

Optimal experience

PSYCHOLOGICAL
STUDIES OF
FLOW IN
CONSCIOUSNESS

Edited by
Mihaly Csikszentmihalyi
& Isabella Selega
Csikszentmihalyi

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For Mark and Christopher

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I. A theoretical model of optimal experience

1. Introduction

MIHALY CSIKSZENTMIHALYI

Some ten years ago the first publications reporting studies of what we have called the "flow experience" appeared in print, beginning with an article in the *Journal of Humanistic Psychology* and then the book *Beyond Boredom and Anxiety* (Csikszentmihalyi 1975a, 1975b). In the relatively short span of time since those unheralded beginnings, scholars in a variety of disciplines have found the concept of an optimal state of experience theoretically useful. A great amount of research has accumulated during the decade, and some of the results are now being applied in educational, clinical, and commercial settings. *Flow* has become a technical term in the field of intrinsic motivation. This introduction briefly reviews the events related to the development of this concept, and the rest of the volume presents some of the most representative and important contributions to the study of the flow experience during these crucial initial years.

The prehistory of the flow concept: before 1975

I was led to investigate the range of experiences that eventually became known as *flow* by certain observations I had made in the course of my doctoral research with a group of male artists (Csikszentmihalyi 1965; Getzels & Csikszentmihalyi 1976). The artists I studied spent hour after hour each day painting or sculpting with great concentration. They obviously enjoyed their work immensely, and thought it was the most important thing in the world. Yet it was quite typical for an artist to lose all interest in the painting he had spent so much time and effort working on as soon as it was finished. As long as he was at work on a canvas, the artist was completely immersed in the painting. It filled his thoughts for twenty-four hours a day. Yet as soon as the paint was dry, he usually

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stacked the canvas in a distant corner of the studio against a wall and promptly forgot it.

Few artists expected any of their paintings to make them rich or famous. Why, then, did they work so hard at the easel – as hard as any executive hoping for a raise or a promotion? None of the extrinsic rewards that usually motivate behavior seemed to be present. Money and recognition appeared to play a minimal part. The object itself – the finished work of art – held few attractions once it was finished. So what accounted for the deep fascination that painting had for the artists?

The deterministic metaphysics underlying modern science suggested that there must be an answer (Popper 1965, p. 61). Regularities in human behavior don't just happen by chance. They are either caused or they have reasons. In psychology, the most widely held causal explanation for why artists paint is some variant of the notion of "sublimation." They enjoy painting, according to this explanation, because it is the closest socially acceptable symbolic expression of the artists' true desires, which are repressed instinctual cravings. But if one observes artists at work for any length of time, the sublimation hypothesis wears thin fairly soon. There is just too much genuine excitement and involvement with the emerging forms and colors to explain it all in terms of a substitution for something else. And why does the artist typically keep seeking ever more complex challenges, why does he constantly perfect his skills if the whole point is to experience vicariously the simple forbidden pleasures of his sexual programming? Up to a certain point sublimation as a cause might be a useful proposition. A few of the artists seemed to have begun painting partly to resolve an Oedipal tangle, or even earlier repressions. But whatever the original cause might have been, it was obvious that the activity of painting produced its own autonomous positive rewards.

Nor were these rewards something that artists expected to achieve after the activity was completed. The usual reason for actions that are not driven by causes is the expectation of reaching a goal-state that acts as a reward for the action. But the reason for painting did not seem to be the usual desire to achieve external goals. That suggested that the reasons might be within the activity: that the rewards of painting came from painting itself.

In the mid-sixties, when these observations were being made, few psychologists were as yet interested in intrinsic motivation; the ruling paradigm was still exclusively focused on explaining behavior in terms of extrinsic rewards. One of the few exceptions was Abraham Maslow.

His distinction between *process* and *product* orientations in creative behavior, which led him to identify "peak experiences," was the conceptual framework closest to the phenomena I was trying to understand (Maslow 1965, 1968). He described people who behaved like the artists in my study: people who worked hard not in order to get conventional rewards, but because the work itself was rewarding. Maslow ascribed the motivation to a desire for "self-actualization," a need to discover one's potentialities and limitations through intense activity and experience.

Maslow's explanation was compelling, but it left many questions unanswered. For example, could any kind of process – or activity – give intrinsic rewards, or only a few chosen ones, like the making of art? Did all intrinsically rewarding experiences *feel* the same; were the intrinsic rewards from art the same as those one gets from sports, or from writing poetry? Did all people have the same propensity to be intrinsically motivated, or did one have to be born an artist to enjoy the making of art? Maslow's pioneering work, primarily idiographic and reflective in nature, did not explore very far the empirical implications of these ideas.

Still intrigued by the question of intrinsic motivation, I turned to the literature on play in the hope of finding an explanation. A substantial body of thought had been developing about the play of children (Piaget 1951; Sutton-Smith 1971) and of adults (Huizinga [1939] 1970; Caillois 1958; Sutton-Smith & Roberts 1963). Play is clearly intrinsically motivated. Whatever its evolutionary significance and adaptive value might be (Beach 1945; Bekoff 1972, 1978; Fagen 1981; Smith 1982), people play because it is enjoyable. My contribution to this literature in the late sixties was an article describing the historical changes in the way rock climbing has been practiced and experienced (Csikszentmihalyi 1969), and an embryonic model of the flow experience developed with H. Stith Bennett, who at that time was a student at Lake Forest College (Csikszentmihalyi & Bennett 1971).

By the early seventies, research on intrinsic motivation was gathering momentum at a few universities. The theoretical justification for this movement can be traced in part to D. O. Hebb's (1955, 1966) "optimal arousal hypothesis" that was extensively studied by Daniel Berlyne and J. McV. Hunt, among others (Hunt 1965; Berlyne 1960, 1966; Day, Berlyne, & Hunt 1971). This hypothesis was a way to account for laboratory experiments showing that even rats did not work exclusively to get food or to avoid shocks, but were also motivated by novelty, curiosity, and competence "drives" (Harlow 1953; Butler & Alexander 1955; White

1959). If any new stimulus could start complex exploratory behavior on the part of a monkey or a rat, this meant that the days when a few basic drives could account for everything an animal did were over. Among the influential statements that have supported this position were the volume edited by Fiske and Maddi (1961), the theoretical article by Dember (1974), and the review by deCharms and Muir (1978).

