

The Concept of Flow

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What constitutes a good life? Few questions are of more fundamental importance to a positive psychology. Flow research has yielded one answer, providing an understanding of experiences during which individuals are fully involved in the present moment. Viewed through the experiential lens of flow, *a good life is one that is characterized by complete absorption in what one does*. In this chapter, we describe the flow model of optimal experience and optimal development, explain how flow and related constructs have been measured, discuss recent work in this area, and identify some promising directions for future research.

Optimal Experience and Its Role in Development

The Flow Concept

Studying the creative process in the 1960s (Getzels & Csikszentmihalyi, 1976), Csikszentmihalyi was struck by the fact that when work on a painting was going well, the artist persisted single-mindedly, disregarding hunger, fatigue, and discomfort—yet rapidly lost interest in the artistic creation once it had been completed.

Flow research and theory had their origin in a desire to understand this phenomenon of intrinsically motivated, or *autotelic*, activity: activity rewarding in and of itself (*auto* = self, *telos* = goal), quite apart from its end product or any extrinsic good that might result from the activity.

Significant research had been conducted on the intrinsic motivation concept by this period (summarized in Deci & Ryan, 1985). Nevertheless, no systematic empirical research had been undertaken to clarify the *subjective phenomenology* of intrinsically motivated activity. Csikszentmihalyi (1975/2000) investigated the nature and conditions of enjoyment by interviewing chess players, rock climbers, dancers, and others who emphasized enjoyment as the main reason for pursuing an activity. The researchers focused on play and games, where intrinsic rewards are salient. Additionally, they studied work—specifically, surgery—where the extrinsic rewards of money and prestige could by themselves justify participation. They formed a picture of the general characteristics of optimal experience and its proximal conditions, finding that the reported phenomenology was remarkably similar across play and work settings. The conditions of flow include:

- Perceived challenges, or opportunities for action, that stretch (neither overmatching nor underutilizing) existing skills; a sense that one is engaging challenges at a level appropriate to one's capacities
- Clear proximal goals and immediate feedback about the progress that is being made.

Being "in flow" is the way that some interviewees described the subjective experience of engaging just-manageable challenges by tackling a series of goals, continuously processing feedback about progress, and adjusting action based on this feedback. Under these conditions, experience seamlessly unfolds from moment to moment, and one enters a subjective state with the following characteristics:

- Intense and focused concentration on what one is doing in the present moment
- Merging of action and awareness
- Loss of reflective self-consciousness (i.e., loss of awareness of oneself as a social actor)
- A sense that one can control one's actions; that is, a sense that one can in principle deal with the situation because one knows how to respond to whatever happens next
- Distortion of temporal experience (typically, a sense that time has passed faster than normal)
- Experience of the activity as intrinsically rewarding, such that often the end goal is just an excuse for the process.

When in flow, the individual operates at full capacity (cf. de Charms, 1968; Deci, 1975; White, 1959). The state is one of dynamic equilibrium. Entering flow depends on establishing a balance between perceived action capacities and perceived action opportunities (cf. optimal arousal, Berlyne, 1960; Hunt, 1965). The balance is intrinsically fragile. If challenges begin to exceed skills, one first becomes vigilant and then anxious; if skills begin to exceed challenges, one first relaxes and then becomes bored. Shifts in subjective state provide feedback about the changing relationship to the environment. Experiencing anxiety or boredom presses a person to adjust his or her level of skill and/or challenge in order to escape the aversive state and reenter flow.

The original account of the flow state has proven remarkably robust, confirmed through studies of art and science (Csikszentmihalyi, 1996), aesthetic experience (Csikszentmihalyi & Robinson, 1990), sport (Jackson, 1995, 1996),

literary writing (Perry, 1999), and other activities. The experience is the same across lines of culture, class, gender, and age, as well as across kinds of activity.

Flow research was pursued throughout the 1980s and 1990s in the laboratories of Csikszentmihalyi and colleagues in Italy (e.g., Csikszentmihalyi & Csikszentmihalyi, 1988; Inghilleri, 1999; Massimini & Carli, 1988; Massimini & Delle Fave, 2000). The research in Italy employed the Experience Sampling Method (ESM), using pagers to randomly sample everyday experience. It yielded several refinements of the model of experiential states and dynamics in which the flow concept is embedded. The ESM and the theoretical advances that it made possible are discussed in the section on measuring flow.

During the 1980s and 1990s, the flow concept also was embraced by researchers studying optimal experience (e.g., leisure, play, sports, art, intrinsic motivation) and by researchers and practitioners working in contexts where fostering positive experience is especially important (in particular, formal schooling at all levels). In addition, the concept of flow had growing impact outside academia, in the spheres of popular culture, professional sport, business, and politics.

In the 1980s, work on flow was assimilated by psychology primarily within the humanistic tradition of Maslow and Rogers (McAdams, 1990) or as part of the empirical literature on intrinsic motivation and interest (e.g., Deci & Ryan, 1985; Renninger, Hidi, & Krapp, 1992). In recent years, a model of the individual as a proactive, self-regulating organism interacting with the environment has become increasingly central in psychology (for reviews, see Brandstätter, 1998; Magnusson & Stattin, 1998). This is highly compatible with the model of psychological functioning and development formed in concert with the flow concept (Csikszentmihalyi & Rathunde, 1998; Inghilleri, 1999).

A key characteristic that the flow model shares with these other contemporary theories is *interactionism* (Magnusson & Stattin, 1998). Rather than focusing on the person, abstracted from context (i.e., traits, personality types, stable dispositions), flow research has emphasized the dynamic system composed of person and environment, as well as the phenomenology of person-environment interactions. Rock climbers, surgeons, and others who routinely find deep enjoyment in an activity illustrate how an organized set of challenges and a corresponding

set of skills result in optimal experience. The activities afford rich opportunities for action. Complementarily, effectively engaging these challenges depends on the possession of relevant capacities for action. The effortless absorption experienced by the practiced artist at work on a difficult project always is premised upon earlier mastery of a complex body of skills.

Because the direction of the unfolding flow experience is shaped by both person and environment, we speak of *emergent motivation* in an open system (Csikszentmihalyi, 1985): what happens at any moment is responsive to what happened immediately before within the interaction, rather than being dictated by a preexisting intentional structure located within either the person (e.g., a drive) or the environment (e.g., a tradition or script). Here, motivation is emergent in the sense that *proximal goals* arise out of the interaction; later we will consider the companion notion of emergent long-term goals, such as new interests.

