Flow can be defined as the experience of being fully engaged with the task at hand, unburdened by outside concerns or worries. Flow is an enjoyable state of effortless attention, complete absorption, and focused energy. The pivotal role of flow in fostering good performance and high productivity has led psychologists to study the features and outcomes of this experience in the workplace, in order to ascertain the impact of flow on individual and organizational well-being, and to identify strategies to increase the workers’ opportunities for flow in job tasks.

This ground-breaking new collection is the first book to provide a comprehensive understanding of flow in the workplace that includes a contribution from the founding father of flow research, Mihaly Csikszentmihalyi. On a conceptual level, this book clarifies the features and structure of flow experience, and provides research-based evidence of how flow can be measured in the workplace on an empirical level, as well as exploring how it impacts on motivation, productivity, and well-being. By virtue of its rigorous but also practical approach, the book represents a useful tool for both scientists and practitioners. The collection addresses a number of key issues, including:

- Core components of how the idea of flow differs from experience in the work context
- Organizational and task-related conditions fostering flow at work
- How flow can be measured in the workplace
- The organizational and personal implications of flow
- The relationship between task features and flow opportunities at work

Featuring contributions from some of the most active researchers in the field, Flow at Work: Measurement and Implications is an important book in an emerging field of study. The concept of flow has enormous implications for organizations as well as the individual, and this volume will be of interest to all students and researchers in organizational/occupational psychology and positive psychology, as well as practitioners and consultants with an interest in employee motivation and well-being.

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Current Issues in Work and Organizational Psychology

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The chapters in this book are examples of academic debates regarding flow and research that attempts to address some of these issues. There are many questions that still need to be addressed if flow is to find its way into the pantheon of variables that are at the center of the work experience. Nonetheless, we feel that this book constitutes a good start.

In Chapter 1, Clive Fullagar, Antonella Delle Fave, and Steve Van Krevelen outline the history, definition, and development of the construct of flow. We place the conceptualization of flow into the psychological context of the time, pointing out how flow shifted the focus of academic scrutiny away from trying to understand why we engage in activities toward an analysis of the actual experience of absorption. The chapter describes how academic research has applied the construct of flow to an understanding of intense and positive involvement in work. The chapter outlines congruent theoretical frameworks that broaden our understanding of flow in the workplace and identifies organizational and individual predictors and outcomes of the experience. We proceed to outline some questions that remain and need to be addressed if flow is to establish itself as a central construct in the literature on the psychology of work.

Chapter 2, by Anja Schiepe-Tiska and Stefan Engeser, addresses the issue of measuring flow. These authors start by discussing the many-faceted complexity of flow that raises the issue of whether flow should be measured as a multi- or unidimensional construct. Furthermore, there seems to be some confusion in distinguishing between the preconditions, components, and outcomes of the flow experience. The chapter considers the strengths and weaknesses of a variety of methodologies that have been used to assess flow, including declarative (interviews, surveys, and experience sampling methods) and nondeclarative (neural and psychophysiological) measures. The authors point out how these methodologies have produced evidence that both supports and refutes theoretical conceptualizations of flow. Specific examples
are provided of scales that have been used by researchers studying flow. The chapter concludes with advice to researchers concerning which measurement approach is most appropriate according to the research question being addressed.

In Chapter 3 Despoina Xanthopoulou addresses some of the challenges confronting researchers wishing to capture the dynamic nature of flow at work. Although flow has trait-like components, it is predominantly a state-like construct. The chapter summarizes the empirical evidence that has indicated significant within-person fluctuations in the experience of flow. This is contradictory to much research that has studied optimal experience as a “trait-like” construct and analyzed flow from a cross-sectional, between-individual perspective. Studying both the within- and between-individual variance in flow has several important theoretical implications. First, such research captures the entirety and complexity of the flow experience at work. Second, it shifts the focus to understanding the proximal and situational triggers of flow. The chapter concludes by outlining the advantages and disadvantages of research methodologies that enable both the trait and state components of flow to be captured in the workplace.

Evangelia Demerouti and Anne Mäkikangas (Chapter 4) elaborate on the nature of the flow experience specifically as it relates to the work context. These authors distinguish between the operationalizations of work flow and work engagement. These authors expound on four theoretical frameworks that have been used to understand the phenomenon of flow at work: (1) the job characteristics model (Hackman & Oldham, 1980); (2) the job demands-resources model (Demerouti, Bakker, Nachreiner & Schaufeli, 2001); (3) the broaden-and-build theory of positive emotions (Fredrickson, 1998); and (4) affective events theory (Weiss & Cropanzano, 1996). These theories are used to develop propositions regarding the relationships between work and flow. Finally, Demerouti and Mäkikangas identify some personal, work-, and task-related predictors of optimal experience at work and the implications these have for both researching flow and crafting the workplace to facilitate the flow experience.

Lucia Ceja and Jose Navarro (Chapter 5) emphasize a changing picture in how we define and study flow at work. They describe work-related flow as a dynamic experience that changes over time and from task to task. Using a nonlinear dynamical systems (NDS) approach, the authors argue that cross-sectional, static studies of flow fail to capture its ever changing and fragile nature. Flow needs to be investigated intrapersonally and longitudinally because of its lack of stasis and homogeneity. Based on chaos theory, a NDS model enables us to study the complex, fluctuating, and nonlinear properties of flow at work. Defining flow as a dynamic experience has practical as well as theoretical implications. Specifically the prediction and measurement of flow become more difficult. The chapter outlines research strategies that can be used to study the intrapersonal dynamics of flow over time and provide an alternative knowledge of the flow process other than that generated by traditional linear models. The authors conclude the chapter with a description of how a more dynamic understanding of flow at work enables the workplace to be crafted to increase flow. The organizational and individual implications of this are discussed.
The consequences of flow at the individual and organizational levels are discussed by Susana Llorens and Marisa Salanova in Chapter 6. The authors provide an overview of the empirical literature on the topic of flow outcomes and consequences at work. The studies described in the chapter converge in showing that in the work domain flow promotes positive mood, active coping, task engagement, job satisfaction, creativity, and energy at the individual level. At the organizational level, flow supports a positive organizational climate, spontaneity, in- and extra-role performance, and service quality, as well as team effectiveness and performance. These outcomes are triggered by a process of positive cycles, or spirals, so that the positive experience of flow enhances the onset of more positive personal and environmental resources at work. From this perspective, the phenomenon of emotional contagion is also discussed in relation to the transmission of flow experience at work among team workers, both vertically or hierarchically, and horizontally among colleagues sharing the same task and responsibility. Future research advancements are outlined, and the potential of promoting flow at work is discussed in the twofold perspective of improving individual workers’ quality of life and organizations’ performance and service.

In Chapter 7 Giovanni Moneta explores the strategies that may be adopted by organizations to foster employees’ flow at work. Taking into account the empirical evidence of the match between perceived challenges and skills as the core antecedent of flow, Moneta highlights four basic strategies to support the onset and maintenance of flow at work in the long run: the first one is the step-by-step increase of challenges, allowing for a smooth and gradual enhancement of the person’s skills; the second one is the promotion of teamwork, exploiting the contagious properties of flow that have been identified in several studies. The third strategy is the selection of “flow-ers” (people specifically showing flow proneness on the basis of personality features); the fourth one is the promotion of flow metacognition – that is, the individuals’ awareness of the specific conditions and prerequisites that allow them to enter flow. The success of the strategy is closely related to the constraints of the organizational context in which the intervention to promote workers’ flow is conducted. The chapter ends with some reflections concerning the necessity to avoid excessive flow at work, based on empirical evidence showing that it can lead to lower job performance, as well as psychophysical health problems. Future research directions are proposed, such as the importance of studying other positive nonflow states, such as mindfulness, that do not require the tunneling of attention typical of flow but were nonetheless found to foster employees’ well-being and performance.

In Chapter 8 Patrick Knight and Christopher Waples focus their contribution on the convergences between flow theory and the concepts and constructs elaborated within the domain of work motivation. After pointing to the relative lack of attention to flow within the domain of organizational psychology research, the authors delve into the connections between motivational dimensions of flow – such as perceived goals and intrinsic rewards – and the motivation theories prominently taken as reference points in organizational psychology. Moving from the empirical evidence showing that in order for flow to arise individuals must be engaged in
a task performed in view of clear goals, the chapter discusses some of the constructs that may be fruitfully matched with flow theory in order to attain a description of motivation at work that encompasses the positive role of flow. To this purpose, the chapter offers a thorough examination of the relationship between flow theory and four constructs derived from work psychology: goal setting; goal framing; expectancy theory; and self-efficacy beliefs. At the same time, as highlighted in other chapters, the authors emphasize the need to take into account the intrinsic job characteristics, and the worker's flexibility in adjusting to the changing work environment and conditions. In the final section, researchers are invited to more deeply explore work-related flow, as a potentially fruitful area of investigation that could shed light on the motivational processes of workers, and provide suggestions about motivational strategies to promote performance.

Chapter 9, by Antonella Delle Fave and Marta Bassi, addresses two topics that have been substantially neglected within flow research and work psychology. The first one is the work experience of people engaged in traditional preindustrial jobs. The second topic is the interplay between the work experience and the long-term developmental trajectory of the individual, exemplified through data collected among immigrants who moved to Europe from non-Western countries. The chapter emphasizes the cultural bias affecting psychological studies, which prominently involve workers living in industrial and urban contexts, and generalize the findings to the whole working population. Based on data collected across countries and occupations, the authors highlight some peculiarities of the work experience reported by people living in rural areas or engaged in small-scale craft production. For example, the paradox of flow at work (low intrinsic motivation in spite of engagement) detected in modern jobs does not emerge in traditional occupations, such as handicrafts and farming, that support higher levels of autonomy and creativity. International findings also highlight the meaning and relevance of work to the person's long-term goals and social identity. This important component of work can counterbalance the limited potential for flow characterizing some job typologies, promoting the social identity of workers, especially migrant ones. These issues are discussed in light of the current challenges faced by work economy at the international level.

In the final chapter (Chapter 10) Sam Spurlin and Mihaly Csikszentmihalyi provide a concise conceptual overview of the history, current challenges, and future directions of flow at work. They describe the material and experiential dichotomy between work and leisure as the by-product of the industrial transition, leading to workers' alienation, through the disconnection of individual actions from the final outcome. The social problems generated by this process, including reduced performance and productivity, promoted stakeholders’ awareness of the needs and ideal role of the individual worker, leading to the large amount of studies focused on job motivations and the development of models aimed at identifying the ideal fit between job characteristics and human features. Increasing emphasis has been put on the promotion of individual autonomy at work, and the studies on flow confirmed the pivotal role of this dimension in fostering workers’ well-being. Other dimensions related to flow, such as challenge/skill balance, setting clear goals, and
getting clear feedback about task progress, represent core aspects that should be considered in any intervention aimed at fostering the perception of work as a positive force and resource in daily life. At the methodological level, the recent advances in wearable technology allow for the self-monitoring of the experiential and physiological dimensions in real time, thus providing invaluable information that can be fruitfully used for crafting work to be more meaningful and fulfilling.
What motivates us to work? This is a question that has engaged humankind since the earliest philosophers. Despite the interest in this fundamental question, there have been almost as many answers as there have been thinkers who have considered the issue. Even consensus on a definition of work motivation has been elusive, probably because the concept is so complex. Flow experience (Csikszentmihalyi, 1975), one of the most original constructs developed in psychology during the previous century, can partially help us answer such a challenging question. Its positive and rewarding features, which include deep concentration, involvement, and enjoyable absorption in an activity, may shed light on at least one of the driving forces leading people to invest massive amounts of energies and resources in the work domain – namely, intrinsic motivation.

The primary aim of this book is to gather the contributions of different researchers who have been trying to delve into the complex issue of flow experience at work, its antecedents and its outcomes. In order to fully grasp the contribution of flow theory to organizational psychology, we will start with the analysis of its distinctive motivational component, through a brief historical overview of the development of the concept of intrinsic motivation.

**Intrinsic and extrinsic motivation**

That individuals might engage in an activity because the activity is perceived as rewarding, in and of itself, is a notion that has not always been prevalent in the motivational literature (Deci, 1975). Early understandings of motivation were dominated by mechanistic theories, such as psychoanalysis and behaviorism (Pinder, 1984). Freud (1915/1927) believed that humans are driven to engage in behaviors by basic instincts and the interaction of these instincts with environmental constraints. Behavioral approaches emphasized the environmental contingencies that establish
mechanistic associations between stimuli, responses, and reinforcements (Skinner, 1953, 1971). Essentially behavior can be explained by the organism’s motivation to seek out appetitive and pleasant outcomes and to avoid punishing and unpleasant consequences. As Hunt (1965) pointed out, it was believed that “without the action of such extrinsic drive-stimuli, organisms [would] presumably become quiescent (Freud, 1915; Hull, 1943, p. 194).” The behaviorist emphasis on studying observable phenomena, in the interest of developing a scientific psychology, largely excluded internal processes as an explanation of what makes individuals engage in certain behaviors (Watson, 1913).

Woodworth (1918, 1958), in his behavior-primacy theory, was the first psychologist to postulate that behavior can be self-perpetuating. He proposed that humans are active organisms that can engage in intrinsically motivated behavior and that an activity can provide its own drive (Woodworth, 1918). Although Woodworth did not specifically study or describe an intrinsic motivational process, he planted the seed for later theories, such as Allport’s (1937) notion of “functional autonomy.” It was Allport who first stipulated that the drive to engage in an activity may become independent from the motive that initiated the activity such that the activity becomes self-motivating.

Despite Woodworth’s and Allport’s seminal theories of motivation, behavioral and mechanistic frameworks dominated the field until the mid-1950s. It was at this time that several studies conducted on animals began to recognize the intrinsic components of motivation. Specifically, this research demonstrated that animals would engage in certain behaviors purely out of curiosity or playful exploration, and in the absence of any extrinsic reward or reinforcement (Berlyne, 1955; Butler, 1953; Butler & Harlow, 1957; Montgomery, 1954; Myers & Miller, 1954; Welker, 1956). These experiments indicated “an independent exploratory motive” (White, 1959, p. 298). Over the course of the decade evidence began to accumulate that certain kinds of behaviors were not motivated by extrinsic factors. Many animal behaviors seemed to be driven by inquisitiveness and a need to explore and to effectively interact with the environment (White, 1959). Furthermore, such inquisitive behavior was more likely to occur in the absence of painful stimulation, homeostatic needs, and appetitive drives (Hunt, 1965).

At about the same time humanistic psychologists, such as Maslow (1954), Rogers (1961), and Laing (1967), were beginning to question some of the basic tenets of psychoanalysis and behaviorism. This “third force” in psychology had its roots in existential philosophical thought (e.g., Sartre, 1957). In contrast to the determinism of the other two psychological approaches, humanistic psychology posited that individuals were capable of “free will,” and defined themselves through the choices they made. The humanistic psychological perspective was essentially a subjective one, attempting to understand behavior through the phenomenological lens of the individual. Although many of the principles of humanistic psychology were untested at the time, its theoretical framework provided the impetus for the development of the notion of intrinsic motivation. For example, Maslow (1954) distinguished between the basic motivational drives (“deficiency needs”) for sex,
Flow at work

food, and safety, and the higher-order drives ("growth needs") to actualize talents, achieve understanding, and fulfill creative potential. Again, the distinction was made between extrinsic and intrinsic forms of motivation.