The first generation of researchers to focus directly on intrinsic motivation included Richard deCharms (1968, 1976), who earlier had investigated the achievement motive with David McClelland. His review of the literature on social motivation almost a decade ago (deCharms & Muir 1978) helped put the concept of intrinsic motivation on the intellectual agenda of psychologists. In his research, deCharms found striking differences among schoolchildren in terms of whether they did or did not feel in control of their lives. He called the first type "origins," because they believed that what they did was what they wanted to do; and he called the second type "pawns," because they felt that they were just being pushed around by outside forces. An important characteristic of the "origins" was their intrinsic motivation: Since they felt they owned their behavior, they took it more seriously and enjoyed it regardless of outside recognition. Indeed, deCharms hypothesized that in contrast to what drive theories might predict, if people were rewarded for doing things they had initially chosen spontaneously, their intrinsic motivation to do them would decrease.

At the University of Rochester, Edward Deci tested deCharms's prediction (1971, 1972, 1975). He found that if people were given money for doing things they enjoyed, they lost interest in those things faster than when they were not rewarded. Deci agreed with deCharms that under such conditions people came to see their involvement in the activity as being instrumental, controlled by external forces rather than freely chosen. Recognition of the reality of intrinsic motivation led Deci and his colleagues by an inevitable logic to investigations of autonomy and self-determination (Deci & Ryan 1985).

Mark Lepper's team of researchers at Stanford University discovered intrinsic motivation at about the same time. They were influenced by the social psychology of Heider (1958) and Kelley (1967, 1973), which ascribed greater importance to causal attributions than earlier cognitive theories of motivation had, and by the self-perception theory of Bem (1967, 1972), which assigns a similar autonomous power to the self construct. Studying children engaged in play activities, Lepper's team replicated and refined the overjustification findings, specifying the

conditions under which rewards interfere with behavior, and thus clarifying the dynamics of intrinsic motivation (Lepper, Greene, & Nisbett 1973; Greene & Lepper 1974; Lepper & Greene 1975). The literature on this topic was summarized in a volume appropriately entitled *The Hidden Costs of Reward* (Lepper & Greene 1978).

Thus by the early seventies there seemed to be enough of a theoretical rationale for believing that people were motivated to act by a much wider range of rewards than traditional psychology had suspected, and that many of these rewards were not based on prewired consummatory or homeostatic principles, like eating, having sex, or avoiding pain. But demonstrations of the importance of intrinsic rewards were still based on rather restricted laboratory settings, in which the behavior of small children was observed according to a few fixed experimental paradigms. Very little was known about intrinsic motivation in natural settings. No one knew whether the deep involvement artists experienced at their easels was a common occurrence among adults in other walks of life, and whether that involvement was the manifestation of an underlying experience so enjoyable as to be a reward in its own right.

The slowly cumulating research on intrinsic motivation differed from my own interests in another important respect. Lepper, Deci, deCharms and the other researchers in the field were interested primarily in intrinsically motivated *behavior* – in what made it happen and what its consequences were. They were inducing intrinsically motivated performance in laboratories, but they were not concerned about how the person so motivated was feeling. They were prepared to accept the existence of intrinsically motivated experience without wishing to know what it was; what they wanted to know was how it affected the subjects' task persistence or creativity. Although I, too, was interested in these issues, my first concern was about *the quality of subjective experience* that made a behavior intrinsically rewarding. How did intrinsic rewards *feel*? Why were they rewarding?

In order to answer these questions, I and my students, first at Lake Forest College and then at the University of Chicago, interviewed in depth over two hundred people who presumably would be familiar with intrinsic rewards. These were individuals who spent great amounts of time in strenuous activities for which they got no money and little recognition. They included amateur athletes, chess masters, rock climbers, dancers, high school basketball players, and composers of music. Basically what we wanted to find out was how such people described the activity when it was going particularly well.

The results of those studies constitute the first coherent statement about flow (Csikszentmihalyi 1974, 1975a, 1975b). They will not be summarized here, since a more systematic presentation of the flow model will be given in the next chapter. Their major contribution was to identify, across the widely diverse activities, a common experience that the respondents felt was *autotelic*, or rewarding in and of itself. Eventually we came to call this experience *flow*. The term had been used as a metaphor by some respondents to describe their feelings while involved in their favorite activities, and the short Anglo-Saxon word seemed preferable to the more clumsy, if more precise, term, *autotelic experience*.

After describing how it felt to be in a situation that was intrinsically motivating, we went on to explore the characteristics of those activities that provided intrinsic rewards. Again, despite the obvious difference between such endeavors as climbing rocks and writing music, a common set of structural characteristics was found to distinguish those patterns of action that produced flow from the rest of everyday life. The major implication of this aspect of the study was that not only play, leisure, or creative pursuits such as painting make flow happen. Intrinsic rewards can be built into any activity, including work.

The second decade: after 1975

The publication of *Beyond Boredom and Anxiety* did not attract much attention at the time, but the ideas contained in it slowly worked their way into a wide variety of academic and practical settings. The book has been reprinted three times so far, and it has been translated into Japanese (1979) and German (1985).

The most immediate impact was on those scholars who study the psychological and sociological implications of free time – on the literatures of play, sports, leisure, and recreation (e.g., Widmeyer 1978; Pearson 1979; Sutton-Smith 1979; Iso-Ahola 1980; Kleiber 1980, 1981, 1985, 1986; Kleiber & Barnett 1980; Egger 1981; Neulinger 1981a,b; Kelly 1982, 1986; Ingham 1986; Samdahl 1986). Several dissertations tested the concept and applied it to different populations. For instance, Gray (1977) developed a flow questionnaire and found it useful with a sample of older retired persons; Progen (1978) developed a questionnaire to be used in a variety of sports, as did Begly (1979) and Adair (1982).

To these fields the flow concept contributed one important insight: From the perspective of subjective experience, work and play are not

necessarily opposites. In order to define leisure, the quality of the experience might be a more valid guide than the nature of the activity. Many people derive greater rewards from their jobs than they do from free time. For them the traditional distinction between "work" and "leisure" makes little sense. If a person enjoys selling cars more than bowling, which activity is work for that person, and which leisure?