In one sense, an asymmetry characterizes the person-environment equation. It is the *subjectively perceived* opportunities and capacities for action that determine experience. That is, there is no objectively defined body of information and set of challenges within the stream of the person's experience, but rather the information that is selectively attended to and the opportunities for action that are perceived. Likewise, it is not meaningful to speak about a person's skills and attentional capacities in objective terms; what enters into lived experience are those capacities for action and those attentional resources and biases (e.g., trait interest) that are engaged by this presently encountered environment.

Sports, games, and other *flow activities* provide goal and feedback structures that make flow more likely. A given individual can find flow in almost any activity, however—working a cash register, ironing clothes, driving a car. Similarly, under certain conditions and depending on an individual's history with the activity, almost any pursuit—a museum visit, a round of golf, a game of chess—can bore or create anxiety. *It is the subjective challenges and subjective skills, not objective ones, that influence the quality of a person's experience.*

Flow, Attention, and the Self

To understand what happens in flow experiences, we need to invoke the more general

model of experience, consciousness, and the self that was developed in conjunction with the flow concept (Csikszentmihalyi & Csikszentmihalyi, 1988). According to this model, people are confronted with an overwhelming amount of information. *Consciousness* is the complex system that has evolved in humans for selecting information from this profusion, processing it, and storing it. Information appears in consciousness through the selective investment of *attention*. Once attended to, information enters *awareness*, the system encompassing all of the processes that take place in consciousness, such as thinking, willing, and feeling about this information (i.e., cognition, motivation, and emotion). The *memory* system then stores and retrieves the information. We can think of *subjective experience* as the content of consciousness.

The *self* emerges when consciousness comes into existence and becomes aware of itself as information about the body, subjective states, past memories, and the personal future. Mead (1934; cf. James, 1890/1981) distinguished between two aspects of the self, the knower (the "I") and the known (the "me"). In our terms, these two aspects of the self reflect (a) the sum of one's conscious processes and (b) the information about oneself that enters awareness when one becomes the object of one's own attention. The self becomes organized around goals (see Locke, this volume; Snyder, Rand, & Sigmon, this volume).

Consciousness gives us a measure of control, freeing us from complete subservience to the dictates of genes and culture by representing them in awareness, thereby introducing the alternative of rejecting rather than enacting them. Consciousness thus serves as "a clutch between programmed instructions and adaptive behaviors" (Csikszentmihalyi & Csikszentmihalyi, 1988, p. 21). Alongside the genetic and cultural guides to action, it establishes a *teleonomy of the self*, a set of goals that have been freely chosen by the individual (cf. Brandstätter, 1998; Deci & Ryan, 1985). It might, of course, prove dangerous to disengage our behavior from direct control by the genetic and cultural instructions that have evolved over millennia of adapting to the environment. On the other hand, doing so may increase the chances for adaptive fit with the present environment, particularly under conditions of radical or rapid change.

Attentional processes shape a person's experience. The ability to regulate one's attention is

underappreciated. As we have noted elsewhere, "What to pay attention to, how intensely and for how long, are choices that will determine the content of consciousness, and therefore the experiential information available to the organism. Thus, William James was right in claiming, 'My experience is what I agree to attend to. Only those items which I notice shape my mind' " (Csikszentmihalyi, 1978, p. 339). The choices made are critical because attention is finite, limiting the amount of information that can be processed in consciousness (Csikszentmihalyi & Csikszentmihalyi, 1988). This information is the medium of exchange between person and environment, as well as the material out of which the self is formed.

Attention thus plays a key role in entering and staying in flow. *Entering flow* is largely a function of how attention has been focused in the past and how it is focused in the present by the activity's structural conditions. Interests developed in the past will direct attention to specific challenges. Clear proximal goals, immediate feedback, and just-manageable levels of challenge orient the organism, in a unified and coordinated way, so that attention becomes completely absorbed into the stimulus field defined by the activity.

The phenomenology of flow reflects attentional processes. Intense concentration, perhaps the defining quality of flow, is just another way of saying that attention is wholly invested in the present exchange. Action and awareness merge in the absence of spare attention that might allow objects beyond the immediate interaction to enter awareness. One such object is the self; the loss of self-consciousness in flow marks the fading of Mead's "me" from awareness, as attention is taken up entirely by the challenges being engaged. The passage of time, a basic parameter of experience, becomes distorted because attention is so fully focused elsewhere.

Staying in flow requires that attention be held by this limited stimulus field. Apathy, boredom, and anxiety, like flow, are largely functions of how attention is being structured at a given time. In boredom, and even more so in apathy, the low level of challenge relative to skills allows attention to drift. In anxiety, perceived challenges exceed capacities. Particularly in contexts of extrinsic motivation, attention shifts to the self and its shortcomings, creating a self-consciousness that impedes engagement of the challenges.

Flow, Complexity, and Development

When attention is completely absorbed in the challenges at hand, the individual achieves an ordered state of consciousness. Thoughts, feelings, wishes, and action are in concert. Subjective experience is both differentiated and integrated, the defining qualities of a complex phenomenon.

The notion of complexity applies in a second sense, as well. The flow state is intrinsically rewarding and leads the individual to seek to replicate flow experiences; this introduces a selective mechanism into psychological functioning that fosters growth. As people master challenges in an activity, they develop greater levels of skill, and the activity ceases to be as involving as before. In order to continue experiencing flow, they must identify and engage progressively more complex challenges. The teleonomy of the self is thus a growth principle; the optimal level of challenge stretches existing skills (cf. Vygotsky, 1978), resulting in a more complex set of capacities for action. This factor distinguishes the flow model from theories that define optimal challenge in terms of either a homeostatic equilibrium point to be returned to or a maximum level of challenge to be reached (Moneta & Csikszentmihalyi, 1996). A flow activity not only provides a set of challenges or opportunities for action but it typically also provides a system of graded challenges, able to accommodate a person's continued and deepening enjoyment as skills grow.