It was within this psychological Zeitgeist that the first theories specific to intrinsic motivation began to evolve. Many of these theories drew on White’s (1959) concept of the need to effectively and competently interact with one’s environment. The need for competence and self-determination was the basis for these emergent theories. De Charms (1968), for example, believed that the main motivating force for individuals was the need to be in control of one’s fate and to be personally effective in changing one’s environment. Deci (1975) conducted research indicating that people were motivated to engage in many behaviors out of a need for (a) competence (i.e., to control one’s environment and experience mastery); (b) relatedness (i.e., to interact and connect with others); and (c) autonomy (i.e., to be self-determining and the causal agent of one’s life).

Despite the emergence of these theories of intrinsic motivation, extrinsic motivation was still receiving attention, and researchers attempted to understand and articulate the relationship between these two types of motivations (Deci, 1975). Behaviorists would argue that extrinsic rewards enhance intrinsic motivation by providing secondary reinforcement and increasing resistance to extinction (Aronfreed, 1968; Keller, 1969). Early animal studies (Davis, Settlage, & Harlow, 1950) partially supported this association by showing that monkeys’ intrinsic interest in solving a puzzle was initially disrupted by the introduction of extrinsic rewards, but then increased at a higher level than prior to the presentation of food. However, de Charms (1968) proposed an alternative explanation to this phenomenon, hypothesizing that extrinsic rewards would decrease intrinsic motivation because they shift the locus of causality away from the individual to the reward. A series of experiments conducted in the 1970s demonstrated that if individuals were offered monetary rewards for performing an intrinsically motivated activity, intrinsic motivation would decrease, particularly if the rewards were made contingent on performance (Deci, 1971; Greene, Sternberg, & Lepper, 1976; Lepper, Greene, & Nisbett, 1973; Mellstrom & Johannesson, 2008; Rosenfield, Folger, & Adelman, 1980).

In the attempt to explain the overjustification effect, several theoretical frameworks were developed. Self-perception theory (Bem, 1967) posits that people make inferences about their behavior on the basis of external constraints. The use of external rewards predisposes individuals to attribute the reason for their own behavior to external contingencies, shifting their explanation from intrinsic to extrinsic reasons. Alternatively, cognitive evaluation theory (Deci, 1975) suggests that extrinsic rewards, particularly monetary, are perceived as being coercive and detracting from the individual’s sense of control. Therefore intrinsic motivation is inhibited by external rewards. Consistent with self-determination theory (de Charms, 1968; Deci, 1971), external rewards diminish perceptions of competence, increase external perceived locus of causality, and promote disinterest in the activity (Deci & Ryan, 1985). However, certain kinds of external regulation, such as feedback and praise, can facilitate perceived competence, increase a sense of autonomy, and positively
affect intrinsic motivation. Nonetheless, this research further made apparent the
distinction between intrinsically and extrinsically motivated behavior.

“Flow”

It was against this intellectual backdrop that Mihaly Csikszentmihalyi, a PhD student
at the University of Chicago, began studying the psychology of creativity. While
studying artists Csikszentmihalyi became interested in why painters would engage
in art in the absence of extrinsic rewards, food, drink, and sleep, and despite consid-
erable physical discomfort (Csikszentmihalyi, 2000). In other words, he noticed that
the creative process of artists seemed entirely intrinsically motivated and he began
a systematic exploration of the associated experience. In the early 1970s Csikszent-
mihalyi and several graduate students began to interview individuals about their
subjective experiences in a variety of intrinsically motivated activities, including
rock-climbing, chess, dancing, basketball, and surgery. These studies were to form
the basis of flow theory.

Originally, the term autotelic state was used to describe this self-directed optimal
experience, from the Greek words auto (meaning ‘self’) and telos (meaning ‘goal’).
The label ‘flow’ derived from the descriptions provided by several interviewees who
recurrently emphasized the fluid process of playful effort and concentration as like
being carried along on a stream of water. Csikszentmihalyi defined this dynamic
state as “the holistic sensation that people feel when they act with total involvement”
(1975, p. 36). Regardless of the activity surveyed, flow was consistently described as
a mental state of being totally immersed in, and absorbed by, an enjoyable activity.
Both qualitative and quantitative research over a variety of work and leisure activi-
ties indicated that the experience of flow consists of the following six components
(Nakamura & Csikszentmihalyi, 2009):

1 An intense focus and concentration on the task at hand.
2 A merging of action and awareness in that the activity becomes spontaneous
   and automatic.
3 A sense of control over what one is doing.
4 A loss of self-consciousness and a lack of concern for or about oneself.
5 A transformation of one’s perception of time passing.
6 A sense of enjoyment in the intrinsic motivation of the activity.

While these six experiential components are considered essential indicators of
flow and discussed as discrete entities, it is important to understand that an indi-
vidual experiencing flow is unlikely to be aware of any particular component. The
indicators of flow are experienced simultaneously, which is to say that flow is a
holistic experience, a by-product of an individual being consumed in an intrinsi-
cally motivating activity.

In line with theories of intrinsic motivation that emphasize regulatory com-
patibility between individual characteristics (e.g., skill level, need for achievement
and dispositional factors) and situational characteristics (e.g., the demands of the task, goal clarity, and resources; Keller & Bless, 2008), three preconditions were identified as necessary to induce flow. These may be argued to be structural task characteristics rather than components of the subjective experience of flow (Nakamura & Csikszentmihalyi, 2009). The first precondition – one of the core tenets of flow theory (Csikszentmihalyi, 1990, 1997) – is represented by an optimal balance between the challenges that individuals perceive in the task and the skills that they perceive to possess in performing the task. Typically, both skills and challenge must be at a moderate to high level to experience flow (Csikszentmihalyi, 1975; Massimini & Carli, 1988; Massimini, Csikszentmihalyi, & Carli, 1987; Sartori et al., 2014). When the task is overly challenging, there is a greater likelihood that individuals will experience anxiety and stress (Sartori & Delle Fave, 2014). Flow and performance anxiety have been shown to be incompatible and mutually exclusive states (Fullagar, Knight, & Sovern, 2013). On the other hand, if the task is too easy, there is the tendency for the individual to experience boredom and apathy (Delle Fave & Massimini, 2005). The importance of challenge/skill balance in flow theory has been empirically supported by several studies (Bassi, Ferrario, Ba, Delle Fave, & Viganò, 2012; Delle Fave & Bassi, 2000; Delle Fave & Massimini, 2004, 2005; Delle Fave, Bassi, & Massimini, 2003; Eisenberger, Jones, Stinglehamber, Shanock, & Randall, 2005; Engeser & Rheinberg, 2008; Fullagar et al., 2013; Haworth & Evans, 1995; Hektner & Asakawa, 2000). However, some of these same studies also showed that relatively high levels of flow can be experienced when skills exceed challenge, suggesting that the relationship between the challenge of a task and the skills necessary to perform it may be moderated by certain task-related factors (Engeser & Rheinberg, 2008; Fullagar et al., 2013; Hektner & Asakawa, 2000). Specifically, both the volitional nature and the perceived importance of the task have been shown to be essential moderators. Tasks that are engaged in voluntarily (e.g., practicing a musical instrument, knitting, and cooking) may induce flow, even though they may not be particularly challenging given the skill level of the performer (Fullagar et al., 2013; Hektner & Asakawa, 2000). Also, flow can be experienced when the activity is not particularly challenging but is important and meaningful to the actor (Engeser & Rheinberg, 2008).

A second precondition of flow is that the task should have clear intrinsic and proximal goals (Csikszentmihalyi, 1990, 1997). This is consistent with goal-setting theory that stipulates that most human behavior is goal-directed (Locke, Shaw, Saari, & Latham, 1981). A considerable amount of empirical evidence suggests that goals are a crucial component of human motivation and are strongly associated with the effort, persistence, and direction of work-related behavior (Pinder, 2008). However, there is at least one important distinction between goal-setting theory and flow theory relative to goals. Goal-setting theory has mostly focused on the relation between extrinsic goals and task and extra-role performance (Ryan & Deci, 2000), while flow theory has mostly emphasized intrinsic goals and their relation to constructs like satisfaction and well-being (e.g., Sheldon et al., 2004). Waples, Knight, and Fullagar (2013) found that establishing extrinsic goals increased
performance on a task, but inhibited the experience of flow. These results corroborate the overjustification effect (Deci, Koestner, & Ryan, 1999, 2001) in that they suggest that goals may constitute an external constraint, similar to extrinsic rewards that shift an individual’s attention away from the intrinsic enjoyment of the task to achieving some external performance demand. Self-perception theory (Bem, 1967) and cognitive evaluation theory (Deci, 1975) propose that extrinsically imposed goals shift attribution for behavior, and control of behavior, from internal to external causes and constraints, and consequently decrease intrinsic motivation (Waples et al., 2013). It would seem, therefore, that goals are an important precondition to flow, but that these goals must be inherent in the task and not externally imposed as a performance criterion. Other empirical evidences (Bassi & Delle Fave, 2012b; Delle Fave & Massimini, 2005) further suggest the usefulness of distinguishing between goal pursuit (the volitional component of motivation) and activity desirability (related to the distinction between intrinsic and extrinsic motivation) in the assessment of flow. This aspect is specifically related to the so-called paradox of flow at work, which will be discussed in detail in the following pages, and in several chapters of this volume.

The final (and least researched) precondition to flow is that the task should provide the individual with clear feedback, particularly with respect to how much progress is being made toward achieving the goals inherent in the task (Csikszentmihalyi, 1990, 1997). However, to maximize the impact of feedback in facilitating flow, it is important that the individual believes that it is his or her own skills, efforts, and abilities that are instrumental in the successful performance of the task (Thomas & Mathieu, 1994).

**Flow and work**

The first conceptualizations of flow were motivated by an interest in understanding the enjoyment of creativity and play (Csikszentmihalyi, 2000). In the early 1970s psychology, Mihaly Csikszentmihalyi had just started a faculty position at the University of Chicago and realized that extramural funding would be necessary in order to develop his program of research. He submitted a grant proposal to the National Institute of Mental Health to study playfulness in the context of work satisfaction (Csikszentmihalyi, 2000). The outcome of this project was Csikszentmihalyi’s first ‘flow’ publication, *Beyond Boredom and Anxiety* (subtitled *Experiencing Flow in Work and Play*). In this book, Csikszentmihalyi (1975) argued that the distinction between leisure and work activities is artificial and that there are many work-related activities that are highly enjoyable and self-motivating. One of the objectives of the original research on flow was to study both play and work activities to ascertain if the same intrinsically motivating characteristics pertained to both domains (Csikszentmihalyi, 1975). The study included participants engaged in a variety of occupations, including surgeons, musical composers, and teachers.

This early investigation produced several valuable insights about the nature of optimal experience (a synonym of flow) at work. First, the reasons for enjoying
work and leisure activities were remarkably similar. Consistently, and regardless of
domain, people reported to engage in an activity because it provided (a) a sense
of enjoyment; (b) the opportunity to use and develop skills; and (c) a structure or
pattern (Csikszentmihalyi, 1975). Second, the psychological characteristics (intense
concentration, action/awareness merging, sense of control, loss of self-consciousness,
time distortion, and enjoyment) and the preconditions (challenge/skill balance,
goal clarity, and feedback) of flow were relatively reliable and consistent across all
the types of activities studied. Third, and perhaps most importantly, regardless of
whether individuals were climbing mountains, playing chess, or performing surgery,
they tended to report enjoying those activities that enabled them to challenge the
limits of their abilities and provide opportunity for their expansion. These early
findings suggested that the dichotomy between work and leisure activities may be
arbitrary and perhaps even meaningless. The nature of enjoyable, intrinsically moti-
vating activities is the same regardless of whether those activities are performed at
work or at leisure.

There is growing evidence that workers tend to spend more time in flow during
work rather than in leisure activities. Some studies show that enjoyment, concen-
tration, activation, and creativity are higher in work-related flow than in leisure
activities (Csikszentmihalyi & LeFevre, 1989; Delle Fave & Massimini, 2003; LeFevre,
1988). This may be due to work having a greater potential to offer tasks that pro-
mote the perception of an optimal balance between high challenges and high skills.
Nonetheless, an interesting paradox has been revealed about the quality of the flow
experience at work. Even though workers report experiencing flow more often at
work, they also report a desire to be doing something other than the flow-inducing
work activity (Bassi & Delle Fave, 2012a; Hektner, Schmidt, & Csikszentmihalyi,
2007). It is possible that social conventions about work and the obligatory nature
of work may mitigate the positive experience of flow-inducing work (Csikszent-
mihalyi & LeFevre, 1989). Another possibility is that flow activities at work are
fatiguing. Debus, Sonnentag, Deutsch, and Nussbeck (2014) found that levels of
flow decreased steadily throughout the day for workers who started their workday
in a state of nonrecovery.

The paradox of flow at work has also been explained in terms of the two facets
of motivation described earlier – namely, goal pursuit and activity desirability (Delle
Fave, 2007; Delle Fave & Massimini, 2005; Haworth & Hill, 1992). Flow is often
described as an intrinsically motivated, self-determined state (Keller & Bless, 2008)
that is disrupted by external regulations and controls. However, work consists of
both extrinsic and intrinsic motivational conditions. Research has shown that the
occurrence of flow experience during required work activities is contingent on
whether individuals want to do them and would not rather be doing something else
(Haworth & Hill, 1992). Self-determination theory distinguishes between different
types of intrinsic and extrinsic motivations and has been used to explain the paradox
of flow at work. Flow can be experienced in tasks that are compulsory and exter-
nally regulated, if individuals find the task to be meaningful, and to challenge their
professional abilities (Bassi & Delle Fave, 2012a, 2012b). Consequently, the paradox
of flow at work does not seem to be purely determined by the extent of autonomous
regulation that the work provides. Optimal experience in the workplace is more
contingent on the meaningfulness of the work and the opportunity it provides for
the expression of personal and professional skills. Both the structure of job tasks and
social dimensions play a role in this aspect, thus raising the issue of possible vari-
ations in the flow paradox based on the typology of occupation under examination,
especially its potential for creativity, self-expression and growth, social contribution,
and competence development. An extensive cross-cultural comparison between
different typologies of jobs highlighted that people involved in highly challeng-
ing, socially meaningful, and creative work activities, such as helping professions,
arts, and crafts, do not report the flow paradox in their work experience (Delle
Fave, Massimini, & Bassi, 2011; Delle Fave & Bassi, this volume; Delle Fave & Zager
Kocjan, 2017).