Cultural anthropology is another field to which the concept of flow turned out to be relevant. Here it was Victor Turner (1974b) who saw the similarity between the flow experience and a series of phenomena he had been studying for years, the so-called liminal situations. In a great variety of cultures, Turner found, normal social roles are occasionally suspended or even reversed in well-defined ritual situations. Some examples are rites of passage, pilgrimages, or more secular institutions like the carnival or the Christmas office party. The reason for having these reversals, according to Turner, is that while they last they provide participants with a feeling of *communitas*, an emotionally rewarding closeness comparatively free from the constraints of social roles and responsibilities. This feeling of participation in turn helps to cement the bonds of social solidarity after the episode ends.

Following Turner's lead, the flow concept became an influential idea in the anthropology of play (Cheska 1981; Harris & Park 1983). For instance, at the 1987 meeting of The Anthropological Association for the Study of Play held in Montreal, a symposium dedicated to flow dealt with the following subjects: the miniature world of chess in Washington Square Park in New York City (Francis 1987), a study of the emotional consequences of risk and competition (Hilliard 1987), a comparison of the flow theory with the Taoist philosophy of Chuang-tzu (Sun 1987), and an analysis of flow in television reporting (Zelizer 1987).

The similarity of flow to experiences reported in mystical and other religious contexts was also apparent (Carrington 1977). Therefore Mircea Eliade, who had accepted the task of editing a new *Encyclopedia of Religion* for the publishing house of Macmillan, commissioned for it an article on the flow experience (Csikszentmihalyi 1987a).

Early criticism of the concept had focused on its supposedly Western bias. Although its development had been influenced by Eastern sources such as the *Bhagavad Gita* and Zen, some critics felt that flow was too active and goal-directed a process to represent a panhuman, species-specific trait. In response to this criticism, the argument in favor of the universality of flow is that the specific *content of the activities* producing

flow vary from culture to culture; in the West, flow activities might indeed be on the whole more active, competitive, and controlling than in other parts of the world. But the *dynamics of the experience* that make enjoyment possible are presumably the same regardless of the culture. Several of the chapters in this volume support this argument. The studies of Sato with Japanese teenagers, of Han with Korean elderly, and of Massimini and his group with various European and Asiatic populations illustrate quite conclusively that the parameters of enjoyment are the same the world over.

Because flow occurs within the privacy of a person's consciousness, its implications for the discipline of sociology have been largely ignored. In an early review, Murray Davis (1977) compared the studies on flow with the work of the great sociologist of everyday life Erving Goffman (calling both of us mystics; but, the reviewer observed, whereas Goffman is a *pessimystic*, I am an *optimystic*). One sustained application of the flow concept to sociology was Richard Mitchell's book on mountain climbers (Mitchell 1983), a section of which appears as Chapter 3 in this volume. As Mitchell's work suggests, despite its subjectivity, flow might contribute to the understanding of many problems central to sociology. After all, alienation and anomie, two of the conceptual pillars of that discipline, are also subjective phenomena.

In the field of psychology, where the flow concept seems to belong more naturally, the impact has been proportionately greater. A fair amount has been written on flow as a useful idea, as an interesting phenomenon, and as a potentially important aspect of human life. One of the fields in which the impact of the concept has been substantial is the recently evolved literature on happiness or subjective well-being. In this line of investigation, the flow model is usually seen as the leading activity-based theory of happiness, often traced back to Aristotle's views (Diener 1984; Diener, Horwitz, & Emmons 1985; Argyle 1987). In comparison with the conceptual impact, the yield of empirical studies has thus far been rather meager. There have been exceptions, of course; some of the most noteworthy ones are included in the present volume.

As one would expect, researchers working in the field of intrinsic motivation became interested in the studies of flow primarily because for the first time the phenomenon was being looked at in natural settings (deCharms & Muir 1978; Amabile 1983; Deci & Ryan 1985). In the realm of more general psychological theory, Eckblad (1981) has tried to integrate flow with other motivational and cognitive models in a systematic fashion. In Germany Heinz Heckhausen has investigated the relation-

ship between achievement and intrinsic motives, with special reference to flow (see Aebli 1985).

Examples of laboratory studies influenced by the flow concept are the neurological investigations of Jean Hamilton, who found intriguing attentional patterns associated with the intensity of flow experiences (Hamilton 1976, 1981; Hamilton, Holcomb, & De la Pena 1977). Mannell (1979; Mannell & Bradley 1986) has conducted social-psychological experiments focusing on flow and other motivational concepts.

In our own laboratory at the University of Chicago, research on flow has become an integral part of every investigation being conducted. Thus the study of how urban Americans create a symbolic environment in their homes, reported in the volume *The Meaning of Things* (Csikszentmihalyi & Rochberg-Halton 1981), includes a chapter on flow. So do the study of teenage experience reported in *Being Adolescent* (Csikszentmihalyi & Larson 1984) and the study of television-viewing patterns contained in *Mirror of the Mind* (Kubey & Csikszentmihalyi, in press).

Perhaps the most interesting conceptual implication of flow has been in terms of a theory of sociocultural evolution. The link between a psychological selective mechanism, obeying its intrinsically motivated goal-seeking tendency, and cultural change was first perceived by Professor Fausto Massimini of the University of Milan. Our first article on the subject (Csikszentmihalyi & Massimini 1985) stimulated a vigorous debate that occupied much of three consecutive issues of the journal *New Ideas in Psychology* (1985, vol. 3, no. 2, 3; 1986, vol. 4, no. 1). Even earlier, J. Crook, the British ethologist, had perceived the evolutionary significance of flow in the concluding chapter of his *Evolution of Consciousness* (Crook 1980). Implications of the flow model for creativity and cultural evolution were more systematically explored in Csikszentmihalyi (1986, 1987b). A fuller treatment of this link may be found in Chapter 4.

Practical applications. The flow concept was developed as a result of sheer curiosity. It was the fruit of "pure" research, motivated only by the desire to solve an intriguing puzzle in the mechanism of human behavior. And, as many early critics were to point out, it was very ethereal, bordering on the mystical. It lacked the hard, concrete objectivity that a pragmatic psychological concept should have. Considering all this, it is in many ways astonishing that so many practical applications have been found for it.

One of the first arenas in which flow was seen to be potentially useful

was education. Mayers (1978) had shown that the degree to which high school students enjoyed a given course predicted their final grades better than previous measures of scholastic achievement or aptitude did. Looking at the problem from the other end, Plihal (1982) has shown that the amount of enjoyment teachers get from teaching is related to the amount of attention students show in class. In the Indianapolis public school system, a group of dedicated teachers at the "Key School" have implemented a K-6 curriculum based in part on the flow theory. There is certainly much that could be done to improve the educational process by increasing the enjoyment it potentially contains, but is so rarely part of the school experience (Csikszentmihalyi 1982b,c; Csikszentmihalyi & McCormack 1986). In the present volume, a number of chapters explore the contributions of the flow model to educational issues. Larson shows how boredom, anxiety, and enjoyment affect students' involvement in written research projects. Chapters by Carli et. al. and by Nakamura in Part IV illustrate the difference that flow makes in the scholastic achievement of Italian and American students.