The teleonomy of the self is a source of new goals and interests, as well as new capacities for action in relation to existing interests (Csikszentmihalyi & Nakamura, 1999). That is, previously we observed that possessing skills and interest in an activity is one precondition for finding flow in it. Descending a staircase is an almost unnoticed means to an end for the person on foot, but it might be a beckoning opportunity for flow to the person on a skateboard. The phenomenon of emergent motivation means we can come to experience a new or previously unengaging activity as intrinsically motivating if we once find flow in it. The motivation to persist in or return to the activity arises out of the experience itself. The flow experience is thus a force for expansion in relation to the individual's goal and interest structure, as well as for growth of skills in relation to an existing interest.

The Autotelic Personality

As noted previously, flow theory and research have focused on phenomenology rather than personality. The goal has been to understand the dynamics of momentary experience and the conditions under which it is optimal. The capacity to experience flow appears to be nearly universal. Nevertheless, people vary widely in the frequency of reported flow. People also differ in the quality of their experience, and in their desire to be doing what they are doing, when their capacities and their opportunities for action are simultaneously high. This suggests that the latter balance represents an important but not a sufficient condition for flow.

From the beginning, Csikszentmihalyi (1975/2000) recognized the possibility of an *autotelic personality*, a person who tends to enjoy life or "generally does things for their own sake, rather than in order to achieve some later external goal" (Csikszentmihalyi, 1997, p. 117). This kind of personality is distinguished by several *metaskills* or competencies that enable the individual to enter flow and stay in it. These metaskills include a general curiosity and interest in life, persistence, and low self-centeredness, which result in the ability to be motivated by intrinsic rewards. Despite the importance of the topic, little theory or research was devoted to autotelic personality prior to 1990. Later in this chapter, we will discuss research in this area conducted during the past decade.

Measuring Flow and Autotelic Personality

Researchers have developed means of measuring intraindividual (e.g., cross-context) and interindividual differences in the frequency of flow. More recently, increased attention has been paid to measuring individual differences in autotelic personality, the disposition to experience flow. Next, we briefly summarize the measures used in flow research.

Measuring Flow

Psychology has devoted limited attention to developing methods for the systematic investigation of subjective experience. The phenomenon has been viewed as falling outside the sphere of

scientific inquiry throughout many of the years since the decline of introspectionist psychology. Attention to subjective experience has grown recently (Richardson, 1999), however, increasing interest in the methods used in flow research. Several self-report tools have been fashioned in order to study this inherently unstable, un-self-conscious, subjective phenomenon, including interviews, paper-and-pencil measures, and the Experience Sampling Method.

Interview

As described, the flow concept emerged out of qualitative interviews about the nature of the experience when a particular activity is going well (Csikszentmihalyi, 1975/2000). The semi-structured interview provides a holistic, emic account of the flow experience in real-life context. It was a critical tool in initially identifying and delineating dimensions and dynamics of the flow experience. It continues to be the approach of choice in studies directed toward rich, integrated description. For example, Jackson (1995) has asked elite athletes to describe a flow experience, distinguishing the characteristics of the state, factors that help and hinder entry into the state, factors that disrupt it, and degree of control over it. Perry (1999) has focused writers on the most recent occasion when they lost track of time while writing, asking them to describe what led up to the experience and how they deal with blocks that keep them out of flow.

Questionnaire

One-time paper-and-pencil measures have been used when the goal is not to identify but instead to measure dimensions of the flow experience and/or differences in its occurrence across contexts or individuals. The Flow Questionnaire presents respondents with several passages describing the flow state and asks (a) whether they have had the experience, (b) how often, and (c) in what activity contexts (Csikszentmihalyi & Csikszentmihalyi, 1988). The quotations used were drawn from the original interviews about flow activities (Csikszentmihalyi, 1975/2000), one each from a dancer, a rock climber, and a composer. Allison and Duncan (1988) presented a sample of working women with an additional composite description of "anti-flow" experience encompassing the aversive states of anxiety, boredom, and apathy.

The Flow Scale (Mayers, 1978) elicits an estimate of the frequency with which a person experiences each of ten dimensions of the flow experience (e.g., "I get involved," "I get direct clues as to how well I am doing"). The instrument has been used as a repeated measure to assess differences across activity contexts in the extent to which the flow dimensions are experienced. Delle Fave and Massimini (1988) utilized the Flow Questionnaire and Flow Scale in tandem to identify a person's flow activities and then compare the person's rating of the flow dimensions for primary flow activities with those for a standardized set of everyday activities (e.g., work, TV viewing). More recently, paper-and-pencil scales have been developed to measure the flow state in specific contexts, including sport (Jackson & Marsh, 1996) and psychotherapeutic practice (Parks, 1996).

The Experience Sampling Method

Interview and questionnaire approaches are limited by (a) their reliance on retrospective reconstruction of past experience and (b) the requirement that respondents first average across many discrete experiences to compose a picture of the typical subjective experience when things are going well, and then estimate the frequency and/or intensity of this experience. The study of flow has progressed in large part because researchers in the late 1970s developed a tool uniquely suited to the study of situated experience, including optimal experience. Full descriptions of the Experience Sampling Method (ESM) can be found elsewhere (e.g., Csikszentmihalyi & Larson, 1987). Subjects are equipped with paging devices (pagers, programmable watches, or handheld computers); these signal them, at preprogrammed times, to complete a questionnaire describing the moment at which they were paged. The method takes samples from the stream of actual everyday experience. Unlike diaries and time budgets, use of the ESM from the beginning focused on sampling not only activities but also cognitive, emotional, and motivational states, providing a tool for building a systematic phenomenology. Contents of the questionnaire vary depending on the research goals, as do paging schedules and study duration. A quasi-random schedule with data collected for one week has been widely used to provide a representative picture of daily life.

ESM studies of flow have focused on the sampled moments when (a) the *conditions for flow*

exist, based on the balance of challenges (or opportunities for action) and skills (abilities to deal with the situation) and/or (b) the *flow state* is reported. The latter usually is measured by summing the self-reported levels of concentration, involvement, and enjoyment, which are typically measured on 10-point scales. These three dimensions provide a good proxy for what is in reality a much more complex state of consciousness.

The first mapping of the phenomenological landscape in terms of perceived challenges and skills identified three regions of experience (Csikszentmihalyi, 1975/2000): a *flow* channel along which challenges and skills matched; a region of *boredom*, as opportunities for action relative to skills dropped off; and a region of *anxiety*, as challenges increasingly exceeded capacities for action. This mapping was based on the original accounts of deep flow (see Figure 7.1a).

