longing for community and relatedness and for a cosmic vision, but we go after them with literal hardware instead of with sensitivity of heart. . . . Our many studies of world cultures are soulless, replacing the common bonding of humanity and its shared wisdom with bites of information that have no way of getting into us deeply, of nourishing and transforming our sense of ourselves. Soul, of course, has been extracted from the beginning because we conceive of education to be about skills and information, not about depth of feeling and imagination.

Museum researchers have become increasingly aware that it is not enough to attract the fleeting attention and interest of visitors; to be effective, museums must provide opportunities for the kind of deep absorption that leads to learning (Harvey,

Birjulin, and Loomis, forthcoming; Thompson 1993). This is what Bitgood (1990, p. 1) calls "simulated immersion," or "the degree to which an exhibit effectively involves, absorbs, engrosses, or creates for visitors the experience of a particular time and place."

Conditions for Flow

When the visitor is interested in an exhibit and engaged through sensory, intellectual, and emotional faculties, he or she should be ready to experience an intrinsically rewarding, optimal experience. But for this experience to occur, the conditions for flow must be present. In the previous section, we have seen that one of the main requirements for flow is to have clear goals. Unfortunately, one of the complaints visitors most often voice is that they do not know what to do when they enter a museum. Helping visitors set manageable goals, both for the entire visit and for each stop at an exhibit, is one way to make the experience more enjoyable. Without feedback, however, involvement is unlikely to be sustained. Successful displays tend to be those that ask visitors to commit themselves to make guesses, to evaluate, to respond — and then provide information by which the visitors can compare their responses to some other standard (Bitgood 1990).

Another feature of successful exhibits is that they offer opportunities for involvement that can be matched with a broad range of visitor skills. This notion was made familiar to the museum community through the "social design movement," one of whose principal aims is to increase the fit between people and their environment (Sommer 1972) or between visitors and informal learning environments (Screven 1976).

In this regard, Vygotsky's (1978) zone of proximal development provides a framework for understanding how to moderate challenges so that they are at the right level. The zone of proximal development is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky 1978, p. 86). When individuals are assisted in particular tasks, they can learn at different levels. With assistance, one third-grade student may learn at a fifth-grade pace, while another learns at a fourth-grade pace. In developing exhibits, it is useful to ask: How much assistance is available for visitors with different levels of knowledge and ability? Do exhibits present gradually increasing levels of difficulty? And are there provisions for developing skills at gradually increasing levels of competence?

In addition to a balance of challenge and skill, the visitor must be able to concentrate and devote full attention to the given exhibit or activity. Well-known physical distractions include crowds, noise, intimidating guards, hunger, bladder pressure, and fatigue. In addition, preconceived notions may provide internal distractions. Concentration can be hindered by rigid expectations — either one's own or someone else's. For example, as Falk and Dierking (1992, p. 54) point out, museum visitors often have the expectation that they "should see the entire museum." Such prior expectations decrease the openness necessary for a meaningful learning experience by causing fixation on an external goal and anxiety over the ability to meet that goal. Another example frequently occurs in art museums when patrons feel they "should" be getting something out of the experience (Csikszentmihalyi and Robinson 1990, p. 144). When visitors feel intimidated or fearful, or when they try to sustain some rigid self-concept or achieve some predefined result, they also lose the openness necessary for an enjoyable learning experience. The physical sources of distraction can be remedied by physical means — reducing crowds, providing better facilities — while the psychological causes must be addressed through information and education.

In addition to negative expectations a person may bring to the museum, negative mental states can be caused by the social context (Deci et al. 1981; McCombs 1991). Thus, the museum environment can either facilitate or hinder flow. Anxiety, embarrassment, or self-consciousness usually vary depending on where we are and whom we are with. Social environments that facilitate intrinsically motivated learning support personal autonomy and responsibility rather than trying to control behavior. These supportive environments provide people with choices (Zuckerman et al. 1978) and acknowledge their perspectives or feelings (Koestner et al. 1984). We express who we are through our conscious choice of actions. Thus it is important to allow individuals to choose whenever possible. People are more open to learning when they feel supported, when they are ina place where they can express themselves and explore their interests without fear of embarrassment or criticism, and when there are no predefined expectations constraining their behavior. Support, security, and trust are critical for allowing openness to discovery and intrinsically motivated learning. For personal growth and development, one must become less dependent on, or constrained by outside guidance, so that spontaneous motivation will have a chance to awaken.

Growth of Complexity in Consciousness

If a museum exhibit induces the flow state, the experience will be intrinsically rewarding. The visitor will be motivated to explore, and as he or she learns more, skills will increase. The consequence of this dynamic involvement is a growth of sensory, intellectual, and

emotional complexity. This growth is especially important to realize now that we live in an information society, when multimedia technology and computers are rapidly changing how we learn and how we are entertained. By pressing a button, in the comfort of our own home, we can learn about the entire history of art, complete with detailed images on the screen; we do not need to enter a museum. But museums offer the opportunity to interact with a real environment, one in which the objects are still imbued with the blood, the tears, the sweat of their makers. Does this contact with the facticity of the historical object actually matter? Or will virtual reality experienced in the communications room of one's home give an even more vivid learning experience than museums now provide?

The jury is still out on these questions. In one respect, however, museums seem to have a distinct advantage over solitary media-induced experiences. They provide information in a public space, where there is a potential to develop the integrative dimension of personal growth. We learn about connectedness through rituals — such as ceremonies or rock concerts — and whenever we are exposed to an event that is shared with others that feeling of connectedness is reaffirmed and strengthened. In modern society, however, there are fewer and fewer venues to experience such shared events. Perhaps one of the major underdeveloped functions of museums is to provide opportunities for individually meaningful experiences that also connect with the experiences of others.

It is essential to realize, however, that current knowledge is insufficient to provide a basis for a thoroughly informed museum practice. While we are getting to understand general principles of motivation tolerably well, the necessary details are still largely lacking. For instance, we have no table where we could look up the elements that will attract the curiosity of different types of visitors; we cannot anticipate the interests of the audience; we have only a rudimentary understanding as to how to balance the challenges of the exhibit with the visitors' skills; we are not sure how to nurture the growth of complexity in the visitors' consciousness after the first sparks are struck. Many of these issues will take decades of basic research to resolve.

In the meantime, however, it seems that each museum could generate knowledge about these pressing questions by taking a more experimental approach, by becoming a more active learning institution. If even 10 percent of museum space and staff efforts were devoted to collecting systematic information about how visitors are affected by the visit, we would soon have a much better idea of what learning takes place within the walls. Only by experimenting with one alternative after the other, in an iterative process, can we learn what works and what does not (Screven 1976). Trying out different displays, different signage, different ways of involving visitors—while making sure that only a single variable is changed at a time—and then measuring the results will yield useful results. It is important to remain flexible in one's policies, so that mistakes can be corrected swiftly and successes can be built on. These are the main features of the experimental method on which all of science is based. But then, as the philosopher Karl Popper said, science is but common sense writ large. There is no reason museums could not use more common sense and develop the habit of writing it large. We would all benefit from it, and museums could go on performing their educational function with a clearer purpose and a renewed sense of self-confidence.

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