A developing framework for flow at work

Over the last forty years, there has been an increasing interest in the construct of
flow among both scientists and practitioners. Although the core components of
flow were found to be remarkably consistent across work contexts, different theo-
retical frameworks have been used to explain flow’s nomological network. The
most popular model used to identify the characteristics of tasks that generate flow
is Hackman and Oldham’s (1980) job characteristics model (JCM). This is not
surprising, given that the model identifies five core characteristics of work tasks
inducing critical psychological states (CPS) that in their turn influence affective
and behavioral outcomes (Hackman & Oldham, 1975, 1980). The first character-
istic is skill variety, which refers to the degree to which the job requires different
activities and skills to carry out the task; task identity is the extent to which the
job requires completion of a whole and identifiable piece of work; task significance
indicates the degree to which the job has a meaningful impact on other people;
autonomy refers to the extent to which the worker has independent discretion in
determining the schedule and process of work; and feedback is the extent to which
the job provides the worker with information concerning how well he/she is per-
forming. The relationship between these core job characteristics and their affective,
motivational, and behavioral outcomes is mediated by three CPS: perceived work
meaningfulness, individual responsibility, and knowledge of results. Findings from
several studies highlighted both direct and indirect effects of job characteristics on
CPS and their affective and behavioral outcomes, and the partially mediating role
of CPS in the relationship between job characteristics and their outcomes (Renn &
Vandenberg, 1995).

Both flow theory and the JCM propose characteristics inherent in work tasks
that make work meaningful and foster positive experiences. As specified earlier,
flow preconditions are similar, if not identical, to those outlined by Hackman and
Oldham (1975, 1980). For example, both theories emphasize (a) that tasks should
require the exercise of skills, (b) that the activity should be goal-directed or have task
identity, and (c) the importance of job-specific feedback. Some researchers suggest that flow is a critical psychological state that mediates the relationship between core job characteristics and several performance, motivational, and well-being outcomes. For example, Demerouti (2006) found a positive relation between a global measure of motivating core job characteristics and flow at work, as well as between flow and both in-role, or job-specific, and out-of-role, or citizenship, behaviors. Subsequent research (Fullagar & Kelloway, 2009; Maeran & Cangiano, 2013; Nielsen & Cleal, 2010; Steele & Fullagar, 2009) has empirically validated that specific core job characteristics, such as autonomy, skill variety, task significance, and feedback from the task, increase the likelihood that people will experience flow at work. In addition, Nielsen and Cleal (2012) identified role clarity as a stable job characteristic predictive of flow, and planning, problem solving, and evaluation as specific work tasks conducive to flow.

Another theoretical framework used to understand flow in the workplace is the job demands-resources (JD-R) model (Bakker & Demerouti, 2014; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The JD-R model classifies the characteristics of jobs into two general categories: job demands and job resources. Demands are physical, psychological, and organizational aspects that are depleting and extol a personal cost. Resources, on the other hand, are those aspects that reduce job demands and enhance functioning and stimulate personal growth, learning, and development (Bakker & Demerouti, 2007). Several studies have established the positive relationship between job resources and flow. For example, social support, opportunities for professional development, and supervisory coaching have been found to be positively associated with optimal experience (Mäkikangas, Bakker, Aunola, & Demerouti, 2010). Similarly, a longitudinal study conducted among secondary school teachers highlighted that both personal resources (self-efficacy beliefs) and job resources (social support and goal orientation) facilitate work-related flow, which in turn builds on personal and organizational resources, suggesting an upward spiral effect of flow (Salanova, Bakker, & Llorens, 2006). This view is consistent with Fredrickson’s (1998, 2001) theory proposing that momentary positive affective experiences (e.g., flow) have the ability to broaden thought-action repertoires and build personal resources, thus engendering upward spirals of well-being.

Furthermore, because positive emotional experiences enhance personal resources they also increase resilience. Recent studies showed that the daily experience of work flow impacts positively on resiliency by reducing the demands of the job and facilitating the recovery process (Debus, Sonnentag, Deutsch, & Nussbeck, 2014). Nonwork recovery was also found to influence flow experiences during subsequent workdays (Debus et al., 2014). These studies emphasize the importance of blending personal resources and task characteristics as predictors of flow.

Much less research has been undertaken on the outcomes of flow. Recently Landhäußer and Keller (2012) summarized some of the affective, cognitive, and behavioral consequences of optimal experience. Flow, as an experiential phenomenon, is characterized by positive affect (e.g., Clarke & Haworth, 1994;
Csikszentmihalyi & LeFevre, 1989; Fullagar & Kelloway, 2009; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003). While flow features can be evaluated through cross-sectional design studies, flow outcomes can be investigated only through a longitudinal approach. Fullagar and Kelloway (2009) conducted a longitudinal, repeated measures study that tracked architectural students over the course of a semester in order to establish the causal, cross-lagged relationship between flow and positive affect. The results of this study indicated that flow was indeed a precursor to positive mood rather than mood being predictive of experiencing flow. Finally, a longitudinal study that tracked fifty-four older adults over seven consecutive days found that quality or intensity of the flow experience (rather than frequency) was significantly and positively associated with positive affect and life satisfaction (Collins, Sarkisian, & Winner, 2009).

Several studies have investigated the consequences of flow in the context of work. Engagement in flow-inducing work activities has been shown to affect worker well-being and organizational functioning. For example, the experience of flow is associated with job satisfaction (Bakker, 2008; Maeran & Cangiano, 2013) and positive mood (Eisenberger et al., 2005; Fullagar & Kelloway, 2009; LeFevre, 1988). Flow has also been correlated with both in-role and extra-role performance (Demerouti, 2006; Eisenberger et al., 2005). However, these relationships were found to be moderated by dispositional characteristics, such as the need for achievement (Eisenberger et al., 2005), conscientiousness (Demerouti, 2006), and the ability to persevere and stay focused on the task (Keller & Bless, 2008). Flow at work has also been found to have nonwork repercussions. Specifically, the absorption and enjoyment aspects of flow have been found to impact energy after work. Flow’s ability to buffer the effects of stress and to facilitate recuperation is moderated by the individual’s ability to manage work-related stress and to detach from work (Demerouti, Bakker, Sonnentag, & Fullagar, 2012).

Of course, the ‘big’ question about the utility of flow in the workplace resides in the notion of whether optimal experience is associated with optimal performance. Flow has been correlated to athletes’ peak performance (Jackson & Roberts, 1992; Jackson, Thomas, Marsh, & Smethurst, 2001; Stein, Kimiecek, Daniels, & Jackson, 1995). However, the relationship between flow and performance may be an indirect one. For example, the association between flow and sport performance has been found to be mediated by the motivation to practice athletic skills (Schüler & Brunner, 2009).

A few studies have investigated the relationship between flow and performance at work. In an academic setting, flow was found to be predictive of successful performance by students in their area of specialization (Csikszentmihalyi, Rathunde, & Whalen, 1993). More specific to the workplace, flow was found to be associated with optimal performance (Demerouti & Fullagar, 2013), as measured through work colleagues’ ratings of in-role (perceived expertise) and extra-role (citizenship behaviors) performance (Demerouti, 2006). The relationship between flow and both types of performance
was moderated by conscientiousness. Other studies detected a positive relationship between skill/challenge balance and supervisor ratings of individual work performance. This relationship was moderated by need for achievement (Eisenberger et al., 2005). It would appear that the impact of flow on work performance may be facilitated by its positive affective components. Positive mood has been shown to have a favorable impact on performance in a variety of domains (Bolte, Goschke, & Kuhl, 2003; Fredrickson & Branigan, 2005; Isen, Daubman, & Nowicki, 1987). This is particularly so for tasks requiring spontaneity and creativity (Eisenberger & Rhoades, 2001; George & Brief, 1992). The experience of flow in computer interactions has been found to foster greater communication effectiveness and other positive work outcomes (Webster, Klebe Trevino, & Ryan, 1993). Similarly, a reciprocal relationship was detected between the experience of flow and job resources (e.g., autonomy, performance feedback, opportunities for promotion) among workers in an employment agency (Mäkkikangas, Bakker, Aunola, & Demerouti, 2010). These longitudinal studies suggest that the relationships between flow at work, personal and organizational resources, and positive work outcomes are reciprocal and dynamic, as well as convergent with the literature on positive emotions at work, in spite of the conceptual and structural differences between the experience of flow and positive emotions.

Experimental studies have also been conducted to explore the relationship between flow and performance, but they prominently focused on video games, and therefore their ecological validity as applied to performance on more complex and extended work tasks is questionable. Moreover, these studies did not provide clear-cut results. In one of them, a marginally significant and positive effect of flow on performance was detected (Engeser & Rheinberg, 2008); in another, a negative relationship between flow and performance goals (Waples et al., 2013), but in most of the other studies flow was not associated with performance (Keller & Bless, 2008; Keller & Blomann, 2008; Schiefele & Roussakis, 2006). These mixed results may be attributable to both the differences in flow operationalization across these studies and the shared choice of task difficulty as primary manipulation, which may represent a confounding variable when assessing performance (Landhäußer & Keller, 2012).

In Chapter 8 of this book, Knight and Waples argue that imposing external performance goals on a task may actually inhibit the flow experience and produce a negative relationship between flow and performance. The only experimental study that has applied goal-setting theory to flow found that setting external performance goals predictably increased performance on the task but detracted from the performer’s experience of flow (Waples et al., 2013). This raises the question as to whether flow is necessarily good for work organizations. Absorption in a work-related task to the extent that one loses a sense of time and is unconcerned about others’ opinions may not be appropriate in many work environments, where deadlines are important and results can often be achieved only in teams. There is evidence to suggest that flow has beneficial consequences
for the individual, but the organizational benefits are more uncertain. Furthermore, being engaged in a highly challenging task that requires high skill use for extensive periods of time was found to be associated with negative stressful outcomes (Hektner et al., 2007). More research is needed to ascertain the positive and negative consequences of flow both for the individual and the organization, and the task, situational, and personal moderators of the two different kinds of outcomes.

Nonetheless, the predominance of research indicates that flow promotes optimal functioning. Research with students suggests that those who experience flow during academic work perform better and are more persistent in their academic studies (Bassi, Steca, Delle Fave, & Caprara, 2007; Csikszentmihalyi et al., 1993). Adolescents experiencing flow reported higher satisfaction with life, hedonic balance, and psychological well-being than their counterparts (Bassi, Steca, Monzani, Greco, & Delle Fave, 2014). Flow has also been positively associated with work satisfaction (Bryce & Haworth, 2002), in-role behaviors (Demerouti, 2006), and extra-role behaviors (Demerouti, 2006; Eisenberger et al., 2005).

In sum, there is growing evidence that exposure to positive work experiences, such as work-related flow, has beneficial consequences for both the individual and the organization (Bringsén, Andersson, Ejlertsson, & Troein, 2012). A salutogenic emphasis that focuses on the positive promotion of health is an important aspect of positive organizational scholarship and is complementary to the more predominant pathogenic perspective that emphasizes stress reduction (Bringsén et al., 2012). Researchers, employers, and stakeholders are increasingly aware that work needs to be crafted so that individuals can frequently experience positive states and increase the meaningfulness of what they do (Berg, Wrzesniewski, & Dutton, 2010). Job crafting has been found to be beneficial for the meaningfulness of work and work identity (Wrzesniewski & Dutton, 2001), as well as to improve job satisfaction, commitment, and performance (Ghitulescu, 2006). Furthermore, job crafting was found to be positively associated with work engagement (Bakker, Tims, & Dirks, 2012). There is some evidence that the process of job crafting can induce the flow experience and consequently its subsequent positive outcomes (Ko, 2011).

Such findings have important practical implications. Organizations wishing to enhance employees’ intrinsic motivation and increase optimal work experience are well-advised to enable workers to engage in tasks that require a breadth of skills and that instill a sense of autonomy and control.

**Some remaining questions**

The early research on flow in the workplace has raised more questions about the construct than it has resolved. This book is an attempt to provide some initial answers to some of these questions. We would like to end this chapter with what we see as the main issues confronting researchers if flow is to establish itself in the lexicon of organizational psychological constructs.
Flow: state or trait?

The overarching purpose of positive psychology is to develop a scientific understanding of what makes individuals thrive and life more fulfilling (Seligman & Csikszentmihalyi, 2000). It is not surprising therefore that the construct of flow is relevant to the movement. Luthans (2002) has termed the application of positive psychology to the workplace positive organizational behavior (POB). He defines POB as “the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement” (Luthans, 2002, p. 58). This definition includes several criteria that are important in determining flow’s potential to contribute to our understanding of behavior at work. Specifically any POB construct should be (a) positive, (b) measurable, (c) useful to promote better performance, and (d) capable of being developed (Luthans, 2002). We have already established that flow is both a positive and measurable psychological state. Later on we will outline research that has established its association with optimal performance. To establish whether flow is capable of being developed requires determining whether it is a state or a trait construct.

The identification of the state-like or trait-like nature of flow has important practical and theoretical implications. If flow is trait-like, then the implications for organizations center around selecting individuals who have a predisposition for optimal experience. If flow is a fluctuating state, then the focus becomes crafting jobs to enable individuals to experience flow. It has long been acknowledged that a trait is a reliably permanent internal disposition that has a limited potential for development (Allport & Odbert, 1936). On the other hand, a state construct is more variable and reactive to situational contingencies (Allen & Potkay, 1981). There is some debate as to whether flow should be classified as a state or a trait. Conventionally, flow has been defined as a transitory state of mind, existing at a given moment in time, and reactive to the nature of the task that is being performed (Fullagar & Kelloway, 2009; Delle Fave, 2013). Nonetheless, Csikszentmihalyi has made reference to an “autotelic personality” (Csikszentmihalyi & Csikszentmihalyi, 1988, p. 31), hypothesizing individual differences in the propensity to experience flow when engaged in challenging tasks. Some measures of flow, such as Bakker’s (2005) WOLF inventory, and Jackson and Ecklund’s (2004) Dispositional Flow Scale, instruct respondents to rate their tendency to experience flow “in general” over a period of time, in an attempt to assess enduring levels of the experience flow. However, flow has been prominently investigated as a temporary experience, evaluated through real-time procedures, such as the experience sampling method (ESM), whereby participants are required to respond to a short survey that assesses their cognitive, emotional, and physical state at a particular moment in time (Hektner et al., 2007). ESM is designed to capture the situational fluctuations in the daily experience (inclusive of flow) with minimal recall bias. The experience sampling approach presumes that flow is a dynamic state that fluctuates across time and activities. One recent study (Fullagar & Kelloway, 2009) that used ESM
to assess momentary vacillations in work flow among architecture students found that within-individual variation accounted for nearly 75% of the overall variance in flow. This suggests that flow is more susceptible to situational and task-related characteristics compared to dispositional factors.

Studies of flow in a variety of cultures showed that 85% of the participants reported flow in their life, regardless of demographic features, such as age, socio-economic status, level of education, and occupation. No variations were detected across groups in the psychological structure of flow experience, while differences emerged in the typology of associated activities (for a review, see Delle Fave et al., 2011). Another recent study investigating the relationship between flow and personality among adolescents showed that, among the big five personality traits, only openness to experience predicted flow occurrence, and no personality factors were predictive of the activity typologies that participants associated with flow (Bassi et al., 2014).