Initial analyses of ESM data were not consistent with this mapping, however. Simply balancing challenges and skills did not optimize the quality of experience. As Massimini and his colleagues clarified, inherent in the flow concept is the notion of skill stretching. Activities providing minimal opportunities for action do not lead to flow, regardless of whether the actor experiences a balance between perceived challenge and skill. Much of TV viewing exemplifies the less than optimal experience when low skills match low challenges (Kubey & Csikszentmihalyi, 1990). Operationally, the Milan group re-

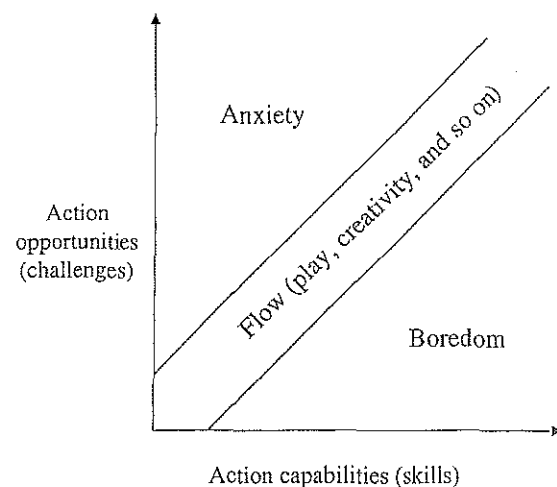


Figure 7.1a The original model of the flow state. Flow is experienced when perceived opportunities for action are in balance with the actor's perceived skills. Adapted from Csikszentmihalyi (1975/2000).

defined flow as the balance of challenges and skills *when both are above average levels for the individual*. That is, flow is expected to occur when individuals perceive greater opportunities for action than they encounter on average in their daily lives, and have skills adequate to engage them. This shift led to an important re-mapping of the phenomenological terrain, revealing a fourth state, apathy, associated with low challenges and correspondingly low skills. Experientially, it is a sphere of stagnation and attentional diffusion, the inverse of the flow state.

The Milan group subsequently showed that the resolution of this phenomenological map can be made finer by differentiating the challenge/skill terrain into eight experiential channels rather than four quadrants (see Figure 7.1b). The quality of experience intensifies within a channel or quadrant as challenges and skills move away from a person's average levels. Operationally, they divided the challenge/skill space into a series of concentric rings, associated with increasing intensity of experience. A researcher might decide to focus only on the outer rings of the flow channel, theoretically the region of the deep flow experiences described in the early interviews. Subsequent researchers have experimented with different challenge/skill formulas (e.g., Hektner & Csikszentmihalyi,

1996; Moneta & Csikszentmihalyi, 1996), retaining the essential insight that perceived challenges and skills must be relative to a person's own average levels.

Measuring the Autotelic Personality

As interest in the autotelic personality has grown, researchers have sought a way to measure it with the naturalistic data provided by the ESM. *Time spent in flow* has been the most widely used measure of the general propensity toward flow (Adlai-Gail, 1994; Hektner, 1996). However, time in flow also reflects the range of action opportunities that happen to be available in the individual's environment during the sampling period. Other researchers therefore have operationalized the disposition as *intrinsic motivation in high-challenge, high-skill situations*, reflected in low mean scores on the item "I wish to be doing something else" when subjective challenges and skills are both above average (Abuhamdeh, 2000; Csikszentmihalyi & LeFevre, 1989).

A more traditional paper-and-pencil measure was utilized by Csikszentmihalyi, Rathunde, and Whalen (1993). They defined autotelic personality as the conjunction of receptive and active qualities, one measured by the Jackson PRF factors of Sentience and Understanding and the other by Achievement and Endurance (Jackson, 1984). They theorized that jointly these qualities would account for autotelic individuals' openness to new challenges and readiness to engage and persist in high-challenge activities, key aspects of the metaskills that contribute to getting into flow and staying there (Csikszentmihalyi & Nakamura, 1989; Csikszentmihalyi et al., 1993; Inghilleri, 1999).

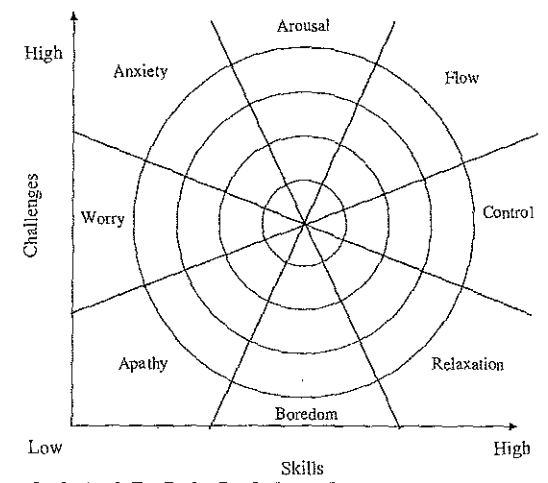


Figure 7.1b The current model of the flow state. Flow is experienced when perceived challenges and skills are above the actor's average levels; when they are below, apathy is experienced. Intensity of experience increases with distance from the actor's average levels of challenge and skill, as shown by the concentric rings. Adapted from Csikszentmihalyi (1997).

Recent Directions in Flow Research

The past decade has seen developments on several fronts in the understanding of flow. In large part this has been due to longitudinal ESM studies of adolescent and adult samples being conducted at the University of Chicago.

Consequences of Flow

According to the flow model, experiencing flow encourages a person to persist at and return to an activity because of the experiential rewards it promises, and thereby fosters the growth of

skills over time. In several studies, flow was associated with commitment and achievement during the high school years (Carli, Delle Fave, & Massimini, 1988; Mayers, 1978; Nakamura, 1988). More recently, a longitudinal ESM study of talented high school students provided evidence of a relationship between quality of experience and persistence in an activity. Students still committed to their talent area at age 17 were compared with peers who already had disengaged. Four years earlier, those currently still committed had experienced more flow and less anxiety than their peers when engaged in school-related activities; they also were more likely to have identified their talent area as a source of flow (Csikszentmihalyi et al., 1993). In a longitudinal study of students talented in mathematics (Heine, 1996), those who experienced flow in the first part of a course performed better in the second half, controlling for their initial abilities and grade point average. Because the self grows through flow experiences, we also might expect time spent in flow to predict self-esteem. Correlational studies with ESM data support this expectation (Adlai-Gail, 1994; Wells, 1988).