The flow model is not only relevant to education in general, but also to various forms of special education. At Oklahoma State University, for example, the flow model has helped the faculty to develop a textbook and a summer course designed to train teachers of physically handicapped children to enjoy themselves despite their handicaps. Occupational therapy is another field where the model has had an impact and has informed the emerging field of "occupational science." At the other end of the continuum of special education, gifted children are being studied to see under which conditions they most enjoy using personal computers. Some implications of the flow model for learning and enjoying personal computers were explored by Malone (1980) and Turkle (1984).

In *Beyond Boredom and Anxiety* it was claimed that the most urgent applications of the flow model were in schools and on the job, where most people spend most of their lives – often in boredom or in states of uneasy anxiety. Therefore educational and occupational uses of the model seem to be the most urgent ones. In a series of studies on industrial accidents among factory workers in Hungary, I. Vitanyi and M. Sagi (personal communication) found that bored workers tended to take unreasonable risks and those who felt anxious complained of imaginary illnesses, whereas those who were able to derive enjoyment from the job were not only personally more satisfied but contributed much more to the productive goals of the factory. These researchers also related the

tendency to enjoy one's work to a variety of background factors, especially to patterns of family life and the uses of free time. Others have explored the potential of "flow management" by specifying the characteristics that would make an executive enjoy his or her job, as well as motivate the work force to enjoy theirs. For example, at the Institute of Organization and Social Studies of the University of West London, Gillian Stamp has applied the flow model to leadership development. Several management seminars in the United States now take the phenomenon into account in their curricula. The implications of optimal experience for consumer behavior have also been explored (Bloch & Bruce 1984; Bloch 1986).

In this volume, the enjoyment of work – or the lack of it – is a central theme of several chapters. It appears in Chapter 3, where Mitchell explores the sociological implications of anomie and alienation; in Chapter 7 by Allison and Duncan, which deals with working women; in Chapter 12 by Delle Fave and Massimini, who report on work and leisure in traditional societies; and in LeFevre's study (Chapter 18) of flow in the urban American work environment.

The most obvious – if perhaps in the long run not the most generative – applications of flow are in the context of play and leisure. In the late 1970s and early 1980s several groups experimenting with adult play therapies used the model in their activities. Bernard De Koven, a "game designer and play facilitator," integrated the flow model in the seminars he ran from his Game Preserve in Pennsylvania, and so did the New Games Foundation that had been started by Stewart Brand on the West Coast. Policy for recreational planning and the management of public parks has also been influenced by the concept (Berger & Schreyer 1986).

That psychotherapy could benefit from the flow perspective is something a few clinicians are beginning to entertain. Instead of focusing exclusively on past causes of malaise, this perspective would try to identify and to develop those actions and situations that provide the best subjective experiences. In this sense, flow provides to clinical psychology a standard of positive psychic functioning, analogous to the standard that physiology provides to pathology in the field of medicine (Massimini, Csikszentmihalyi, & Carli 1987). A similar idea informs the application of flow to a statewide antidrug campaign: The idea is to present youth with examples of "natural highs," of complex, involving experiences in productive contexts. An early paper on school crime and juvenile delinquency (Csikszentmihalyi & Larson 1978) had already suggested that much crime and vandalism are the result of boredom. Efforts

at various forms of rehabilitation appear to benefit from this view, and from the concrete features of the flow model that point at possible means of improvement. The first nationwide study of juvenile crime in Saudi Arabia, directed by Dr. Sharif Malik (1985), and the subsequent policies deriving from the study were informed by flow theory. In this volume, the chapter by Sato represents one of the applications of the flow model to the study of deviance.

Other applications have ranged from advertising research to the design and redesign of museums. Ken Davis (1988) has written a book in which the flow model is used to help audiences become involved with the theater. Whenever the quality of human experience is at issue, flow becomes relevant. It helps explain why people enjoy their work and their leisure; it also helps explain why in some circumstances people are bored and frustrated. When boredom becomes a major part of life, it helps explain the alienation and apathy underlying much of personal pathology and some of the societal forms as well.

The pages that follow present some of the most stimulating conceptual extensions of the original flow model together with a selection from the research that in the past decade has rounded out our understanding of the conditions that make an enjoyable life possible. The chapters cover a broad range of human experience from work to play to deviant behavior and include studies of men and women, young and old, and Western and Eastern samples. They illustrate the enjoyment – or lack of it – reported by cleaning women in their humble jobs and by sailors cruising their yachts on the South Seas. Despite its breadth, this volume represents only the barest beginning in a field of research and application that eventually will, we hope, grow much larger. The flow model opens up a new perspective on some of the most exciting aspects of human experience. The challenge lies in exploring this fascinating view in order to make life more worthwhile. We hope that at least a few readers will put down this book with a resolution to take up that challenge.

2. The flow experience and its significance for human psychology

MIHALY CSIKSZENTMIHALYI

In the ordinary course of events, psychologists observe human action either in clinical settings, where the “patient” is seeking therapeutic redress for some impairment, or in experimental settings, where the confines of the laboratory and the parameters of the experimental design allow only a tiny fraction of potential responses to be manifested. The theoretical models of human action that psychologists have constructed in the past half century reflect this poverty of observational data: They tend to be mechanistic, reductive, and biased in favor of pathology.

To provide a more complete view of what human behavior and experience entail, it is necessary to begin observing what people do and what happens to them when they are not confined to the couch or the laboratory, but are involved in their normal lives in real ecological settings. In particular, it is important to observe them in those moments when their lives reach peaks of involvement that produce intense feelings of enjoyment and creativity. Without accounting for these aspects of experience, models of human behavior will remain one-sided and incomplete. The studies of the flow experience included in this volume attempt to provide evidence on which a more realistic model of human behavior can be built.