Nevertheless, individuals may vary in their propensity to regularly experience flow (Asakawa, 2010; Jackson, Kimiecik, Ford, & Marsh, 1998). Personality characteristics such as inquisitiveness and aestheticism have been associated with flow (Shernoff et al., 2003). Similarly, a relationship has been shown between flow and intrinsic motivation orientations among teenagers and college students (Moneta, 2004, 2010) and among Internet chess players (Abuhmadhe & Csikszentmihalyi, 2009). The joint investigation of both the trait and state properties of flow has highlighted that individual dispositional characteristics may also moderate the relationship between the nature of the task and the experience of flow. For example, individuals who tend to persevere at tasks are more likely to be sensitive to the balance between challenge and skill that is an important component of flow-inducing tasks (Keller & Bless, 2008). The need for achievement was found to moderate the relationship between task-related flow and positive emotional and organizational spontaneity (Eisenberger et al., 2005). Specifically, tasks that matched challenges with skills were associated with positive emotions (feeling energetic, enthusiastic, and happy), greater interest in the task and increased involvement in the organization only among individuals who had a high need for achievement. A study conducted among workers from several occupations showed that conscientiousness moderated the relationship between flow and both in-role and extra-role performance (Demerouti, 2006).

Even though some evidence suggests the existence of an autotelic personality type, in that some individuals are more prone to experience flow when confronted with a challenging task, the majority of findings indicate that flow is predominantly a task-related state. This has important practical implications for work organizations. Because flow is a state-like construct, it dynamically changes across time and situations. Therefore, it is possible to reshape the workplace and design tasks that increase the likelihood of optimal experience. As we have argued earlier, such crafting of work has beneficial consequences for both the individual and the organization.
Flow: a collective phenomenon?

Most researchers have studied flow at the individual level rather than in social or collective settings (Walker, 2010). Typically, optimal experience is researched on individuals engaged in isolated activities where they can focus their attention on the task at hand, without external distractions interfering with their state of absorption. However, in organizations much work is performed in groups or teams. Confronted with the increasing complexity of the workplace technology and the need to compete more efficiently and effectively in a rapidly changing global economy, organizations have substantially implemented teamwork (Yang & Guy, 2011). Group work represents a more effective way of dealing with complex information and knowledge systems, at the same time increasing worker participation in decision-making (Kozlowski & Ilgen, 2006).

Social comparison theory (Festinger, 1954) and social validation theory (Cialdini, 2009) suggest that cognitions, attitudes, emotions, and behaviors are influenced by comparisons with others in a group, such that there is a tendency toward normative compliance. Yet little research has been undertaken on understanding flow as a collective or social phenomenon, and very few studies have investigated collective flow in the workplace.

Although the preconditions of flow (i.e., challenge/skill balance, goal clarity, and feedback) should be similar for both individuals and groups, three studies showed that the experience of flow is qualitatively different between the two conditions, being more enjoyable in a group rather than a solitary setting (Walker, 2010). This was particularly evident for tasks that required group members to be interdependent, coordinated, and cooperative. Furthermore, in social flow participants reported a heightened awareness of what was going on in the group environment, rather than an attempt to exclude situational characteristics. This finding suggests that in social contexts the individual’s awareness of self becomes subsumed under the group awareness (Walker, 2010). There is also recent empirical evidence that flow may be enhanced in collective settings by social facilitation and emotional contagion effects (Páez, Rimé, Basabe, Wlodarczyk, & Zumeta, 2015). In the academic context, flow has been found to cross over from music teachers to their students (Bakker, 2005), and from students’ classmates and instructors in the classroom (Culbertson, Fullagar, Simmons, & Zhu, 2015). Results from a recent longitudinal study (Salanova, Rodríguez-Sánchez, Schaufeli, & Cifre, 2014) confirmed that collective flow in work groups is associated with collective efficacy beliefs, including that the group is skilled enough to meet the challenges of the task. These findings suggest that the same preconditions that are necessary to experience solitary flow are also predictive of collective flow, at the same time highlighting similarities and some distinct differences between the two conditions at the experiential level. Collective flow is “something more than the sum of individuals’ flow experiences” (Salanova et al., 2014, p. 450). Given that work groups are an essential part of organizational life, many more studies are required on collective flow, in order to understand the conditions that foster it, as well as its individual and organizational consequences.
Flow: fad or folderol?

As early as 1927, Kelley warned against the “jangle fallacy” (p. 63) – the tendency to use a different term to describe a construct that is no different from one that already exists. Dunnette (1966) referred to this as folderol and cautioned against trivial ideas packaged as new theories. A fad is a short-lived idea that has a short history and is irreproducible. In order for flow to be recognized as a unique construct in the field of work psychology, it is necessary to establish its theoretical consistency and independence from other work-related variables, as well as its specific contribution to the understanding of workplace behavior.

While research on flow has established that both its preconditions and core experiential features are remarkably consistent across work, leisure, and academic domains (Delle Fave et al., 2011; Nakamura & Csikszentmihalyi, 2009; Nielson & Cleal, 2012), in the organizational domain perhaps the closest conceptual relative to flow is work engagement. Indeed in the only published measure of work flow (the WOrk-reLated Flow inventory or WOLF), Bakker (2008) defines flow as consisting of three core components: (1) absorption or concentrated involvement in the activity, (2) enjoyment of the activity, and (3) intrinsic motivation, or the fact that the activity is rewarding in itself. These components have considerable conceptual overlap with the concept of work engagement that is defined as “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (Schaufeli, Salanova, González-Romá, & Bakker, 2002, p. 74). However, engagement represents a chronic involvement in one’s job as a whole and all of the tasks that it entails (Maslach, Schaufeli, & Leiter, 2001), whereas flow is typically described as a more acute and intense absorption and involvement with a specific work task (Csikszentmihalyi, 1975; Fullagar & Kelloway, 2013; Mills & Fullagar, 2008; Schaufeli & Salanova, 2007). Furthermore, engagement is usually operationalized as a relatively stable disposition that varies considerably between individuals (Christian, Garza, & Slaughter, 2011). However, recent diary studies indicate that there is increasing evidence that work engagement fluctuates considerably from day to day and that as much as 50% of the variance in engagement is within person (Bakker, 2014; Sonnentag, 2003). In comparison flow shows substantial within-individual variance (74%) and relatively less variation between persons (Fullagar & Kelloway, 2009). This would suggest that flow is definitely a state-like variable that fluctuates within the day, from activity to activity, and that work engagement may vary on a daily basis and is a more enduring, and long-term, state.

Flow should also be conceptually distinguished from three measures of attachment to job and organization – namely, job satisfaction, organizational commitment, and job involvement.

Job satisfaction is regarded as an affective and cognitive evaluation about one’s job (Weiss, 2002) and is considered an attitudinal variable. Typically it refers to the extent to which people like facets of their job, such as their pay, coworkers, supervision, working conditions, and so forth (Brief & Weiss, 2002). Even though flow and job satisfaction share positive cognitive components, flow also includes
behavioral components related to the task at hand, such as merging of action and awareness in a state of effortless attention (Bruya, 2010). Job satisfaction refers to a state of satiation whereas flow connotes a state of activation (Macey & Schneider, 2008). Although flow and job satisfaction have been found to be moderately correlated (Maeran & Cangiano, 2013), it is not contradictory for a worker to experience flow in certain job-related tasks, and not to feel satisfied with his or her job as a whole.

As for organizational commitment, it is predominantly defined as an affective attachment to the organization as an entity (Meyer, Becker, & Vandenberghe, 2004). In contrast, flow is a temporary experience of involvement in a specific task, in which the referent of attachment is the particular task the individual is engaged in, rather than the organization as a whole.

Finally, job involvement can be defined as “an individual’s psychological identification with a particular job” (Kanungo, 1982, p. 342). Like flow, it includes a component of intrinsic motivation to engage in work. However, job involvement is essentially a cognitive belief concerning the extent to which a job is central to the individual’s identity. As such, individuals become involved in their jobs out of a desire to fulfill self-esteem needs (Kanungo, 1982). On the other hand, tasks that induce flow are intrinsically motivating because individuals enjoy utilizing and expressing skills that meet the challenges inherent in those tasks. Moreover, contrary to the notion of job involvement, flow is associated with a loss of self-consciousness.

Both flow and job involvement have “dark sides.” Extreme levels of job involvement have been termed “workaholism” (Piotrowski & Vodanovich, 2006), a particular kind of intense work involvement that has been associated with obsessive-compulsive tendencies (Mudrack, 2004; Naughton, 1987; Oates, 1971). Workaholics tend to spend an inordinate amount of time at work, are preoccupied with work when not at work, and are driven to work beyond the role requirements of the job (Mudrack & Naughton, 2001). Empirical evidence has highlighted the dysfunctional nature of workaholism through its association with increased job stress (Burke, 2001; Kanai & Wakabayashi, 2001; McMillan, O’Driscoll, Marsh, & Brady, 2001), performance problems at work (Mudrack, 2004; Porter, 1996; Scott, Moore, & Miceli, 1997), impaired nonwork relationships (Robinson, 1999; Scott et al., 1997; Spruell, 1987), and increased work-family conflict (Burke, 2000, 2001; Taris, Schaufeli, & Verhoeven, 2005).

The early work with surgeons did reveal a “dark side” to flow. Csikszentmihalyi (1975) reports that “one surgeon mentioned that operating is ‘like taking narcotics’; another, that it is like ‘taking heroin’” (Csikszentmihalyi, 1975, p. 138). The detrimental role of flow also emerged in a study conducted among musicians suffering from playing-related injuries. The flow-related dissociation from body and time entailed the risk of engaging in excessively prolonged practice by virtue of a lower perception of pain (Guptill, 2012). Musicians in this study described the strategies adopted to interrupt or avoid flow in order to protect their own health. Nevertheless, flow can be distinguished from workaholism in several ways. First,
workaholism as a form of addiction has been associated with obsessive-compulsive tendencies (Mudrack, 2004), anxiety, and stress (Schaufeli et al., 2002). Flow is instead characterized by positive emotions (Fullagar & Kelloway, 2009), and at the physiological level it is identical to joy (De Manzano, Theorell, Harmat, & Ullén, 2010). Furthermore, empirical work has shown that flow and anxiety are incompatible states. In a study of musicians, it was shown that when flow was at its highest, performance anxiety was at its lowest and vice versa (Fullagar et al., 2013). Second, a consistent association was detected between workaholism and impaired nonwork relationships (see Piotrowski & Vodanovich, 2006, for a review). Flow, on the other hand, is a functional type of work engagement and, as such, should enhance both work and family roles (Bakker, Petrou, & Tsaousis, 2012; Marks, 1977; Sieber, 1974), and improve interpersonal relationships (McMillan, Brady, O’Driscoll, & Marsh, 2002).

Despite these conceptual distinctions between work flow and other work-related constructs, the incremental value of flow over and above these other constructs in predicting behavior in the workplace has not been established yet. We see this as an important focus for future research.

At the methodological level, further efforts are needed to understand the phenomenology of flow in real time, through procedures such as ESM. More specifically, it is not yet clear how individuals enter flow moving from other experiences, or move from flow to other states. Studies are also needed to evaluate whether there are predictable patterns of experience fluctuation during a workday, and whether there may be a “critical” experiential configuration leading to flow, as suggested by preliminary evidence based on nonlinear dynamical system models (Ceja & Navarro, 2012, this volume). Moreover, in order to clarify the interplay among demographic factors, environmental dimensions, traits, and state variables in the occurrence of flow on the work context, studies should include multiple measures jointly evaluating these aspects. Finally, more qualitative studies should be conducted, in order to give voice to the workers, and to let them highlight components of the work experience – especially those concerning job-related meanings – that have not been explored yet, and that could be worth investigating. Although qualitative studies are cumbersome and less popular and less scientifically fashionable than quantitative ones, psychologists often forget that the reality of human experience is much more complex and articulated than the information emerging from numbers.

At a more general level, flow research in the domain of work substantially ignores a great variety of jobs that people are engaged in worldwide. Most studies on flow at work involve office employees, and – to a lesser extent – teachers and health professionals. Except for few and scattered studies (briefly summarized by Delle Fave and Bassi, this volume) the experience of the vast majority of workers is completely overlooked. Widespread and essential jobs, such as agriculture, handicrafts, animal husbandry, arts, semiskilled works performed in factory and workshop contexts, professional caregiving, domestic aid, and many other occupations, are ignored by flow research, and overall by the psychological literature. The reasons for this massive neglect of the conditions of millions of workers are various, ranging from the
low income and thus low business relevance characterizing many of these jobs to their self-employment nature, not attracting the interest of sponsors. Another related problem is the dearth of studies conducted in nonwestern countries, both on flow in general and specifically on flow at work. In an increasingly globalized world, these problems have to be addressed by psychology as a discipline concerned with human functioning.

Some concluding remarks

After this brief overview of the research on flow at work, and before merging in the related findings, we would like to challenge readers with a general warning. As most disciplines, psychology provides a unique though specific perspective on human behavior and experience, leaving other aspects in the background. Within psychology itself, the focus on a single domain – such as work – leaves the other ones in the background. This artificial dissection of the human experience may lead to distortions of reality, and it should thus be interpreted with caution. Though important, work is not the only relevant domain of individual life. According to WHO’s definition, quality of life is a multicomponental construct (WHOQOL Group, 2004), and balance across life domains is a core component of well-being. From this perspective, people experiencing moderate levels of satisfaction from multiple – and salient – life domains are likely to report higher levels of subjective well-being than people experiencing high levels of satisfaction stemming from a single – though salient – domain. In other words, it is better to be moderately happy and satisfied in multiple life domains than to experience extremely positive feelings in one single domain, to the detriment or neglect of the others (Sirgy & Wu, 2009).

Work’s contribution to people’s well-being may thus vary according to the job itself, but also to individual values, aspirations, and engagement in different life domains, as well as contextual features. The contents and values of a given culture are the result of the combined action of individuals who find meaning and opportunities for self-expression in the most varied activities and tasks (Delle Fave & Bassi, 2014). These people come from different educational backgrounds, have different access to job opportunities in their life, may experience health, financial, or social difficulties, and are exposed to changes related to life events that can suddenly modify their approach to daily activities and life as a whole. Any research study or intervention program focused on well-being at work should not overlook individual complexity and variability, perhaps the most fascinating and ever-challenging dimension that researchers and professionals working with humans have to deal with.

References


Csikszentmihalyi (1975) was fascinated by artists who spent most of their time working on paintings or sculptures while being completely immersed in the activity. The artists had the feeling that painting and sculpturing were the most important things in the world. However, as soon as they had finished their projects they lost all interest in their work, put it in a corner, and started a new painting or sculpture. How was this possible? Why did they spend most of their time working on a project and then lost all interest after they were done? When Csikszentmihalyi asked the artists what kind of reward their behavior drove, whether they wanted to become rich or famous, they denied it. It seemed that the reward of painting or sculpturing came from the activities themselves (Engeser & Schiepe-Tiska, 2012).

After this observation, Csikszentmihalyi tried to capture the phenomenon in more detail by conducting in-depth interviews with other groups of people who also reported doing activities without obvious external rewards, such as soccer and hockey players, chess players and rock climbers (Csikszentmihalyi, 1975). When analyzing the interviews, Csikszentmihalyi found characteristics that were shared by the different activities and thus started to describe the common experience as the experience of flow.