In addition to enhancing positive outcomes, longitudinal research suggests that mastering challenges in daily life may protect against negative outcomes (Schmidt, 2000). For American adolescents who had experienced high adversity at home and/or at school, the availability of challenging activities, involvement in these activities, and sense of success when engaged in them were all associated with diminished delinquency two years later.

Teenagers' quality of experience in everyday life, understood in terms of the subjective challenge/skill landscape, also may have consequences for physical health (Patton, 1999). In the same representative national sample of adolescents, time spent in relaxation (low-challenge, high-skill) situations was associated with greater freedom from physical pain 2 and 4 years later as well as concurrently. Apparent risk factors with respect to quality of experience differed by gender. The amount of physical pain reported 2 and 5 years later (and concurrently) was correlated with time spent in anxiety (high-challenge, low-skill) situations for girls, but with time spent in apathy (low-challenge, low-skill) situations for boys.

The Nature and Dynamics of Flow

The accumulating evidence for positive correlates and outcomes of the flow experience un-

doubtedly accounts for a portion of the interest paid to flow in recent years. However, this interest, in a sense, misses the point. From the perspective of the individual, the flow state is a self-justifying experience; it is, by definition, an end in itself. We continue to be reminded of this by studies of flow in particular activity contexts.

That is, a distinct strand of flow research can be traced forward through the 1980s and 1990s from the original study of flow activities. In this line of research, qualitative interviews have yielded domain-specific descriptions of deep flow in diverse activities: elite and nonelite sport (Jackson & Csikszentmihalyi, 1999; Kimiecik & Harris, 1996); literary writing (Perry, 1999) and artistic and scientific creativity more generally (Csikszentmihalyi, 1996); social activism (Colby & Damon, 1992); and aesthetic experience (Csikszentmihalyi & Robinson, 1990). As noted earlier, these studies confirm the basic contours of the flow state, demonstrating how universal they are across activity contexts. Research also is yielding a differentiated picture of the sources of flow within particular contexts. For example, Trevino and Trevino (1992), Webster and Martocchio (1993), and others have explored how flow can be facilitated in software design and computer-mediated communication. Shernoff, Knauth, and Makris (2000) examined levels of flow across academic and nonacademic classes and across different types of classroom activity, in an ESM study of adolescents using a national sample. Paralleling well-documented differences in quality of experience between active and passive leisure pursuits (e.g., sports vs. TV viewing), levels of flow were higher in "active" classwork (taking tests, participating in groups, working individually) than in "passive" classwork (listening to lectures, watching videos or television).

As new ESM studies are conducted, we continue to clarify the general features of the experiential landscape defined by the interaction of challenges and skills. Selected data from a recent large-scale ESM study of adolescents illustrate the current picture (see Figure 7.2). For each challenge/skill combination, Figure 7.2 shows the mean ratings for several key experiential variables: concentration, enjoyment, wish to be doing the activity, self-esteem, and perceived importance to the future. Schoolwork is prevalent in the high-challenge, low-skill (anxiety) quadrant; structured leisure, schoolwork, and work in the high-challenge, high-skill (flow) quadrant; socializing and eating in the low-challenge, high-skill (relaxation) quadrant;

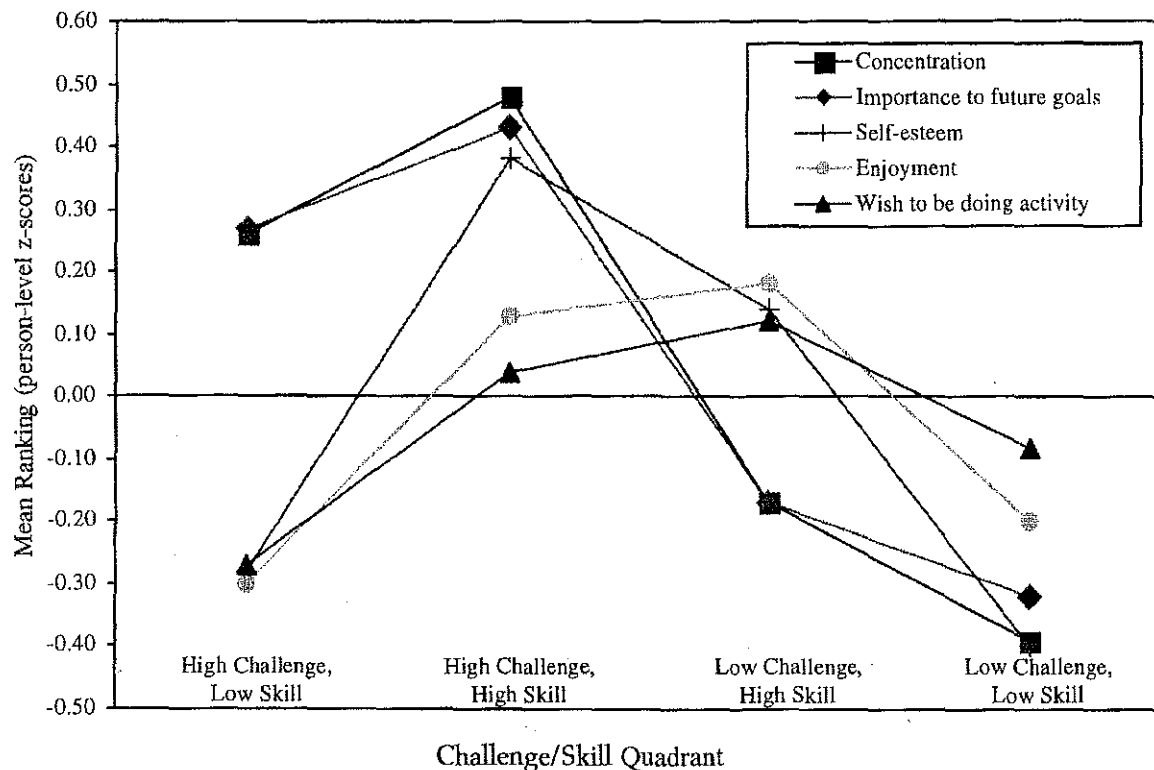


Figure 7.2 Quality of experience in each flow quadrant for a national sample of American adolescents ($n = 824$). Adapted from Hektner and Asakawa (2000).

and passive leisure and chores in the low-challenge, low-skill (apathy/boredom) quadrant.