The major psychological trends of this century – including drive theories, psychoanalysis, behaviorism, cognitive psychology, and the contemporary atheoretical neuropharmacological approaches – all share a common epistemology. In an attempt to be as scientific as possible, they have developed reductionistic accounts of human action, discounting or ignoring the most obvious aspect of the human phenomenon, namely, the existence of a conscious self. To explain away reflective awareness, with all its implications, might have seemed like a wise strategic move. By ignoring the self as an agent in its own right it seemed possible to

develop a psychology as concretely based on impersonal processes as mechanics and physics.

The "billiard ball" metaphor of behavior is the standard view of human motivation underlying these approaches. A person's actions are explained entirely in terms of the vector sum of discrete forces external to the individual self. Given condition *X*, one expects behavior *Y*. The *Xs* specified by each theory are different: They might include psychopharmacological conditions, internal drive states like hunger, or they might consist of external rewards, or of interactive concepts like libidinal repression. But in each case, the effort of modern psychology has been to specify the *Xs* that are independent of the subjective states of the experiencing organism. Only by holding to the notion of external agents (hormones, drives, instincts, learning schedules, and so on) that act invariably in a predictable direction with a minimum of interference from the subject who is the object of their agencies, did the project of a scientific psychology seem tenable.

To a certain extent, this reductionistic project makes sense. After all, it is in general true that men and women begin to search for food when the sugar level in their blood falls below a certain point. It is true that they will quickly learn to perform acts for which they are rewarded, and that they tend to desist from those actions that bring punishment in their wake. The power of sexual drives, and of their repression, is equally beyond doubt.

Yet, despite the preponderant evidence in its favor, reductionist psychology fails as an accurate theory of human behavior because it ignores the phenomenon of the self. Thus it cannot account for those rare but extremely significant instances in which people decide to contradict those "forces" that in ordinary circumstances appear to determine their behavior. It does not explain, except by convoluted ad hoc arguments that end up begging the question, why people fast and occasionally starve themselves to death, why they sometimes lead celibate lives, and why they often do exactly the opposite of what they have always learned and been rewarded for.

The fact is that people do what they want to do, and what they want to do does not depend directly on outside forces, but it depends on priorities established by the needs of the self. Thus motivation cannot be reduced to causes at a lower – or different – order of organization than the self of the subject. The reason it appears that so much about human behavior can be accounted for by simpler mechanisms – such as drives, stimulus–response sequences, and the like – is that people *want*

to act in terms of the instructions such mechanisms convey. In general, people *want* to eat when they are hungry; they *want* to work hard if they are rewarded for it, and so on. But it is an excessive simplification to deduce from these regularities that humans simply follow the instructions contained in their genes or in the conditioning they receive. It is more accurate to say that these lower-order mechanisms determine the organization of the self, but once the self is operational, it becomes an independent causal agent, taking over from drives or stimulus-response links the direction of human behavior.

The human organism cannot survive as a bundle of neural reflexes, or even of stimulus-response learning pathways. In order to perform within the infinitely complex ecosystem to which it became adapted, it needed to establish autonomy from the genetically determined instructions that had shaped its behavior through the long eons of its evolution.

The system that has evolved to provide this autonomy is the self. The function of the self is to mediate between the genetic instructions that manifest themselves as "instinctual drives" and the cultural instructions that appear as norms and rules. The self must prioritize between these various behavioral instructions and select among them the ones it wants to endorse.

The structure of consciousness

In order for the self to mediate between these often conflicting instructions, the human organism had to develop another feature, an informational system that could differentiate among a great variety of stimuli, that could choose certain stimuli and focus selectively on them, and that could store and retrieve the information in a usable way. This feature, based on the biological evolution of the central nervous system, we call *consciousness*. It is composed of three functional subsystems: attention, which takes notice of information available; awareness, which interprets the information; and memory, which stores the information (Broadbent 1958; Pope & Singer 1978). The content of consciousness is experience, that is, the sum of all the information that enters it, and its interpretation by awareness (James 1890).

Attention is the medium that makes information appear in consciousness. The human organism is limited to discriminating a maximum of about seven bits – or chunks – of information per unit of time (Miller 1956). Orme (1969), on the basis of von Uexkull's (1957) computations, estimates the duration of such an "attentional unit" to be on the order

of 1/18th per second; in other words, we can become aware of 18×7 bits of information, or 126 bits, in the space of a second. Thus a person can process at most in the neighborhood of 7,560 bits of information each minute. In a lifetime of 70 years, and assuming a waking day of 16 hours, this amounts to about 185 billion bits of information. This number defines the limit of individual experience. Out of it must come every perception, thought, feeling, memory, or action that a person will ever have. It seems like a large number, but in actuality most people find it tragically insufficient.

To get a sense of how little we can actually accomplish with the amount of attention at our disposal, we might consider how much attention it takes to follow an ordinary conversation. It is claimed that to extract phonemic information from speech signals would take 40,000 bits of information per second if each bit had to be attended to separately; fortunately, our species-specific genetic programming allows us to chunk speech into phonemes automatically, thereby reducing the load to 40 bits per second – or approximately one-third of the total processing capacity of attention (Lieberman, Mattingly, & Turvey 1972; Nusbaum & Schwab 1986). This is why we cannot follow a conversation and at the same time do any other involving mental task, like writing a letter, playing chess, or playing tennis. Just decoding what other people are saying, even though apparently an effortless and automated process, interferes with any other task that requires one's full attention.

Finitude is one of the most important characteristics of attention. In reviewing Kahneman's (1973) pioneering book on the subject, Norman (1976, p. 71) writes:

The limit on attentional capacity appears to be a general limit on resources. . . . The completion of a mental activity requires two types of input to the corresponding structure: an information input specific to that structure, and a non-specific input which may be variously labeled "effort," "capacity," or "attention." To explain man's limited ability to carry out multiple activities at the same time, a capacity theory assumes that the total amount of attention which can be deployed at any time is limited.

Similarly, Hasher and Zacks (1979, p. 363) write: "Consistent with a capacity view of attention, we think of attention as a nonspecific resource for cognitive processing. This resource is necessary for the carrying out of mental operations, but its supply is limited." And Eysenck (1982, p. 28) states: "The original notion of attention has been replaced by a

conceptualization in which attention is regarded as a limited power supply. The basic idea is that attention represents a general purpose limited capacity that can be flexibly allocated in many different ways in response to task demands."