1 The flow state and its components
Flow is a state “in which people are so intensely involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it” (Csikszentmihalyi, 1990, p. 4). Flow has been conceptualized as a “holistic sensation that people feel when they act with total engagement” (Csikszentmihalyi, 1998, p. 36). In this sense, it is a multifaceted experience, which reflects a combination of different experiential states whose co-occurrence increase the likelihood of the emergence of flow.
Measuring flow at work

Engeser, 2012b; Engeser & Schiepe-Tiska, 2012). The state is characterized by six components: (a) merging of action and awareness, (b) centering of attention on a limited stimulus field and a high level of concentration, (c) loss of reflective self-consciousness, (d) high sense of control of one’s actions and the demands of the environment, (e) experience of coherent and noncontradictory demands for action (goals) and clear, unambiguous feedback, and (f) autotelic nature in the sense that there is no need for external goals or rewards and the activity is performed for its own sake (Nakamura & Csikszentmihalyi, 2009; see also Engeser & Schiepe-Tiska, 2012, for a discussion of the components).

Sometimes, the distortion of temporal experience is added as an additional component, which can go in two different directions: typically, experiencing flow comes in line with a feeling of time passing faster than normal, but sometimes it can also entail a feeling of time passing slower than normal (Nakamura & Csikszentmihalyi, 2009). These two different directions might be one explanation for the finding that distortion of temporal experience seems to be a less reliable indicator of flow as compared to the other components (cf. Jackson & Eklund, 2002).

The components of flow are linked together and depend on each other. For example, when managers experience flow while they are negotiating a business deal they may be aware of their actions – presenting numbers and arguments, convincing their counterpart, using rhetorical strategies – but they are not aware of the awareness itself; that is, they are not thinking about anything else besides the tasks they are accomplishing. This merging is accompanied by a loss of reflective self-consciousness and managers feel completely involved in and absorbed by the situation. Their full attention is concentrated on closing the deal. Managers may not even notice the vibration of their cellphone or the brief presence of their coworkers. They feel strong and in control and forget about personal problems. Time flies by, and retrospectively, they report that they enjoyed the negotiation itself independently of whether they won or lost the deal.

As a multifaceted experience, flow cannot be represented by one of these components only (Engeser, 2012b; Engeser & Schiepe-Tiska, 2012; and Section 2.2.3’s questionnaires assessing most/all components of flow). This may be further illustrated by the following example. Imagine a doctor who has a patient who is always tired. The patient sleeps badly because he/she has problems falling asleep and wakes up several times a night. The doctor could diagnose a sleeping disorder, prescribe medicines, and send the patient home. However, a good doctor may also ask how the general state of his/her health is, and whether the patient experiences a loss of interest or pleasure and a lack of drive. When the patient states these two symptoms in addition, the doctor may consider an affective disorder as the diagnosis, which would result in different medicines and treatments. In this regard, doctors always consider different symptoms in order to make a diagnosis. One symptom only may indicate several diseases but the combination of symptoms forms a specific diagnosis. The same applies to flow. For example, the component of centering attention on a limited field of stimuli
is also characteristic of a state of high anxiety (Eysenck, 1992). Thus, taking this component as a single indicator into account would not clarify what kind of state a person experiences. Only the combination with other components would explain whether the person experiences flow or anxiety.

In addition, some components of flow are repeatedly considered as preconditions of flow instead of components (Fullagar & Kelloway, 2012; Keller & Landhäußer, 2012; Nakamura & Csikszentmihalyi, 2009). According to Csikszentmihalyi (1975), the most important precondition is the balance between the demands of an activity (i.e., action opportunities) and the perceived competencies of the person (i.e., action capabilities) to accomplish a task. Most flow models are based on this precondition (Moneta, 2012). Empirical data confirm that individuals experience more flow in optimal balance conditions compared to easy and difficult conditions (e.g., Abuhamdeh & Csikszentmihalyi, 2009; Engeser & Rheinberg, 2008; Keller & Bless, 2008; Keller & Blomann, 2008; Moller, Csikszentmihalyi, Nakamura, & Deci, 2007). However, studies also reveal that a balance does not determine flow per se, but makes it just more likely (Baumann, 2012; Engeser & Rheinberg, 2008; Moneta & Csikszentmihalyi, 1996). For example, individuals do not necessarily experience a high sense of control even when demands and skills match. Consequently, we would recommend assessing the component of control as part of the experience of flow in order to assure that this component of flow is indeed experienced (cf. Engeser & Schiepe-Tiska, 2012).

Another flow component often considered as a condition of flow is that a task has clear goals and provides immediate, unambiguous feedback about one’s actions (Mannell & Bradley, 1986). Hence, the task provides a structure without forcing the individual to reflect on the behavior, and thus a person knows exactly what to do next (cf. Engeser & Schiepe-Tiska, 2012). However, as for challenge/skill balance, this characteristic makes flow more likely, but does not determine it. Individuals do not necessarily experience highly coherent, noncontradictory demands for a task that has clear goals and immediate, unambiguous feedback. Consequently, we recommend including the experience of coherent, noncontradictory demands as a component of flow as well in order to evaluate if a person is experiencing it. The same applies to all other components of flow.

In the following sections, we will describe different ways to measure flow. First, declarative measures are introduced, beginning with the interview method, which was the very first approach to assess flow. However, along with interviews, Csikszentmihalyi (1975) already started to develop short questionnaires that captured flow. Hence, second, we present questionnaires assessing (a) primarily demand-skill balance, (b) selected components and/or additional components of flow, and (c) most/all components of flow. Finally nondeclarative measurement techniques will be outlined, such as neural and psychophysiological measures. For each measurement technique, we will present its strengths and weaknesses.
2 Declarative methods to assess flow

2.1 Interview studies

When Csikszentmihalyi started with his research on autotelic activities, he used a phenomenological approach by conducting qualitative interviews. His starting point was to explore activities that offered no obvious external rewards. The first interviews were conducted with hockey and soccer players, spelunkers, and explorers, as well as with a highly trained and successful mountain climber, a handball player, and a long-distance swimmer (Csikszentmihalyi, 1975). Interviews were chosen as the method in order to give the respondents enough space to answer the questions and to give them the feeling of being in a normal conversation. From the wealth of textual descriptions, Csikszentmihalyi (1975) used some of the most common, clear, and insightful passages to describe the nature of flow experience.

For example, with regard to the work domain, surgeons were asked about their flow experience during surgeries (Csikszentmihalyi, 1975). Surgeries are episodes with a clear beginning and end. They provide a set of action opportunities within a limited stimulus field. The activities offer immediate feedback, unambiguous criteria of doing right or wrong, and, at the same time, they require high levels of concentration. Therefore, the structural characteristics of a surgery increase the likelihood of flow. For example, a surgeon who was specialized in corneal transplants described his experience as being “completely absorbed – never bored or distracted . . . Everything is important – if you don’t close it the right way, the cornea will be twisted and vision will be impaired. . . . It all rests on how precisely and artistically you do the operation” (Csikszentmihalyi, 1975, p. 128).

Another example for the use of the interview method in the workplace is the “good work in business” project (Csikszentmihalyi, 2004). Csikszentmihalyi and his colleagues interviewed visionary leaders who showed high achievement in combination with strong moral achievement (i.e., leaders who followed long-term goals with a social commitment to the society). The interviews lasted two hours and participants were asked about their general goals and purposes, beliefs and values, and work processes as well as about their formative background, community, and family, and how leaders and organizations could support workers to make flow a more likely experience at work.

Strength: The interview technique produces informative insights with regard to the description of flow and the shared characteristics. Moreover, the subjective view of participants is assessed. A description of flow is not predefined and thus people can describe their individual flow experience (and other experiences) in their own words.

Weakness: Qualitative data do not easily allow for comparisons between individuals, and it is more difficult to quantify the influence of the context and other variables. Furthermore, in interviews participants report about flow retrospectively. However, flow is characterized by a loss of reflective self-consciousness and
people are absorbed by the activity. Therefore, it may be hard to remember every detail afterwards. A retrospective story may not convey the actual experience as a whole that had taken place during the activities. In order to capture flow better, a measurement technique is needed that allows for assessing flow more closely to the situation in which it is experienced (see the experience sampling method ahead).

2.2 Questionnaires

Questionnaires with a closed answering format are more structured than interviews and ask specific questions about the experience of individuals. An important differentiation among self-report flow measures is which components of flow are represented within the items. Three approaches can be differentiated. First, the component of challenge/skill balance is central in the questionnaire. Based on the flow channel model (see ahead), the demands and skills are assessed in order to quantify if individuals are experiencing flow. Second, flow is assessed by selected components. Typically, with this approach, new components beyond those presented earlier are included in a questionnaire in order to form what the constructors define as flow. Third, flow is measured by most or all of its components. In the following, each approach will be presented and examples as well as references are provided.

2.2.1 Questionnaires assessing flow on the basis of the demand-skill balance

Most of the questionnaires that assessed flow through the demand-skill balance were based on traditional flow models. For example, the flow channel model (Csikszentmihalyi, 1975) states that flow occurs when the demands of a situation are in balance with the perceived skills of a person. When there is a mismatch and demands compared to skills are too high, the individual experiences anxiety. In the case of too-low demands, the experience of boredom is expected. A refinement of the model proposes that flow occurs only when demands and skills match on a high level (Csikszentmihalyi & Csikszentmihalyi, 1988). This model is known as the quadrant model as it specifies four qualitative different states of experience (anxiety, flow, boredom, apathy). A further refinement was provided by Massimini and colleagues (Massimini & Carli, 1988; Massimini, Csikszentmihalyi, & Carli, 1987), differentiating eight sectors or “channels” (for a review on these models see Moneta, 2012). Irrespective of how many states of experience are specified, the match between demands and skills indicates whether flow occurs.

The measure of flow via the demand-skill balance is primarily applied in studies using the experience sampling method (ESM). The ESM was developed in order to feel the “pulse of an inner experience” and to study flow patterns in everyday life (Csikszentmihalyi, Larson, & Prescott, 1977). With this method, individuals receive signals at random times during waking hours of a usual week. Every time they get beeped, participants complete a short questionnaire (see ahead). The ESM provides rich, ecological valid data that are assessed in an economic way as researchers can
Measuring flow at work

study people’s behavior and emotions directly at work or in their leisure time. ESM is particularly valuable when one is interested in how flow is changing across time at a within-person level (e.g., Debus, Sonnentag, Deutsch, & Nussbeck, 2014; Engeser & Baumann, 2014; Fullagar & Kelloway, 2009). As a dynamic, fluctuating state, flow can be better captured when it is assessed over a period of time as compared to measuring it only once during an activity. Hence, the ESM has become a highly valued research method within flow research (cf. Moneta, 2012) as well as for other kinds of research questions (e.g., Shiffman, Stone, & Hufford, 2008).

The ESM can be used with all kinds of questionnaires (of flow). Besides its great advantages, it has the drawback that the assessment as well as the data handling and analyses can be time-consuming and labor-intensive. However, after the development of new technologies for collecting the data, such as smartphones, or multilevel techniques for analyzing them, it has become more convenient. In addition, individuals get beeped during the day (normally seven times that are randomly selected) over a defined period of time, and thus researchers are likely to miss low frequent activities (Scollon, Kim-Prieto, & Diener, 2003).

The questionnaire that has been originally used with the ESM is the Experience Sampling Form (ESF; Csikszentmihalyi & Csikszentmihalyi, 1988). It assesses the activity (e.g., the main activity a person is doing), the context (e.g., place of the activity, companionship), aspects related to interest and motivation (i.e., reasons for engaging in the activity), and affective experiences (e.g., strong, happy). Moreover, as depicted in Figure 2.1, items that capture aspects of flow more closely were also included, and demands (here referred to as challenge) and skills are measured. To date, slightly different versions of the ESF exist (see Delle Fave, not at all somewhat quite very

| How well were you concentrating? | 1 2 3 4 5 6 7 8 9 |
| Was it hard to concentrate? | 1 2 3 4 5 6 7 8 9 |
| How self-conscious were you? | 1 2 3 4 5 6 7 8 9 |
| Did you feel good about yourself? | 1 2 3 4 5 6 7 8 9 |
| Were you in control of the situation? | 1 2 3 4 5 6 7 8 9 |

Indicate how you felt about your activity.

| low | high |
| Challenges of the activity | 1 2 3 4 5 6 7 8 9 |
| Your skills in the activity | 1 2 3 4 5 6 7 8 9 |

FIGURE 2.1 Flow-related items of an example of the ESF (adapted from Csikszentmihalyi & Csikszentmihalyi, 1988, pp. 257–258)
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Massimini, & Bassi, 2011). These versions also have different scale ranges, and researchers have to adjust for this if they want to compare the results of studies that use different forms of the ESF.

Asking individuals about concentration, self-consciousness, and the feeling of control assesses three components of flow. Moreover, feeling good captures the autotelic nature of flow. Although the ESF taps some aspects of flow, the decision of whether a person experiences flow is based solely on the match between challenge and skills (Csikszentmihalyi & Csikszentmihalyi, 1988). To establish this match, for example, Csikszentmihalyi and LeFevre (1989) transformed a person’s responses to individual z-scores. When the reported challenges and skills were greater than the respondent’s average they were classified as being in the flow context. This kind of measure of flow is predominantly found in ESM studies. But not only ESM studies rely on measuring flow with the match of demands and skills. For example, a recent experimental study by Ulrich, Keller, Hoenig, Waller, and Grön (2013) also assumed that flow is experienced when demands and skills match.

To date, numerous studies provided rich data that support the flow models (e.g., Aellig, 2004; Bassi & Delle Fave, 2012; Csikszentmihalyi & Larson, 1987; Csikszentmihalyi & LeFevre, 1989; Delle Fave & Massimini, 2005; Fullagar & Kelloway, 2009; Massimini et al., 1987; Rheinberg, Manig, Kliegl, Engeser, & Vollmeyer, 2007; Schallberger & Pfister, 2001). The match of demands and skills is associated with distinct changes in the components of flow (measured with the ESF), and other aspects that are additionally assessed with the ESF. Therefore, the balance – as proposed by the models – is highly relevant for subjective experiences.

Besides this main finding, other propositions of the models were not supported by empirical data. Further, as demands and skills do not entirely determine the experience of flow, researchers do not know if individuals indeed experience flow when both challenges and skills match (at a high level). For example, when according to the flow models individuals were expected to experience boredom, they repeatedly reported experiences that were associated with positive feelings and with qualities related to flow. Moreover, the reliance on only two items in order to assess the balance is psychometrically problematic, and the calculation of a match is not easy to handle (cf. Moneta, 2012). Furthermore, with the ESF, participants rate the challenge of a task instead of the demands as it was originally intended by Csikszentmihalyi (1975). This is misleading because challenge already implies a subjective assessment on the basis of the skills. Thus, a challenge would be a task in which the demands match or exceed the skills. These critical points are discussed in depth elsewhere (e.g., Delle Fave et al., 2011; Ellis, Voelkl, & Morris, 1994; Engeser & Baumann, 2016; Keller & Landhäusser, 2012; Moneta, 2012; Rheinberg & Engeser, in press).