The anxiety quadrant is characterized, as expected, by high stakes but low enjoyment and low motivation. Only in the flow quadrant are all of the selected variables simultaneously above the personal mean. In contrast, all are below average in the apathy/boredom quadrant. Concentration, self-esteem, and importance to future goals peak in the flow quadrant, whereas enjoyment and wish to be doing the activity are actually somewhat higher in the relaxation quadrant. The quality of experience in the relaxation quadrant is thus partially positive even though the stakes are not high and attention is unfocused. Marking a shift in the model, the current mapping of the experiential landscape labels the low-challenge, high-skill quadrant as *relaxation* to capture the mixed nature of the subjective state, which is less aversive than originally thought.

We speculate that two kinds of experiences might be intrinsically rewarding: one involving conservation of energy (relaxation), the other involving the use of skills to seize ever-greater opportunities (flow). It is consistent with current understandings of evolution to suppose that both of these strategies for coping with the environment, one conservative and the other

expansive, were selected over time as important components of the human behavioral repertoire, even though they motivate different—in some sense, opposite—behaviors. The two distinctly aversive situations, which organisms are presumably programmed to avoid, are those in which one feels overwhelmed by environmental demands (anxiety) or left with nothing to do (apathy).

Obstacles and Facilitators to Flow

Studies conducted in the late 1980s and 1990s, including longitudinal ESM studies, have enabled advances in knowledge about the conditions of flow. We look first at obstacles to optimal experience; we then turn to research on facilitators and causes of flow. We focus on two impediments to flow that concern the subjective construction of experience.

Preference for Relaxation Versus Flow

As noted previously, the quality of experience appears to be more positive than originally expected in the low-challenge, high-skill space adjacent to the flow channel or quadrant. One possible cause is that, at least for American adolescents, it is not uncommon in the context

of schoolwork to feel overchallenged when stakes are high. The situation induces self-consciousness (cf. ego orientation), challenge becomes a stress rather than an opportunity for action, and reducing the level of challenge becomes an attractive option. This interpretation appeared to be borne out in comparisons of normal American adolescents, Italian adolescents at an elite school, and talented high school students in the United States. For the sample of normal American adolescents, motivation (Csikszentmihalyi & Nakamura, 1989) and happiness (Csikszentmihalyi & Rathunde, 1993) were greater in low-challenge, high-skill situations than when challenges and skills were simultaneously high.

Attitudes Toward Work and Play

The work-play distinction as it relates to subjective experience has been an important thread running through flow research. The original flow study showed that work, as well as play, can occasion deep flow (Csikszentmihalyi, 1975/2000; see also Delle Fave & Massimini, 1988). Haworth's (1997) ESM research on unemployed youth in the United Kingdom underlined this similarity between work and play. Whereas unemployment provides few opportunities for flow because the perceived challenges are low in everyday life, both work and play can provide a structured source of challenges in one's life.

Beginning with LeFevre (1988), however, research revealed a paradox about work that perhaps could be detected only with ESM data. In a heterogeneous sample of adult workers, multiple dimensions of subjective experience (e.g., concentrating, feeling happy, strong, creative, and satisfied) were significantly more positive in high-challenge, high-skill situations than elsewhere, and this was true both at work and at leisure. Furthermore, significantly more time was spent in high-challenge, high-skill situations at work than at leisure, whereas the opposite was true of time spent in low-challenge, low-skill situations. Work life was dominated by efficacy experiences and leisure time by moments of apathy. *Despite this experiential pattern*, workers wished to be doing something else when they were working and wished to be doing just what they were doing when at leisure (LeFevre, 1988). Motivation seemed insensitive to the actual data of the workers' own experience, being driven instead by their cultural prejudices about work (viewed as what one has to

do) versus leisure (viewed as what one freely chooses).

An ESM study of students in grades 6 through 12 revealed that these attitudes toward work and play are already in place by sixth grade and intensify across the adolescent years (Csikszentmihalyi, 1997). Motivation in experiences characterized as "work" (academic classes and, later, paid jobs) was lower than in experiences characterized as "play" (e.g., passive activities like TV viewing), even though the worklike experiences were associated with higher concentration, importance to the future, and self-esteem. On a positive note, 10% of the time sampled, students reported engaging in extracurricular activities and pursuing art, games, and hobbies outside of formal settings. They labeled these activities as simultaneously worklike and playlike and experienced them as both important and enjoyable. In addition, both "play" and "work" were more positive than experiences that were labeled neither worklike nor playlike (e.g., maintenance activities like chores).

We turn next to facilitators of flow. Our interest here is in extrasituational factors; we focus on autotelic personality and autotelic families.

Autotelic Personality

Individuals vary in the time spent in flow. Over one third of those surveyed in U.S. and German polls (responding to slightly different questions) estimated that they rarely or never experienced involvement so intense that they lose track of time (42% of Americans, 35% of Germans), whereas about one fifth (16% of Americans, 23% of Germans) reported having such experiences daily (Gallup Poll, 1998; Noelle-Neumann, 1995). Adopting a different metric, LeFevre (1988) found that a sample of adult workers included about 40% who were most motivated in high-challenge, high-skill situations and about 40% who were most motivated in low-challenge, low-skill situations; the former might be called *autotelic individuals*. Measuring autotelic personality similarly with young adults, Hektner (1996) confirmed that autotelics were least happy and motivated in apathy (low-challenge, low-skill) situations, whereas nonautotelics (those least motivated in high-challenge, high-skill situations) did not find the apathy condition aversive. Individual differences thus clearly exist. What correlates and consequences do they have?

Studying a national sample of American teenagers, Adlai-Gail (1994) showed that autotelic personality, measured by time in flow, has positive correlates. Autotelic students had more well-defined future goals and reported more positive cognitive and affective states. For a sample of American adults, Abuhamdeh (2000) compared autotelics and nonautotelics, defined by preference for high-action-opportunity, high-skill situations. His research begins to suggest how high-action-opportunity, high-skill situations are distinctively experienced by autotelics, showing that autotelics experience less stress and strain in the flow quadrant than outside of it, whereas the reverse is true for nonautotelics.