Because attention is the medium that makes events occur in consciousness, it is useful to think of it as "psychic energy" (Kahneman 1973; Csikszentmihalyi 1978a; Hoffman, Nelson, & Houck 1983). Any nonreflex action takes up a certain fraction of this energy. Just listening to an ordinary conversation closely enough to understand what is being said takes up one-third of our psychic energy at any given time. Stirring a cup of coffee, reaching for a newspaper, trying to remember a telephone number – all require information-processing space out of that limited total. Of course individuals vary widely in terms of how much of their psychic energy they actually use (i.e., how many bits of information they process), and in terms of how they invest the energy they do use.

We shall use "awareness" to designate all those processes that take place in consciousness after a bit of information is attended to. It includes such steps as recognizing the stimulus, categorizing it in terms of previous information, and disposing of it either by preserving it in memory or by forgetting it. Some of the most important processes of awareness are thought or cognition, feeling or emotion, and conation or volition (Hilgard 1980). Cognition refers to the various steps by which bits of information are recognized and related to each other. Emotion defines the attitude that consciousness takes toward the information it is processing, basically in terms of an "I like it" to "I do not like it" axis. Volition is the process by which attention remains focused on a certain range of stimuli, instead of moving on to other targets (M. Csikszentmihalyi 1986). All of these processes of awareness require attention for their implementation, and thus they are also "information" in consciousness, subject to the same limitations of information processing already discussed (Neisser 1967; Treisman & Gelade 1980; Treisman & Schmidt 1982; Hoffman, Nelson, & Houck 1983). In other words, one cannot think, feel, and will in relation to more than a few stimuli at the same time.

The memory subsystem stores information that has passed through consciousness, and that can be again recalled. It provides consciousness with access to far more than the 126 bits of information per second that the limits of attention restrict it to. Yet storing and recalling information

also make demands on attention, so memory has its own limits (Atkinson & Shiffrin 1968; Shiffrin 1976; Hasher & Zacks 1979; Neisser, Hirst, & Spelke 1981; Nusbaum & Schwab 1986).

These three subsystems – attention, awareness, and memory – allow consciousness to act as a buffer between genetic and cultural instructions on the one hand, and behavior on the other. By transforming physiological processes into subjective experiences, consciousness makes it possible to gain control over the anonymous instinctual forces.

At a certain point in ontogenesis, each individual begins to realize his or her own powers to direct attention, to think, to feel, to will, and to remember. At that point, a new agency develops within awareness. This is the *self*. The self is simply an epiphenomenon of conscious processes, the result of consciousness becoming aware of itself. The structure of the self gains shape as information related to one's body, one's past memories, and future goals. Eventually the scope of the self extends to cover the entirety of consciousness. At that point, the self becomes the symbol that stands for the full range of the individual's conscious processes – including those unconscious contents that occasionally surface in awareness.

Like every system, the main function of the self, once it is established, becomes to maintain itself, and possibly to grow and to replicate. Once the human nervous system evolved consciousness, it made the development of the self inevitable. And as soon as the self evolved in its turn, the control that genetic instructions had on man was broken (Dawkins 1976; Crook 1980; Csikszentmihalyi & Massimini 1985). The self could now choose to act in ways that went against the millennial wisdom that natural selection had built into the biological fabric of the species. The self could be selfish or selfless, regardless of the wishes of the selfish genes that made its existence possible.

For example, if I were to feel hunger, and I had no consciousness, I would immediately be directed by a loop in my nervous system to begin searching for food. Most psychological theories assume that this more or less is what happens with humans. But what actually happens is that, as the pangs of hunger enter consciousness, I evaluate the information, give it a name (e.g., "Gee, I feel hungry"), and then decide what to do about it. Nine times out of ten, I will start seeking food, just as if I had no consciousness and genetic instructions regarding hunger had a direct control over my behavior. On the other hand, if my self had become organized around the goal of becoming slimmer, I might decide to skip

a meal in order to lose some weight; or, if my self had become identified with the goal of being a traditional Catholic and it was Friday, I might decide to fast; or I might decide not to eat so as to save money, or for any of a hundred reasons that at that moment are more congruent with the goals of the self and thus take precedence over the biological instructions contained in my genes.

Consciousness provides the same buffering function between cultural instructions and behavioral outcomes. In every society, social controls provide a network of rewards and punishments that are expected to force individual behavior in conformity with the norms that ensure the continued survival of the system. Here again, nine times out of ten one can predict that behavior will follow relevant norms. But here also each individual has the potential to override socialization because consciousness transforms cultural instructions into experience, and as such it can deal with experience in the same detached way that it can with genetic drives. Consciousness frees the organism from its dependence on the forces that created it, and provides a certain control – however feeble and precarious it is – over our behavior. Whatever can be represented in consciousness can potentially be controlled through the investment of attention, or psychic energy.

From an evolutionary standpoint, the self is a very chancy mutation. Its advantages are clear: By acting as a clutch between programmed instructions and adaptive behaviors, it enormously increases the possibilities of a fit between the two. There is no longer any need to develop laborious genetic links between certain types of stimuli and certain desirable responses; consciousness can fill in the linkages symbolically. We do not need, for example, thousands of separate warning systems specialized for every environmental danger; a generalized “instinct” for self-preservation can do most of the job. Control over experience brought with it control over thought, emotion, and will; eventually it made mankind one of the most powerful natural forces on the planet.

Clearly, there is also a negative side. In operating as a clutch, consciousness has disengaged us from the forces that have guided evolution up to this point. We are no longer forced to act blindly, but it is by no means certain that the choice and control we have wrested will serve us better than the blind instructions of our genes used to do. In fact, it is very possible that the self, drunk with its sense of self-importance, will end up destroying the environment that brought it about and thereby end life on earth.

The teleonomy of the self

Once the self becomes established in consciousness, its main goal is to ensure its own survival. To this effect, attention, awareness, and memory are directed to replicate those states of consciousness that are congenial to the self, and to eliminate those that threaten its existence.

The self represents its own interests as *goals*. Each self develops its own hierarchy of goals, which become, in effect, the structure of that self. Whenever a new experience enters consciousness it is evaluated in terms of the goals that reflect the self, and it is dealt with accordingly. A bit of information that fits these goals strengthens the structure of the self, whereas one that conflicts with them creates disorder in consciousness and threatens the integrity of the self. We receive most goals from the genetic instructions of our biological inheritance, or from the cultural instructions embodied in societal values. But here, too, consciousness allows our choices a certain autonomy and independence.