**Strength:** The demand-skill balance is an important dimension with strong relations to various kinds of subjective experiences that are especially relevant in the work context, too. Measuring this balance provides simple but highly relevant information. Assessing the two dimensions allows researchers to relate their results to the rich body of existing results as most of the studies in the tradition of Csikszentmihalyi used this approach.
Weakness: The demands and skills do not entirely determine the experience of flow. Thus, relying on the demand-skill balance to measure flow is problematic. Moreover, the reliance on two items in order to assess the balance is psychometrically problematic and asking for challenges (instead of demands) could be misleading.

2.2.2 Questionnaire assessing selected and/or additional components of flow

The measures presented in this section rest on assessing some components of flow via items in a questionnaire. An argument for this approach is that some components may be the core of flow and measuring other components would make the assessment less valid. A related argument is to keep the questionnaire short. Assessing only some components is also sometimes justified by the finding that the components of flow are highly correlated (see Section 2.2.3’s questionnaires assessing most/all components of flow). However, these questionnaires have the inherent risk of missing important aspects of flow and thus capturing something else.

Other measurement approaches assess aspects of flow that are not directly represented by the components of flow. These aspects are included in the questionnaires in order to distinguish between the components and consequences of flow. For example, one aspect that is commonly included in the assessment of flow is happiness. Flow is an autotelic experience. It is a task-intrinsic incentive (Rheinberg & Engeser, in press), and individuals do activities in order to enter the flow state. However, flow is not the same as happiness. Csikszentmihalyi himself stated, “when we are in flow, we are not happy . . . if a rock climber takes time out to feel happy while negotiating a difficult move, he might fall to the bottom of the mountain” (1997, p. 32). Flow itself is not defined through an affective state (see components of flow listed in Section 1). Empirical data confirm that flow and happiness are not necessarily experienced at the same time (Engeser & Baumann, 2016; see also Fullagar & Kelloway, 2009). Aellig (2004; cf. Rheinberg & Engeser, in press) showed that flow experience while climbing goes along with the feeling of happiness afterwards. Hence, experiencing more flow should go along with a happier life in general (cf. Csikszentmihalyi, 1997; Fullagar & Kelloway, 2009). Furthermore, Schallberger and Pfister (2001) found a strong association of flow with the state of high activation (i.e., arousal) rather than with emotions of happiness (cf. Engeser & Baumann, 2014; Rogatko, 2009). Silvia (2008) found similar results and proposed a close link between the curious emotion of interest and the concept of flow.

An example of a questionnaire that includes happiness is the WOrk-reLated Flow inventory (WOLF; Bakker, 2008). As the name indicates, the questionnaire has been designed to assess flow in the work context and it measures absorption, work enjoyment, and intrinsic work motivation with several items (Figure 2.2). The items that assess absorption may be best understood as a measure of merging of action and awareness and a loss of reflective self-consciousness. Other components, such as clear goals and the experience of noncontradictory demands, are not
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Work enjoyment assesses the experience of the affective quality of work (including happiness), which, as we have argued, is not strictly a component of flow. Finally, intrinsic work motivation reflects the autotelic part of flow. Irrespectively of whether enjoyment should be included in a measure of flow, enjoyment as well as intrinsic motivation are represented more strongly in the WOLF than would have been expected on the basis of the flow components. The original WOLF started to ask individuals to evaluate their experience of work in a summative way on a general level. Individuals were thinking about their general work experience when answering the items (Bakker, 2005, 2008). This can be problematic because for the individual answering the questionnaire the experience of flow and the experiences after flow (consequences – e.g., happiness) cannot easily be separated (see also Fullagar & Kelloway, 2009, for a similar argument). Take for example that when answering the item “My work gives me a good feeling” it may be unclear for the respondent whether this is a feeling that appears after work or whether it means that someone generally feels good while working. Other items of the original WOLF refer more clearly to an activity itself (e.g., “When I am working, I forget everything else around me.”). Later, the items have been modified such that they refer to a corresponding day and thus could be used, for example, in diary studies (e.g., Demerouti, Bakker, Sonnentag, & Fullagar, 2012).

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**FIGURE 2.2** The WOrk-reLated Flow inventory (WOLF; adapted from Bakker, 2008; 1 = never, 2 = almost never, 3 = sometimes, 4 = regularly, 5 = often, 6 = very often 7 = always)

<table>
<thead>
<tr>
<th>Question</th>
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<tbody>
<tr>
<td>Absorption</td>
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<td>When I am working, I think about nothing else.</td>
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<td>I get carried away by my work.</td>
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<td>When I am working, I forget everything else around me.</td>
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<td>I am totally immersed in my work.</td>
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<td>My work gives me a good feeling.</td>
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<td>I do my work with a lot of enjoyment.</td>
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<td>I feel happy during my work.</td>
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<td>I feel cheerful when I am working.</td>
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<td>I would still do this work, even if I received less pay.</td>
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<td>I find that I also want to work in my free time.</td>
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<td>I work because I enjoy it.</td>
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<tr>
<td>When I am working on something, I am doing it for myself.</td>
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<tr>
<td>I get my motivation from the work itself, and not from the reward for it.</td>
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Please indicate how often you experienced each of the statements.
Assessing flow in a summative way relates to the discussion of assessing flow on a trait level. Here, trait means not the readiness to respond in a certain way but how often flow is experienced in a certain domain; people who experience higher frequencies of flow are expected to have a disposition for experiencing flow (e.g., Jackson, Martin, & Eklund, 2008). Assessing flow on such a general or trait level instead of the state level has the same drawback as interviews: participants are asked to report about their flow retrospectively and this could result in some recall bias. The research of Fulkagar and Kelloway (2009) suggests that flow is predominantly a state that varies across time and situations rather than a trait. Therefore, it results from an interaction between incentives in the environment and personal dispositions, such as implicit and explicit motives (cf. Schiepe-Tiska & Engeser, 2012) that may also more closely capture what Csikszentmihalyi (1975) referred to as an autotelic personality (see also Baumann, 2012).

Another example of assessing flow with selected components is the questionnaire used by Keller and Bless (2008). The questionnaire measures the perceived control over an outcome, involvement, and enjoyment. Perceived control is assessed with items such as “I had the necessary skill to play the game successfully,” “I knew exactly what I had to do,” and “I think I performed well in the game.” The first two items represent components of flow, but the last item is more an evaluation of performance rather than the experience of the activity itself. Involvement and enjoyment are measured with items such as “I was strongly involved in what was happening in the game,” “I was thrilled,” and “I would consider buying the game for private use.” Involvement represents flow while doing the activity, but buying the game may have different reasons besides the experience of the activity itself.

Further examples for selective inclusions of components in a flow measure could be added (e.g., Schiefele & Raabe, 2011; Ulrich et al., 2013). However, regardless of whether readers share the merits and problems we have implied here when assessing flow with only some and/or additional components, the aim was to provide some basic orientations that enable them to evaluate flow questionnaires by themselves.

**Strength:** Questionnaires concentrate on selected aspects of flow. This allows for more tailored or shorter measures, especially for researchers interested in these specific aspects. If some components of flow are considered as more central than others, assessing these components exclusively would warrant higher validity (because less central aspects do not affect the scores).

**Weakness:** The main risk is that the measure of flow does not fully represent the experience of flow. Moreover, selected components may dominate the assessment of flow. If additional components are incorporated, the concept of flow is extended beyond its original understanding.

### 2.2.3 Questionnaires assessing most/all components of flow

The final approach to the assessment of flow tries to capture all components. An example is the Swedish Flow Proneness Questionnaire (SFPQ; Ullén et al., 2012). This questionnaire assesses the subjective sense of concentration, challenge-skill
balance, explicit goals, clear feedback, sense of control, lack of a sense of boredom, and enjoyment. Although most components presented earlier are included, the merging of action and awareness and the loss of reflective self-consciousness are missing. As the name already implies, the questionnaire measures flow in a summative way with regard to household maintenance, work, and leisure activities (see Figure 2.3 for questions with regard to work activities).

When looking at the items, two critical aspects need to be noted. First, the absence of boredom does not necessarily imply that individuals experience flow; respondents could also be stressed all the time when being at work. Second, having a clear picture of what to achieve and how to achieve it could mean that the individual is permanently reflecting on his/her behavior which is incompatible with the component of loss of reflective self-consciousness. A similar point could be made for the monitoring of performance. In addition, the questionnaire tries to assess flow in a summative way (cf. Section 2.2.2).

When questionnaires try to assess all components of flow, they also test whether the components reflect one or several dimensions that underlie the flow concept. The most comprehensive work to examine whether flow is a single or a multifaceted experience has been done by Jackson and colleagues (Jackson & Eklund, 2002; Jackson & Marsh, 1996), who developed a questionnaire that was theoretically grounded in the multifaceted concept of flow. They started with developing a measure of flow state and later they measured flow as a trait as well. The Flow State Scale (as well as the Flow Trait Scale) assesses all components by separating the component of coherent, noncontradictory demands and feedback into two components, and additionally including the demand-skill balance and transformation of

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>. . . you feel bored?</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>. . . it feels as if your ability to perform what you do completely matches how difficult it is?</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>. . . you have a clear picture of what you want to achieve, and what you need to do to get there?</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>. . . you are conscious of how well or poorly you perform what you are doing?</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>. . . you feel completely concentrated?</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>. . . you have a sense of complete control?</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>. . . what you do feels extremely enjoyable to do?</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

**FIGURE 2.3** Swedish Flow Proneness Questionnaire for flow at work (SFPQ; adapted from Ullén et al., 2012; 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = every day or almost every day)
Measuring flow at work

Each component is measured with four items, or in the short version (Jackson et al., 2008; see Figure 2.4) with one item per component. The scale was developed and used mainly in sports contexts (Swann, Keegan, Piggott, & Crust, 2012), but could also be used in work (or other) contexts – as has been done by Fullagar and Kelloway (2009).

Jackson and colleagues tested two statistical models of the flow concept and compared them with each other – a first-order model with nine correlated factors representing flow as a single construct and a nine-factor model with correlated factors representing flow as a multifaceted construct (Jackson & Marsh, 1996; Marsh & Jackson, 1999; Martin & Jackson, 2008). The results showed that both models had a good statistical fit. However, the nine-factor model fitted the data even better than the one-factor model. Beard, Hoy, and Woolfolk Hoy (2010) also replicated this structure with a sample of elementary teachers. Therefore, from a conceptual view corroborated by factor analyses, flow can be seen as a multifaceted experience (see also Section 1, about the flow state and its components). Hence, focusing on one or some components misses important aspects of flow experience.

The Flow Short Scale developed by Rheinberg, Vollmeyer, and Engeser (2003) is another example of a questionnaire that includes all components of flow. The scale has been used in various contexts (e.g., Baumann & Scheffer, 2011; Engeser & Baumann, 2014; Engeser & Rheinberg, 2008; Reinhardt, Lau, Hottenrott, & Stoll, 2006; Schüler, Brandstätter, & Sheldon, 2013) and in ESM studies as well (Rheinberg et al., 2007). As depicted in Figure 2.5, the scale consists of ten items. In addition, demands, skills, and the perceived fit of demands and skills can be assessed separately. The scale shows high internal consistency, warranted to sum up the items to obtain a measure of flow. Nevertheless, factor analyses revealed that two factors could be separated (Rheinberg et al., 2003): fluency of performance (items 2, 4, 5, 7, 8, 9)

<table>
<thead>
<tr>
<th>Component</th>
<th>Example Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demands-Skill Balance</td>
<td>I feel I am competent enough to meet the high demands of the situation.</td>
</tr>
<tr>
<td>Action-Awareness Merging</td>
<td>I do things spontaneously and automatically without having to think.</td>
</tr>
<tr>
<td>Concentration</td>
<td>I am completely focused on the task at hand.</td>
</tr>
<tr>
<td>Loss of Self-Consciousness</td>
<td>I am not worried about what others may be thinking of me.</td>
</tr>
<tr>
<td>Sense of Control</td>
<td>I have a feeling of total control over what I am doing.</td>
</tr>
<tr>
<td>Clear Goals</td>
<td>I have a strong sense of what I want to do.</td>
</tr>
<tr>
<td>Unambiguous Feedback</td>
<td>I have a good idea while I am performing about how well I am doing.</td>
</tr>
<tr>
<td>Transformation of Time</td>
<td>The way time passes seems to be different from normal.</td>
</tr>
<tr>
<td>Autotelic Experience</td>
<td>The experience is extremely rewarding.</td>
</tr>
</tbody>
</table>

FIGURE 2.4 Components and example items of the Flow State Scale (adapted from Jackson et al., 2008)
Anja Schiepe-Tiska and Stefan Engeser

and absorption by the activity (items 1, 3, 6, 10). If individuals score high on both aspects, they are considered to experience flow (cf. Engeser, 2012a). An advantage of this measure is its brevity. However, the components of flow are assessed with only one or two items. In order to evaluate the structure of flow, more items would be needed, such as in the questionnaire of Jackson and colleagues presented earlier.

**Strength:** The questionnaires presented here incorporate all components of flow and thus represent the construct of flow as defined by Csikszentmihalyi (1975; Nakamura & Csikszentmihalyi, 2002). These questionnaires could be used in various contexts, including work. Moreover, the short questionnaires can be combined with the ESM in order to assess all components of flow.

**Weakness:** If some components of flow are considered more central than others, assessing all components reduces the validity of the measure. In addition, assessing all components with multiple items lengthens the measure, questioning the applicability for all research designs (e.g., for repeated assessments in ESM).

### 3 Nondeclarative methods to assess flow

With flow being a state of complete involvement in an activity, declarative measures always have the drawback that the experience of flow needs to be interrupted in order to assess flow. As a consequence, people enter a state of self-reflection...
and thus flow can be assessed only retrospectively. In contrast, with nondeclarative (i.e., procedural or autonomic) methods, flow can be assessed during an activity without interrupting it. However, because flow is a subjective experience, these methods should be combined with declarative measures of flow in order to validate the results.

Some first theoretical attempts addressing nondeclarative measures have discussed the role of the neurotransmitter dopamine as a correlate of flow (Marr, 2001) and a down-regulation of task-irrelevant processes that relate to the prefrontal activity in the brain (Dietrich, 2003, 2004; Goleman, 1997). Empirical studies have focused on neuronal (Klasen, Weber, Kircher, Mathiak, & Mathiak, 2012; Manzano et al., 2013; Ulrich et al., 2013) or psychophysiological measures, such as heart rate variability (HRV; Keller, Bless, Blomann, & Kleinböhl, 2011; Manzano, Theorell, Harmac, & Ullén, 2010; Peifer, Schulz, Schächinger, Baumann, & Antoni, 2014), facial electromyographic indicators (EMG; Kivistöngas, 2006; Manzano et al., 2010; Nacke & Lindley, 2009), electrodermal activity (Kivistöngas, 2006), and cortisol (Keller et al., 2011; Peifer, 2012; Peifer et al., 2014).