Autotelic Families

The question thus becomes how autotelic personality is shaped. Rathunde (1988, 1996) demonstrated with data from an ESM study of talented adolescents that autotelic personality is fostered in what he has called a "complex" family environment, one that simultaneously provides support and challenge. Students from complex families spent significantly more time in high-challenge, high-skill situations and less time in low-challenge, low-skill situations than did the students from other types of families (e.g., ones that provided support or challenge alone). They also felt more in control of their actions and better about themselves generally, and they reported more positive experience in productive activities (e.g., studying).

We might speculate that early schooling experiences are another critical contributor to the development of autotelic personality. The Key School described in the next section represents one educational program deliberately designed to foster skills and propensity for flow, as well as identification of interests.

Interventions and Programs to Foster Flow

Flow researchers have discussed how their findings might be applied by practitioners and people in general (e.g., Csikszentmihalyi, 1990, 1996; Csikszentmihalyi & Robinson, 1990; Jackson & Csikszentmihalyi, 1999; Perry, 1999). The relevance of the flow concept is increasingly noted in applied settings, such as the Montessori schools (Kahn, 2000) and the field of oc-

cupational therapy (Emerson, 1998; Rebeiro & Polgar, 1998).

Flow principles have been translated into practice in a variety of contexts. Two types of intervention can be distinguished: (a) those seeking to shape activity structures and environments so that they foster flow or obstruct it less and (b) those attempting to assist individuals in finding flow. The former include interventions to make work a greater source of flow, such as efforts by the Swedish police to identify obstacles to flow in the organization of police work and then to restructure it along lines more conducive to flow on the beat. Likewise, factory work has been evaluated and reorganized to enhance flow at a Volvo automotive plant. Several art museums, including the Getty Museum in Los Angeles, have incorporated flow principles during their design of exhibits and buildings. Flow principles have informed product design at Nissan USA, with the goal of making the use of the product more enjoyable.

Educational settings present an opportunity to apply the results of flow research most directly. One experiment deserving mention is the 13-year-old Key School in Indianapolis, where the goal is to foster flow by influencing both environment and individual (Whalen, 1999). This public elementary and middle school seeks to (a) create a learning environment that fosters flow experiences and (b) help students form interests and develop the capacity and propensity to experience flow. In the Flow Activities Center, students have regular opportunities to actively choose and engage in activities related to their own interests and then pursue these activities without imposed demands or pacing. The teacher supports children's selection and enjoyment of activities that challenge and stretch them and helps the students to identify new challenges as their capacities grow. Based on observations of the Flow Activities Center and conversations with teachers, Whalen concluded that the center is effectively fostering "serious play" (Csikszentmihalyi et al., 1993) and that it has introduced values of flow and intrinsic motivation into the life of the school more generally.

The most direct efforts to assist individuals in finding flow lie in the sphere of psychotherapy. The Milan group built on its extensive program of basic research to develop therapeutic interventions aimed at transforming the structure of daily life toward more positive experience. Psychiatric interventions informed by flow theory

have been successful in diverse cultural settings, including Nicaragua and northern Somalia (Inghilleri, 1999). In Italy, the ESM, guided by flow theory, has provided a tool for identifying patterns in everyday experience and ways in which these might be transformed (Inghilleri, 1999; Massimini, Csikszentmihalyi, & Carli, 1987). Additionally, it provides a means for monitoring one's success in transforming these patterns—a form of feedback about the extent of change. ESM data reveal to patient and therapist the disjunctions between attitudes and actual experience (as in the paradox of work described earlier, wherein work is disliked despite being absorbing), and between professed and enacted preferences (i.e., strength of professed commitment vs. actual time allocation). Likewise, by identifying activities that are intrinsically motivating, it pinpoints areas where optimal experience can be increased.

Delle Fave and Massimini (1992) reported a case study involving the 1-year psychotherapy of a young woman struggling with agoraphobia. She feared being alone in public and experienced anxiety symptoms in crowds. Despite drug therapy, the woman's life structure had become narrowly circumscribed around work, accompanied travel, and home, containing her agoraphobia but at the expense of enjoyment and growth. At the outset, the Flow Questionnaire was administered in order to identify activities that had ever been sources of flow in the woman's daily life. Therapy focused on supporting redirection of her time and attention into these activities. During the year, nine weeklong ESM samples were collected. The ESM data constituted an integral part of treatment: Experiential patterns (time use and associated quality of experience) were discussed with the client, along with strategies for transforming her life structure. The young woman's symptoms disappeared over the course of treatment, as registered in the reallocation of time away from TV viewing (i.e., homebound passive leisure) and toward activities in public places (e.g., volunteer work and socializing). Time spent alone also increased because of reduced need for accompanied travel. Improvement in quality of experience was marked, with decreased time in the low-challenge, low-skill conditions conducive to apathy and increased time in the high-challenge, high-skill conditions conducive to flow. Drug treatment was discontinued after 10 months.

Many therapies focus on conflict, under the

assumption that once this is worked through, happiness will take care of itself. The therapeutic approach described here reverses figure and ground. Use of flow principles allows therapy to be reoriented toward building on interests and strengths, taking advantage of the growth of skill and confidence (cf. Wells, 1988) that attends flow experience, and enabling the individual to reduce dysphoric experience as a by-product of this growth.

The ESM also may provide the nonclinical population with a tool for personalized intervention directed toward prevention by optimizing (vs. rehabilitating) patterns of everyday experience (cf. Snyder, Feldman, Taylor, Schroeder, & Adams, 2000). The case example just described raises the possibility of structuring the evaluation and transformation of one's daily life more like a flow activity, making the change process itself more enjoyable by endowing it with clear goals, clear and rapid feedback, and manageable challenges. As a tool for insight, there should be many important applications of individual ESM use informed by flow principles.

A common theme of the educational and the therapeutic application of flow principles bears underlining. Their goal is not to foster the state of flow directly but rather to help individuals identify activities that they enjoy and learn how to invest their attention in these activities.

Directions for Future Research

The interventions just described represent promising directions for future applied efforts. In this section, we touch upon directions for future research.

Autotelic Personality: Attentional Processes and Meaningful Goals

Much remains to be learned about the nature of the autotelic personality and what qualities, metaskills, and dispositions characterize individuals inclined and able to find flow in daily life. Beyond Rathunde's (1988) work on the family environment, research is needed on the critical contributors and obstacles to the development of autotelic personality.