We use the term *psychic entropy* to refer to those states that produce disorder by conflicting with individual goals (Csikszentmihalyi 1978a; 1985a). Psychic entropy is a condition in which there is "noise" in the information-processing system. It is experienced as fear, boredom, apathy, anxiety, confusion, jealousy, and a hundred other nuances, depending on the nature of the information and the kinds of goals the information is in conflict with. For example, the sight of a thunderstorm on a morning I planned a picnic produces a mild frustration commensurate to the amount of psychic energy I had invested in the goal of having the picnic. The same sight might produce panic in a farmer who had a great deal of money and energy invested in a harvest that is threatened by the storm.

Psychic entropy not only causes disorder in consciousness, but it impairs its efficiency as well. Attention is withdrawn from other tasks to deal with the conflicting information. Intense physical pain, for example, prevents us from thinking about anything else. But so does any threat to the self, even of a symbolic nature. An imagined slight, a breach of protocol can have equally paralyzing effects.

The state of mind described here as psychic entropy is of course well known both to common sense and to psychology, but its nature has not been clearly understood, for lack of a viable theory of self. It is true that in the past few decades a number of psychologists have conducted extensive studies of basic emotions or primary affects such as anger,

distress, sadness, fear, shame, contempt, and disgust (Tomkins 1962, 1963; Ekman 1972; Izard 1977; Izard, Kagan, & Zajonc 1984; Frijda 1986). But these investigators generally assume that each emotion is separately "wired in" as a response to a specific set of stimuli, instead of being an integrated response of the self system. As a result we know a great deal about negative emotions, but the information has little theoretical coherence. A partial exception is the work of Bandura (1977, 1978) and Bandura and Schunk (1981), whose concept of "self-efficacy" provides a possible model for a more unified understanding of negative as well as positive experience.

In clinical psychology and psychiatry "dysphoric moods" are recognized as markers of depression and other pathological mental states (Beck 1967, 1976; Blumberg & Izard 1985). That negative moods interfere with concentration, ease of concentration, and a sense of control has often been reported (Hamilton 1982). However, the extensive clinical literature on the subject is generally interested in dysphoria as a personal trait that differentiates normal from ill people, rather than as a condition that affects everybody under certain conditions. Current explanations include the "activity theory," according to which people suffer from negative moods because they engage in fewer pleasant activities (Lewinsohn & Libet 1972) and because they perceive activities as potentially less pleasurable (MacPhillamy & Lewinsohn 1974); and the "learned helplessness" (Seligman 1975) or "attributional" theories, according to which people prone to depression blame themselves for the occurrence of unpleasant events (Seligman et al. 1984). Finally, a number of psychopharmacological approaches have attempted to ameliorate the symptoms of depression and dysphoria through chemical means (e.g., Murphy, Simons, Wetzel, & Lustman 1984). None of these perspectives, however, views the person who experiences bad moods as a total system, a self that is actively trying to establish order in the contents of consciousness.

In social psychology, Festinger (1954) and others have described conflict in the information being processed by persons, and thus they are potentially closer to a systemic description of what we have termed "psychic entropy." But their analysis also leaves out the concept of self, and the dissonance they talk about ends up being one-dimensional, confined only to cognitive aspects. Cognitive scientists and students of artificial intelligence, who also study the dynamics of information in consciousness, are even more focused on the rational aspects of infor-

mation and thus leave out the dimensions of affect and motivation, which are central to the operations of the self (Mandler 1975; Piaget 1981; Zajonc 1984).

Even less is known about the state of consciousness that is at the opposite end of the pole from the negative one just described (Leeper 1965; Izard 1971; Singer 1984). This is the condition we have called psychic negentropy, optimal experience, or *flow* (Csikszentmihalyi 1975b). It obtains when all the contents of consciousness are in harmony with each other, and with the goals that define the person's self. These are the subjective conditions we call pleasure, happiness, satisfaction, enjoyment. Because the tendency of the self is to reproduce itself, and because the self is most congruent with its own goal-directed structure during these episodes of optimal experience, to keep on experiencing flow becomes one of the central goals of the self.

This is the *teleonomy of the self*, that is, the goal-seeking tendency that shapes the choices we make among alternatives. It is the third set of rules that affects the course of human action, the others being the genetic teleonomy, or the tendency of biological patterns to replicate their kind across time, and cultural teleonomy, which tends to impose social norms and values on human behavior in order to replicate itself across generations (Massimini & Calegari 1979; Csikszentmihalyi & Massimini 1985; Massimini & Inghilleri 1986).

Genetic and cultural teleonomies are well known to social science, and their effects on behavior have been extensively studied. Very little is known, on the other hand, about the teleonomy of the self. What is it that people do to fulfill their being? This is the question that the present volume addresses.

Pleasure and the genetic teleonomy. Of all the ways to build a self around a hierarchy of goals, the most "natural," and hence phylogenetically the most primitive, is to endorse consciously the genetic teleonomy. This means, very simply, that the person identifies his or her goals with the genetic instructions programmed in his or her organism. The person's ultimate goals will center around eating well and being comfortable, healthy, and sexually satisfied.

It is important to note, however, that, when these "drives" become goals, they cannot be satisfied any longer by restoring physiological homeostasis. A person will keep eating even after he or she is no longer hungry, because food is required not just to keep the body in fuel, but

also to keep the self in an ordered state. Thus the satisfaction of biological needs becomes necessary for the continuity of the self.

Although genetic instructions form the basis for all human goal hierarchies, the exclusive pursuit of pleasure cannot lead to evolutionary development, and it is detrimental to any form of social order. Most religious and ethical systems warn against building selves on purely genetic goals. The Christian "sins," such as gluttony, lechery, greed, and intemperance, describe selves built primarily around genetically programmed pleasure.

Habits leading to substance addiction follow the same pattern. If experiencing pleasure is the only way to maintain the order of the self, then drugs and alcohol become perfectly appropriate means for doing so. Thus a self originally organized around the pleasure principle might end up by working against the genetic teleonomy whose cause it had originally espoused. Excessive sexual indulgence does not lead necessarily to procreation, and gluttony can soon become unhealthy. When a physiological need becomes a goal, it ceases to be under the exclusive control of its original genetic instructions and begins to follow the teleonomy of the self.

Power and cultural teleonomy. In addition to endorsing the genetic teleonomy, the self can also be organized around cultural instructions. Every human group, no matter how small and simple, has a set of goals aimed at ensuring its own continuity. These are the norms or rules without which the social system would lose its identity and decay into a crowd engaged in a "war of all against all." A central feature of every social organization is a hierarchy that differentiates power relationships among people in different statuses.