### 3.1 Neuronal indicators

Neuronal studies use positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) images in order to examine correlates of flow. Manzano et al. (2013) showed that the general proneness for flow at work, in leisure activities, and during household maintenance (assessed with the Swedish Flow Proneness Questionnaire; Ullén et al., 2012) is related to the number of dopamine D2-receptors in the dorsal striatum (i.e., putamen and caudate nucleus), with the highest correlation for flow at work. This result was also supported by Ulrich et al. (2013), who, on the one hand, experimentally induced flow by establishing a demands-skill balance, and on the other hand, correlated the fMRI images with three flow items assessing enjoyment and perceived challenges/skills balance. In the balance condition, the neural activation was increased, especially in the left putamen. The availability of dorsal striatal dopamine receptors was found to be associated with better impulse control (Dalley et al., 2007; Dalley, Mar, Economidou, & Robbins, 2008; Pine, Shiner, Seymour, & Dolan, 2010). Hence, people who are prone to flow in their daily lives may show better impulse control, which can help them structure a situation and direct their attention to a limited stimulus field. In line with this evidence, it has been proposed that the putamen modulates stimulus-action coding (Haruno & Kawato, 2006) as well as stimulus-response habit formation (Devan, Hong, & McDonald, 2011), and plays an important role in evaluating and guiding ongoing actions toward their expected outcomes and directions (Balleine, Delgado, & Hikosaka, 2007; Hori, Minamimoto, & Kimura, 2009). Therefore, it may display the process of choosing action opportunities (i.e., challenges) that match the perceived abilities in order to structure the activity in such a way that a person always knows what to
do next and gets absorbed in the activity (see Schiepe-Tiska & Engeser, 2012, for a more detailed description).

In addition to these results, Ulrich et al. (2013) found a decreased neural activation in the medial prefrontal cortex in the balance condition. A lesion of this section has been found to abolish self-referential processing (Philippi, Duff, Denburg, Tranel, & Rudrauf, 2012). Thus, this result suggests that being in flow goes along with a loss of reflective self-consciousness (see also Goldberg, 2001).

Moreover, when comparing the conditions as well as when correlating the fMRI data with the selected flow items, a decreased neural activation was observed in the left amygdala, a region that is important for emotional coding of environmental stimuli (cf. Gottfried, 2011). An increased activation in the amygdala signals the valence (i.e., pleasant and unpleasant) rather than the arousal of a stimuli, with the later even leading to a decreased activation in the left amygdala (Anders, Eippert, Weiskopf, & Veit, 2008). In line with this, Aellig (2004) showed in an ESM study that climbers who experienced flow reported arousal while they were climbing and positive valence after they were done climbing.

3.2 Psychophysiological measures

Also Peifer et al. (2014) also showed that high levels of flow were related to medium levels of arousal, as indicated by moderate sympathetic activation (i.e., low frequency component of heart rate variability – HRV) and high parasympathetic activation (i.e., high frequency component of HRV), the latter additionally indicating decreased cognitive workload (Bernardi et al., 2000). Moreover, high levels of flow are linked to moderately elevated cortisol levels (see also Peifer, 2012). Peifer et al. (2014) point out that cortisol has been found to facilitate focusing and sustaining attention (cf. Peifer, Schächinger, Engeser, & Antoni, 2015; see also Fehm-Wolfsdorf & Nagel, 1996; Fehm-Wolfsdorf et al., 1993) by providing additional energy resources (Benedict et al., 2009; Peters et al., 2004). In addition, cortisol is related to improved concentration (Born, Hitzler, Pietrowsky, Pauschinger, & Fehm, 1989), which is also a component of flow.

Strength: With nondeclarative measures, flow can be assessed online without interrupting the state. Moreover, micro processes of flow can be examined, such as length, intensity, and stability of flow with regard to promoting and hindering conditions (see also Peifer, 2012, for a similar argumentation). Data gathered with nondeclarative measures provide rich, informative, and objective data that complement the assessment of flow via self-report.

Weakness: Nondeclarative measures are time- and resource-consuming because usually expensive equipment and additional training of the staff are required. In addition, so far, some of the measures can primarily be used in laboratory settings and not in applied settings, such as workplaces. To date, the inconsistency of nondeclarative indicators prevents from obtaining an accurate assessment of the dynamic and subjective experience of flow.
4 Conclusion

Which measurement technique a researcher should use depends on the context and the research questions he or she wants to answer. We differentiated three main approaches: the interview technique, questionnaires (assessing one component, selected and/or additional components, most or all components), and nondeclarative measures (neuronal and psychophysiological measures). In addition, we listed what are, in our view, the strengths and weaknesses of each approach. This may help researchers to evaluate different measures of flow as well as to evaluate flow research in general. Moreover, it may facilitate the selection of the best possible measure of flow for one’s own empirical research.

In sum, interviews are best applied to new kinds of activities, to assess the unique subjective experience of individuals, and to discover potential new aspects of experiences (Rheinberg & Engeser, in press). Questionnaires allow us to assess specific aspects, and focus on a predefined concept of flow experience. This enables researchers to study individual differences quantitatively, and also the influence of the context (e.g., different kinds of activities) can be much more easily examined than with the qualitative approach of interviews. However, the key factor for applying questionnaires is that the items have to be selected carefully. We hope that we have emphasized how important this selection is and have helped practitioners and researchers to evaluate different flow questionnaires. We see the advantages of assessing all components of flow. In the case of adding components, researchers have to keep in mind that new components need to be carefully related to the flow concept and it should be stated explicitly whether these new components are part of the flow experience or more closely related preconditions or consequences of flow.

In addition, we hope that nondeclarative measures, such as neuronal or psychophysiological measures, can complement declarative measures in order to assess flow “live” during an activity and not only retrospectively or by interrupting this fruitful experience. However, when using these kinds of methods, researchers have to keep in mind that flow is a subjective state. To date, no nondeclarative measures exist that fully represent this subjective experience, and thus assessing flow on the sole basis of these measures would not be warranted. Therefore, participants still have to be asked whether they are in the flow state.

Our presentation does by no means exclude that new or other kinds of measures of flow could be used. Indeed, the Flow Questionnaire (Csikszentmihalyi & Csikszentmihalyi, 1988, pp. 194–195) is an early measure of flow that might inspire other kinds of approaches. Within the Flow Questionnaire, flow is described with three quotes and participants are then asked to indicate whether they have ever experienced such experiences. This item is used to distinguish between “flow-ers” and “non-flow-ers.” The flowers are then asked to evaluate their own experiences with rating scales (see also Delle Fave et al., 2011; Moneta, 2012). In our classification it represents a combination of a qualitative approach and questionnaires that
assess flow with a closed answering format. From our point of view, if possible, a combination of different measurement approaches may be the best way to capture flow in order to combine the strength of different measures and to explore new ways of assessing flow.

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Introduction

Already in 1975, Csikszentmihalyi defined flow as the “holistic sensation that people feel when they act with total involvement” (p. 4). As such, flow is a mental state that individuals may experience during any activity of their everyday life. Research on flow can be viewed as the landmark that urged scholars to shift their attention from the study of deficiencies to that of strengths and optimal experiences. This positive psychology movement has also affected organizational psychology researchers, who now recognize that a balanced approach that takes into account both employee weaknesses and optimal functioning can better explain the complexity of organizational phenomena. In this context, the study of flow at work has started gaining momentum (Fullagar & Kelloway, 2013).

The different conceptualizations of flow that were proposed over the years and across life domains converge on three core elements that define this optimal state: total absorption in the activity at hand (i.e., the sense that “time flies”), high levels of enjoyment (i.e., feelings of happiness), and enhanced intrinsic motivation (i.e., activities are partaken in irrespective of external rewards or costs; Bakker, 2008). A central assumption is that flow experiences happen suddenly, are of relatively limited duration, and exhibit significant variations within the same person (Csikszentmihalyi, 1993). This means that although employees may vary from one another in terms of how frequently they experience flow or how strong these experiences are, the very same employee may experience flow more frequently and/or more intensely in certain moments than in other moments (Xanthopoulou, Bakker, & Ilies, 2012a).

In this chapter, the focus is on the daily experiences of flow at work in an attempt to understand the within-person dynamics of the phenomenon, and to analyze the psychological processes that explain these within-employee variations. First,
the concept of flow at work is described with a special emphasis on its dynamic nature. Next, the theoretical importance of understanding within-person fluctuations in flow over and above between-person differences is analyzed. To this respect, a review of studies that investigate the predictors and outcomes of within-employee changes in flow is presented. Finally, the methodological challenges that scholars face when studying within-person fluctuations in work-related flow are outlined, different research protocols are considered, and their advantages and disadvantages are discussed.

The dynamic nature of flow at work

Flow is an optimal experience that individuals in general, and employees in particular, feel when engaging in activities that are intrinsically rewarding (Nakamura & Csikszentmihalyi, 2002). Flow is an enjoyable state that is more likely to take place when people are involved in challenging activities, while they possess the necessary skills to meet these challenges in order to reach well-defined goals (Csikszentmihalyi, 1990). In contrast, when there is a mismatch between challenges and skills, individuals are more likely to experience anxiety or boredom. Put differently, flow can be experienced during activities that are intrinsically rewarding, where perceived challenges and skills are above the person’s average and in balance, and where continuous feedback is provided on the process. According to Nakamura and Csikszentmihalyi, under these circumstances the optimal experience unfolds from moment to moment and has the following characteristics: a) people are so concentrated on the task that they forget everything else around them; b) they are in total control of their actions; c) they fail to keep track of time; and d) despite being functional, they lose their self-awareness as social actors.

Bakker (2005, 2008) defined flow at work as a peak experience that is characterized by intrinsic work motivation, total absorption in the task, and work enjoyment. Accordingly, employees reach flow when they are working on a task they find meaningful, when they are so absorbed in the task that they forget everything else around them, and when they are happy being busy with the task. For example, a history teacher is likely to be in flow when she is teaching about a topic she finds very interesting and when she is totally concentrated on this task and happy being in the class. When the bell rings and the class is over, the teacher will most likely exit the flow state since the conditions that allow the experience to take place are no longer present. The very same teacher may not experience flow when teaching about the same topic to another less receptive audience (e.g., noisy students who distract her attention) or when she is teaching about a topic she finds boring.

This example illustrates that flow is a dynamic phenomenon that depends on momentary, personal, and contextual stimuli (Csikszentmihalyi, 1990). Despite this assumption, work-related flow is often defined and measured as a rather enduring trait (e.g., Demerouti, 2006; Mills & Fullagar, 2008; Salanova, Bakker, & Llorens, 2006). Namely, employees are asked to report on their flow experience “in general” and not with respect to the moment that this experience occurs. These
between-person studies provide important insights on who is more likely to reach flow, but fail to explain why and how the very same employee may be in flow at a certain moment and not at another one. This research tradition initiated a dialogue about the essence of flow, and whether it is best operationalized as a dispositional trait that exhibits significant between-person variation or as a momentary state that depends on the situation and may vary significantly within the same person as a response to external stimuli (Fullagar & Kelloway, 2009).

In line with the trait approach, Csikszentmihalyi (1990) proposed that individuals who possess the characteristics of an autotelic personality (i.e., they engage in an activity for the intrinsic pleasure of it) have a greater predisposition to experience flow. For example, chefs may be asked to recall how frequently they experience flow when they are cooking. Those who are intrinsically motivated are more prone to reach the optimal experience. In support of the state approach, Kimiecik and Stein (1992) suggested that reaching the flow state depends not only on one’s dispositions but also on the specific characteristics of the situation (e.g., level of challenge during the task), as well as on how the person feels or acts with regard to the specific situation (e.g., level of concentration). Thus, the experience of flow highly depends on momentary conditions, and since these conditions are highly fluctuant even within the same person, flow should also be expected to exhibit significant within-person variations. Accordingly, a famous chef may experience flow when she is busy with preparing a new recipe, but she may not experience flow the next time she prepares this same recipe. Therefore, in order to be able to capture the experience as it unfolds and as it changes from one day or moment to the other within the same employee, flow should be evaluated frequently over short periods of time and with specific work-related activities as a point of reference (Alliger & Williams, 1993; Csikszentmihalyi & Hunter, 2003).

Jackson and Eklund (2002) clarified the nature of flow by proposing that it can be operationalized best as having both trait and state components. Accordingly, work-related flow is an optimal state that is influenced by momentary conditions during work, while employees may vary in the propensity to which they experience flow (see also Fullagar & Kelloway, 2009). Put differently, a part of the flow experience can be explained by dispositional elements, while another part can be explained by momentary, within-employee, situational, and personal states. This operationalization seems to better capture the theoretical assumptions that explain flow, since it incorporates both the role of the dispositional propensity to reach optimal experiences and the role of the characteristics of the activity that one is engaged in at a specific moment (Csikszentmihalyi, 1990; Nakamura & Csikszentmihalyi, 2002).

Findings of studies that examined both between- and within-person variations in flow at work support this complementary view, since significant amounts of variance were attributed to both levels of analysis. More specifically, the amount of variance that was attributed to between-person differences ranged from 14% to 63% (M = 37%) of the total variance in flow, while the amount of variance that was explained by within-person fluctuations ranged from 27% to 86% (M = 57%).
of the total variance across studies (Fullagar & Kelloway, 2009; Fullagar, Knight, & Sovern, 2013; Rodríguez-Sánchez, Schaufeli, Salanova, Cifre, & Sonnenschein, 2011; Xanthopoulou, 2011; Xanthopoulou, Bakker, Oerlemans, & Koszucka, 2012b). These results indicate that more than one-third of the total variance in work-related flow is attributable to within-person changes. This suggests that the state approach complements the trait approach, and thus it is imperative to understand the psychological processes that explain within-person changes in work-related flow in order to fully grasp these optimal experiences at work.

Although some studies indicated that flow exhibits stronger within-person variations during nonwork activities than during work-related activities (Navarro & Ceja, 2011), Rodríguez-Sánchez et al. (2011) showed that the absorption dimension of flow exhibited higher within-person variation when working versus when not working. Csikszentmihalyi and LeFevre (1989) in their study among white- and blue-collar workers concluded that employees are three times more likely to experience flow during work-related than during leisure activities, since work-related activities seem to be more challenging than nonwork activities. In a similar vein, Graham (2008) investigated twenty cohabiting couples who were followed up throughout the day for a week. Results showed that work-related activities were more likely to generate flow experiences, followed by household activities. Finally, Donner and Csikszentmihalyi (1992) found that on average 44% of time at work is time in flow. These results suggest that the work context does provide rich opportunities for flow experiences to take place, and thus it is important for theory development to examine within-person variability in work-related flow in more depth.

The theoretical importance of capturing within-person variations in flow at work

How does the study of within-person variations in work-related flow add to theory development? The main advantage of adopting a complementary trait-state approach in the study of work-related flow is that it offers the opportunity to observe the flow experience when and while it evolves, whether it is moments within workdays or workdays within weeks. Taking temporality into consideration permits capturing intra-individual variability in flow over and above between-person differences. This is important because it helps in documenting when an employee, who may or may not have the disposition to experience flow, reaches the flow state. In other words, state approaches allow estimating and explaining the within-person variance in flow that is considered to be random error in trait approaches (Ceja & Navarro, 2011, 2012).