For both basic knowledge and intervention, fundamental and urgent questions concern the nature of the attentional processes that foster flow and the way in which optimal attentional

practices are formed (Hamilton, 1983). Being able to control one's attention is what makes unified action and experience possible. The capacity to direct and regulate one's own attention is always critical; whatever occupies attention shapes experience and, through it, consciousness, the self, and the culture. Under contemporary social conditions, the importance of the self-regulation of attention is amplified. Individuals encounter exponentially growing amounts of information from an ever-rising number of sources, and they must decide how to invest their attention among these many possible claimants. Because attention is recognized as a precious commodity, others compete aggressively to attract, control, and direct it.

Elsewhere, we have reflected on the amorality of flow, acknowledging that it is possible for people to seek flow in activities that are neutral or destructive to the self and/or the culture (e.g., Csikszentmihalyi & Larson, 1978; Csikszentmihalyi & Rathunde, 1993). As the flow concept is taken up in applied settings, it becomes increasingly clear that flow experiences also can be used to beguile others' attention. Creating settings and objects that foster flow becomes a means of controlling scarce attentional resources. For each individual, the best defense against the manipulation of one's limited attention by others is to determine for oneself how one wants to invest it and then attempt to do so efficiently and wisely.

A related issue is the question of how children and adolescents learn what goals deserve attention. Individual differences in preference for flow, as well as ruptures within the unity of absorption and motivation (the "paradox of work"), emerge by early adolescence. We need to extend flow research downward into childhood in order to identify the endowments and experiences that differentiate those who reach adolescence with a propensity for flow from peers who prefer states of control, relaxation, and even apathy to the risk and rigors of challenging activities. Autotelic persons are attracted to goals that require effort to achieve; those who prefer relaxation are not. How does such a difference become habitual? The data suggest that the two strategies may be equally positive in the short term but that children who learn to enjoy investing effort in meaningful goals can count on more positive outcomes in the long run, compared with children who learn to enjoy less demanding goals. Longitudinal research would be especially helpful here, as

would observational studies in flow-promoting early settings.

Measurement of Flow

ESM researchers have developed multiple ways of operationalizing the flow experience or defining when an individual is "in flow." As described, these include various state measures (usually composite variables, including cognitive, affective, and motivational components) and situational measures (indices of relative challenge and skill). We may be nearing the point when it will be advantageous to assess the pros and cons of different operationalizations and move toward a consensual ESM measure to facilitate the accumulation of knowledge.

A larger issue is the division of labor that has grown up within flow research between (a) ESM studies of daily experience, in which deep flow is represented only occasionally, and (b) interview studies of deep flow, in which the dynamics of experience are accessible only through retrospection. The reasons for the division of labor are clear—interrupting deep flow, as the ESM would do, destroys the phenomenon—but we should recognize the attendant limitations on what we can learn and generalize from ESM data. We may want to explore existing and conceivable alternatives. Some ESM research in fact has been undertaken with strategically selected samples engaged in flow activities, such as in the mountaineers studied by Delle Fave (personal communication, 2000) and colleagues during a Himalayan expedition. A hands-free version of the ESM might be helpful. Secondary analysis of existing ESM data sets, isolating all instances of opportunistically sampled deep flow, is also possible. Beyond this, alternative methods merit consideration, such as analysis of videotaped sequences of individuals in flow. This might encompass tracking a set of observable markers of flow, collecting self-reports about the associated course of subjective experience, and/or combining the two data sources. For example, working within the flow paradigm, Rathunde (1997) asked families to comment on audio playback of conversations immediately after they ended.

Forms of Flow

Research has focused most intensively on the individual's experience of flow in sports, games, and other kinds of structured leisure; in edu-

cational pursuits; and in artistic and other types of work. Other important areas remain relatively unexplored, and their investigation might contribute to further development of the flow model. For example, no research has addressed the category of *microflow activities* (Csikszentmihalyi, 1975/2000): activities like doodling that are short in duration, interstitial and subordinated within the stream of action, and often so routinized as to occur almost outside awareness. The early flow research suggested that they might play an important role in optimizing attentional regulation, and we suspect that further research into their dynamics and function would prove fruitful.

Relatively little research has addressed the experience of flow when attention is trained on internal sources of information (e.g., in psychotherapy, life-planning, life-review, and other forms of existential reflection; fantasy; spiritual experience). For many people, the inner life is vulnerable to chaos. ESM research shows that solitude is strenuous; the train of thought breaks down or becomes ruminative. Intrapsychic activities may foster development of a capacity for attentional self-regulation, however; research in this area is therefore important. These activities span a continuum from culturally defined domains (e.g., prayer), which may be understandable in terms of existing flow theory, to spheres that are largely unstructured by culturally provided rules and tools (e.g., life review), where research might extend the bounds of existing theory.

At the other end of the spectrum, flow has been studied in some group activities (e.g., team sports and classroom learning), but typically treating the individual as the focus of analysis. Other participants are conceptualized as sources of challenge (e.g., competitors) or of feedback about performance. Fewer studies have identified forms of what might be called *shared flow* (e.g., Csikszentmihalyi & Csikszentmihalyi, 1988; Csikszentmihalyi & Larson, 1984). This latter notion characterizes the inspired jam session (Csikszentmihalyi & Rich, 1998) or animated conversation; the *communitas* (Turner, 1974) experienced in expressive ritual; and the intense excitement of "hot groups" (Lipman-Blumen, 1999). Shared flow appears to be distinguishable from optimal individual experience in group settings where one's coparticipants may or may not be in flow. We lack an analysis of the phenomenon that addresses the possibility of emergent qualities, whether with respect

to dimensions, dynamics, conditions, or functions and effects.

Conclusions

Research on flow contributes knowledge to several topics that are of central importance to positive psychology. In the first place, it illuminates the phenomenology of optimal experience, answering the question, What is it like to live fully, to be completely involved in the moment? Second, this perspective leads to questions about the long-term consequences of optimal experience: Does the sum of flow over time add up to a good and happy life? Or only under certain conditions, that is, if the person develops an autotelic personality and learns to enjoy high challenges? Furthermore, this line of research tries to unravel the conditions that act as obstacles or facilitators to optimal experience, focusing especially on the most prominent institutions such as the family, schools, and the workplace. Although it seems clear that flow serves as a buffer against adversity and prevents pathology, its major contribution to the quality of life consists in endowing momentary experience with value.

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