Social differentiation is itself genetically based. Social insects are anatomically differentiated to facilitate the performance of their specialized functional roles (Wilson 1975). Dominance-submission hierarchies seem to be present in all socially living primates. Already during the first year of life, human infants placed in a playpen begin to show differential access to toys, and thus create spontaneously the rudiments of social stratification, with the familiar Marxist differentiation between those who control resources and those who do not. By six years of age quite stable and generally accepted rankings in "toughness" develop among boys (Freedman 1979, 1984; Omark, Strayer, & Freedman 1980).

The more complex the social system – the more statuses and roles it contains – the more markers of differentiation it will have to use (Davis

& Moore 1945). Eventually the social hierarchy becomes relatively autonomous of biological instructions and starts to motivate people to act in terms of its own mechanisms of social control, by offering rewards and punishments to those who abide by its norms.

What we know of present preliterate societies suggests that through the evolution of social systems persons who achieved higher positions in the hierarchy usually had above-average organizational or economic skills, and they were given a proportionately greater share of power and respect in their communities. In turn, they were expected to use their skills to benefit the group. The leader of the hunt had to give from his greater share to the hungry; the richest landowners had to save their surplus for times of famine and then open their storehouses to the community; the wise shaman had to be available for consultation when a member of the tribe needed the help of magic.

With time, it seems that social recognition has become programmed as a reward in the human nervous system. Men and women find it pleasant when others recognize their selves by paying attention to them. On the other hand, solitude is for most people a painful state to be avoided at all cost (Fortune 1963; Bowen 1954; Peplau & Perlman 1982).

It is not our task here to debate whether social differentiations are actually functional. The fact is that they exist among the headhunters of New Guinea and in the Soviet Union as well as in capitalist societies. What is relevant in this context is that people consciously internalize the social hierarchy and make it their own. Thus a person, having enjoyed attention and respect from others, will try to replicate the internal harmony of the self by reproducing the conditions conducive to it. After a certain time, the self of this person will require continuous inputs of social recognition in order to maintain its integrity.

What form this seeking for recognition will take depends on several things, especially on the normative structure of the social system. In a community of warriors, a person might have to display increasing violence to be recognized, whereas in a community of monks recognition will come to the most peaceful. In New Guinea respect and power go to the man who owns most pigs and yams. In our society the principle is more or less the same, although among us money acts as a mediator of possession.

As with the endorsement of biological drives, a teleonomy of self based on social instructions can easily get out of hand. When it is power that keeps the self in a negentropic state, a new "fix" is needed constantly, regardless of the requirements of the community. Thus the individual's

hunger for recognition often conflicts with the harmony of the social order.

Another way to build a self in relation to instructions endorsed by the social system involves becoming part of the social order rather than controlling it. Instead of moving up the social hierarchy, the goal here is to merge one's being with that of a greater force. The self loses its autonomy in the process, but in exchange gains identification with a larger, more powerful entity.

The "oceanic feeling" of infancy (Freud 1961; Winnicott 1951) is a pleasurable state that persists in adulthood as the "collective effervescence" that takes over in ritualized social situations (Durkheim [1912] 1967), or as the sense of "communitas" that is so enjoyable when social roles are temporarily suspended (Turner 1969). To replicate such nentropic experiences, the self may direct consciousness to seek out conditions of this type again and again.

Thus the teleonomy of the self might be constructed primarily around goals that involve participation. These could range all the way from becoming a communist believer to becoming a Hindu mystic; although vastly different in many respects, both choices involve abnegation of other goals in order to experience belonging with a powerful transpersonal system. The faithful employee, the patriotic citizen, the religious zealot, the sports fan, the intellectual snob are other manifestations of the same solution.

Again, it is important to remember that such sacrifices of individuality are not necessarily what they appear to be. The behavior of the person who takes such a course of action is not under the control of the transpersonal system. It still follows the teleonomy of the self, even when it appears to be entirely selfless. The hero who is willing to die for his country may not be primarily concerned with the best interests of the majority of his compatriots; his primary concern may be to keep his self in greatest harmony. Hence it is perfectly possible that some of the most "selfless" participants in a given system will actually help to destroy it, since their need to replicate a sense of belonging takes precedence over the system's needs.

Flow: the emergent teleonomy of the self. Pleasure, power, and participation are some of the basic models on which a self can be built. It is probably the case that each person uses all three of these kinds of goals, in various combinations, and in various degrees of intensity, to shape consciousness.

But if these were the only sources of motivation, human behavior would remain the same over time. Yet consciousness evolves. Over the course of centuries, attention has become focused on more and more differentiated stimuli. Individuals today may not be able to process more discrete bits of information than their ancestors did a million years ago. But they certainly have access to a great deal more information than their ancestors had, because the extrasomatic memory system of the species – such as books, museums, laboratories, and computer files – has expanded dramatically.

Systems for knowing have also evolved. Entirely new epistemologies, techniques, and intellectual disciplines have arisen over time, and their cumulative algorithms have made the manipulation of information more complex than it has ever been.

The same is true for the development of noncognitive skills. Perhaps an average Cro-Magnon man was able to adapt to more aspects of his environment than an average urban American can. It could be argued that he had to know how to use his body, his mind, and his hands in more complex ways. But there is no question that the cumulative adaptations of contemporary technology are immeasurably more complex than they were even a few decades ago.

It is equally clear that emotions and feelings have evolved with time. Again, it might not be true that a randomly chosen person from a large modern city would have a broader repertoire of feelings or would display a more complex emotional response than a Renaissance citizen, or a Medieval peasant, or a Phoenician trader, or a Paleolithic hunter. But the variety of sensibilities available to us is again unprecedented in any prior age. Each of us can choose and combine the emotional responses of Zen monks and of the Marquis de Sade, of vegetarians, of aesthetes, of utter materialists, and of the most refined idealists.

To explain how consciousness has evolved through time, in addition to the models considered earlier, it is necessary to recognize an emergent teleonomic principle of the self. Pleasure, power, and participation are not enough to account for the dazzling variety of new goals that people constantly adopt and pursue. The motivation to go beyond established patterns of behavior is due to an organizing principle of a different kind.

In our everyday activities, either by chance or by design, we come in contact with experiences that we have never been exposed to before. Occasionally the experience is one that was previously never had by a human being. For instance, when the Montgolfier brothers first left the earth in a balloon, or when the first swimmer with an oxygen tank started