On a related note, the study of within-person variations in work-related flow also helps in describing the phenomenon in a more systematic manner. Although flow has been initially depicted as a rather infrequent state that may occur only a few times during one’s lifetime (Csikszentmihalyi, 1975), within-person studies suggest that it is not as infrequent as it was initially thought to be, particularly in
the work context (Ceja & Navarro, 2011, 2012; Csikszentmihalyi & LeFevre, 1989; Rodríguez-Sánchez et al., 2011). The common characteristic of these within-person studies is that multiple measurements are taken over short periods of time. This allows capturing the flow experience the moment that it occurs or very close to its occurrence. When observations are in close proximity to the examined experience, assessments are likely to be relatively free from retrospective bias (Ohly, Sonnentag, Niessen, & Zapf, 2010), and thus the frequency of the phenomenon can be estimated more accurately. Let’s consider the following: if we ask employees to rate how frequently they experience flow during their work in general, it is likely that they may forget optimal experiences of very short duration. Such estimations may result in the inaccurate conclusion that flow is a rather uncommon work-related experience. In contrast, if flow is measured frequently and in relation to specific activities at work, the chance of missing important information is reduced. Thus, the initial impression that flow was rather infrequent could be attributed to misinterpretations that were based on findings from studies that treated flow as mainly a static phenomenon.

It is clear that the study of within-person variations in work-related flow adds to theory development because it provides more concrete conceptualizations of the construct. Another clear advantage of the situational, within-person approach over and above the between-person approach in the study of flow at work is that the former allows collecting rich information about the psychological processes that explain the optimal experience. Between-person studies yield information on the enduring predictors and outcomes of work-related flow. For instance, Csikszentmihalyi (1990) suggested that people who are intrinsically motivated are more likely to get into the flow state (see also Fullagar, Delle Fave, & Van Krevelen, this volume). However, this does not mean that an intrinsically motivated employee experiences flow all the time. In order to be able to understand when this person is most likely to enter into the flow state and why, it is important to study the momentary conditions that precede the optimal experience, as well as the consequent outcomes. Evidence on the most proximal causes and consequences of momentary work-related flow experiences may explain what it is that triggers the person to enter flow in specific moments and not in others. This information helps one to fully understand why people experience flow, because these proximal conditions are the ones that initiate the psychological processes that generate momentary experiences, over and above the related traits (Xanthopoulou et al., 2012a).

The study of within-person changes in work-related flow is important for theory development for one more reason. According to Chen, Bliese, and Mathieu (2005), theoretical assumptions that are based on empirical evidence from between-person studies should not be automatically applied at the within-person level of analysis. This is because the psychological processes that explain between-person variations in a phenomenon do not necessarily parallel the psychological mechanisms that explain within-person fluctuations in the same phenomenon. The reason is that between-person approaches do not account for the dynamic relationships that exist at the within-person level of analysis, and as a result they provide part of the
truth but not the whole truth. There are empirical findings supporting this view with respect to concepts that show significant within-person fluctuations just like flow. For example, there is some preliminary evidence showing that the relationship between job demands and work engagement (i.e., a motivational, work-related state that is characterized by high levels of energy, dedication, and absorption) is different when engagement is measured as a trait and when it is measured as a state (Xanthopoulou & Bakker, 2013). Namely, evidence suggests that this relationship is negative at the between-person but positive at the within-person level of analysis.

The foregoing suggests that the psychological mechanisms that explain dynamic phenomena may be different depending on the level of analysis and specificity. This underscores the necessity to cross-validate the theoretical assumptions across the different levels of analysis, in order to test for potential similarities or differences (Chen et al., 2005). Empirical evidence showing that the psychological processes explaining work-related flow are similar at the between- and within-person level favors the homology of the underlying theoretical assumptions, and supports their ecological validity across levels of analysis (Chen et al., 2005; Xanthopoulou et al., 2012a). Rejection of homology underscores the need for theory refinement in a way that the dissimilarities across levels are recognized and explained.

**Work-related flow, antecedents, and outcomes: Is there homology across levels?**

Empirical evidence concerning between-person differences in work-related flow provides important insights on who is more likely to reach optimal experiences at work, and which are the antecedents and outcomes of trait flow. Mills and Fullagar (2008) studied architecture students working on creative projects and found that those who were intrinsically oriented to seek out learning experiences were the most likely to be in flow. Furthermore, the combination of high levels of intrinsic motivation and high levels of need for autonomy increased the chance of experiencing flow significantly. In a similar vein, Demerouti (2006) found a positive relationship between employee conscientiousness and flow at work, while Salanova et al. (2006) outlined the positive association between self-efficacy and flow over time in a sample of Spanish teachers.

Eisenberger, Jones, Stinglhamber, Shanock, and Randall (2005) conducted two cross-sectional studies among employees from a large retailer in the United States in order to test the central assumption that flow is experienced when challenges and skills are both high. They found that the combination of high perceived skills and challenges at work relates to higher levels of flow, but only for achievement-oriented employees. Bakker (2005, 2008) conceptualized flow in the context of the job demands–resources model (Bakker & Demerouti, 2014). In his study among music teachers, Bakker (2005) showed that those who were working in resourceful environments were more likely to experience a balance between their skills and challenges, which in turn related to higher flow. In a similar vein, Demerouti (2006) showed that employees working in environments characterized by autonomy, skill
variety, task identity, task significance, and feedback were more likely to experience flow. Salanova et al. (2006), as well as Mäkikangas, Bakker, Aunola, and Demerouti (2010), further supported the significance of resourceful work environments for flow at work over time. Next, Bakker (2008) found that job demands related positively to the absorption dimension of work-related flow (since pressure may enhance concentration) and negatively to the enjoyment dimension of flow (since chronic exposure to demands may induce strain and low levels of pleasure). Finally, the positive link between flow and job performance has been supported systematically (Bakker, 2008; Demerouti, 2006; Demerouti, Xanthopoulou, Tsaousis, & Bakker, 2014; Eisenberger et al., 2005). This short review of studies at the between-person level of analysis indicates that employees who are more intrinsically motivated or have more challenging and resourceful jobs (i.e., jobs characterized by a balance between demands and resources) are more likely to experience flow. Furthermore, those who experience flow are better performers. Do these assumptions hold at the within-person level of analysis as well?

One of the very first studies that focused on within-employee changes in flow is that of Csikszentmihalyi and LeFevre (1989). These authors followed seventy-eight workers for a week and, by using the experience sampling method, collected about seven random reports from each participant throughout each of the days that the study took place. Their findings demonstrated that in conditions where both challenges and skills were greater than the respondents’ average, employees reported higher levels of potency, concentration, and creativity. Similarly, Quinn (2005) in his experience sampling study among 128 knowledge workers showed that in conditions where employees were experiencing a better balance between challenges and skills they were more likely to enter the flow state. The significant role of the skills-challenges balance for work-related flow at the within-person level of analysis gained further support in the study by Ceja and Navarro (2012). These authors followed up sixty employees from various occupations over twenty-one working days. Results based on more than 6,000 momentary reports showed that work-related flow is best described as a state that combines continuous and sudden changes. These changes are determined by momentary levels of skills and challenges that are responsible for when someone will enter the ‘flow zone’, and how strong this experience will be.

The findings of the diary study by Fullagar and Kelloway (2009) underscore the role of task characteristics for understanding within-person variations in flow. Forty architecture students were followed up over a fifteen-week semester, while they were busy with studio work. Results showed that when academic work was characterized by higher levels of skill variety and autonomy than the average, students were more likely to experience flow. As concerns the role of job demands, the results of a diary study on emotional labor among thirty-four Polish and sixteen Dutch workers (Xanthopoulou et al., 2012b) showed that the emotion regulation strategies that employees use daily in order to deal with the emotionally demanding conditions at work explain within-person fluctuations in flow. On the days emotion workers were using surface acting (i.e., they were expressing the emotions that were
required by the organization without altering their inner feelings) more frequently than usual, they experienced lower levels of flow. In contrast, on days emotion workers were using deep acting (i.e., they were actively attempting to feel the required emotions) more frequently, they experienced higher levels of flow. Furthermore, the results of a diary study among forty-five Dutch primary school teachers indicated that time-management (as a dispositional trait) functions as a moderator on the relationship between daily workload and daily flow (Xanthopoulou, 2011). Daily workload related positively to daily flow only for those employees who were able to manage their time effectively, since these employees were less likely to be distracted due to their disorganized behavior.

The studies that focused on within-person fluctuations in the optimal experience showed that being in flow is beneficial for both employees and organizations. For instance, Fullagar and Kelloway (2009) found within-person fluctuations in flow to predict positive mood. Demerouti, Bakker, Sonnentag, and Fullagar (2012) in their four-day study among eighty-three German and Dutch employees found that certain dimensions of flow at work (mainly absorption and enjoyment) related positively to energy both at the end of the workday and at the end of the evening. Also, it was shown that daily recovery during work and detachment after work moderated the relationship between flow at work and energy after work. Namely, flow facilitated energy particularly for those who were less able to recover during work breaks, and those who were more likely to detach from work-related demands after work. In a similar vein, Xanthopoulou et al. (2012b) showed that on days that employees experienced higher levels of flow, they also reported a less intense need to recover from work-related demands at the end of the workday and, consequently, they recovered from work during leisure time. Finally, Dutch teachers who could deal effectively with their daily workload by managing their time well reported more frequent states of flow that – due to their resourcefulness – decreased their need for recovery after work and increased their feelings of relaxation before going to bed (Xanthopoulou, 2011).

Considering that daily recovery from work is a positive predictor of subsequent job performance (Volman, Bakker, & Xanthopoulou, 2013), the empirical findings on the positive link between momentary flow and recovery imply that flow may be beneficial for employee performance at the within-person level of analysis as well. However, there is very limited evidence on the flow-performance relationship. Bakker, Oerlemans, Demerouti, Slot, and Ali (2011) conducted a study among professional soccer players during specific matches. Results showed that in matches that players received higher levels of performance feedback and support from their coaches (i.e., more resources), they experienced higher levels of flow during the game. In turn, flow during the game related positively to both self- and coach-ratings of performance.

The aforementioned studies suggest that the psychological mechanisms that explain the relationships of work-related flow with its antecedents and outcomes seem to be quite homologous across levels of analysis. For instance, the balanced combination of skills and challenges is a crucial trigger of work-related flow both
between (Eisenberger et al., 2005) and within employees (Ceja & Navarro, 2012). Furthermore, findings concerning both levels of analysis underscore the role of job demands and resources for flow (Bakker, 2005, 2008; Demerouti et al., 2012), and agree that employees are likely to experience flow at work when they possess the resources that help them to deal effectively with the demanding aspect of challenges. Finally, and despite the limited empirical evidence, findings both at the between- and the within-person levels of analysis do support the beneficial effects of flow for employee well-being and job performance. All in all, the existing empirical evidence seems to favor the homology of the theoretical assumptions that explain flow across levels of analysis. However, the reported studies have one important limitation, since none of these really cross-validates the relationships between flow, its antecedents and outcomes at the between- and within-person levels of analysis simultaneously. Therefore, research is needed in order to reach more robust conclusions regarding the psychological mechanisms that explain within-person fluctuations in flow at work and their external validity across levels of analysis. In this respect, methods that allow capturing both between- and within-person variations in flow, its causes and consequences (e.g., experience sampling), and under which circumstances flow experiences are more likely to occur are of great significance for theory development.

Methods to capture within-person changes in flow

Flow is best operationalized as having both trait and state components. Thus, it can be measured as either an enduring disposition or as a fluctuant state (or both), depending on the research question of interest (Fullagar & Kelloway, 2009; Jackson & Eklund, 2002). In the case where one is interested in explaining between-person differences, flow can be measured as an enduring trait, while if one is interested in explaining within-person changes he or she should (also) measure momentary flow (Allen & Potkay, 1981). Cross-sectional studies or longitudinal studies with long time intervals allow capturing between-employee variations in flow. However, such designs are of limited use when one is interested in studying flow as a dynamic phenomenon that may change substantially within the same person from one moment or day to another. The reason is that one-time measurements or multiple measurements over long periods of time cannot capture the essence of flow and its dependence on momentary individual or situational stimuli. To understand within-person fluctuations in flow at work, complex study designs that track the same employees in multiple moments over short periods of time are needed (Graber, Laurenceau, & Carver, 2011).

Indeed, most studies that concern within-person changes in work-related flow have applied diary designs (e.g., Demerouti et al., 2012) or experience sampling methods (e.g., Ceja & Navarro, 2012; Csikszentmihalyi & LeFevre, 1989; Rodríguez-Sánchez et al., 2011). This is not surprising given the fact that such methods allow following up the same employees on a daily basis, and even several times during a day, across a short period of time (one or two weeks), while
participants act in their natural settings (e.g., work; Ohly et al., 2010). The main difference between diaries and experience sampling is that in the first case participants are asked to respond to different sets of questions at the different measurements throughout a day (e.g., skills and challenges at the beginning of the workday and flow in the afternoon), and repeat the same questions over several days. In contrast, experience sampling studies usually rely on more frequent and similar assessments over the course of a day (Binnewies & Sonnentag, 2013). Nevertheless, both types of studies have many things in common that allow stating that diaries are a specific form of experience sampling. In what follows, the experience sampling methodology is described in more detail and its advantages and disadvantages for the study of work-related flow are discussed.

**Experience sampling**

The significance of the experience sampling method (ESM) for capturing flow is evident when considering that this method was actually developed by Csikszentmihalyi, Larson, and Prescott (1977; see also Larson & Csikszentmihalyi, 1983) for the exact purpose of capturing flow experiences. ESM relies on participants’ responses to repeated signals (sent through personal digital assistants, blackberries, or smartphones) over short periods of time, while engaging in activities in their natural setting (e.g., work; Csikszentmihalyi et al., 1977; Oerlemans & Bakker, 2013). For instance, in experience sampling studies employees are prompted to provide reports on their momentary work-related flow levels with items such as “Right now, I am totally absorbed in the task I perform,” as well as on related experiential states and contextual characteristics at fixed, random, or a combination of fixed and random intervals during their workday for a period of one to several weeks (for examples, see Ceja & Navarro, 2011, 2012).

Depending on the research question under study, different experience sampling protocols may be adopted (Conner & Lehman, 2012). For instance, if researchers are interested in measuring flow experiences at specific moments during a day, they may choose time-based protocols. In time-based protocols, measurements are taken either at standardized times (interval-contingent; e.g., hourly reports or before lunch and at the end of the workday) or at random times, when a signal is delivered (signal-contingent; e.g., randomly between five and ten times per day). For example, Csikszentmihalyi and LeFevre (1989) asked participants to rate their flow experiences as response to seven daily signals or “beeps” coming from electronic paging devices that were sent randomly within two-hour periods. In a similar vein, Ceja and Navarro (2012) asked participants to carry a personal digital assistant for twenty-one consecutive workdays during working hours that were programmed to beep randomly six times per workday, with intervals of at least eighty minutes in between beeps. If one is interested in measuring flow with regard to specific events that occur at work (e.g., when interacting with clients or working together with colleagues on projects) then event-based protocols are more suitable. Of course, different types of protocols can be combined if, for instance, one wants to capture
work-related flow at random moments during a workday, as well as at predetermined instances (e.g., at the end of the workday), or wants to investigate how random flow experiences during the day link to performance and fatigue at the end of work.

ESM has clear methodological advantages for the study of work-related flow (Fullagar & Kelloway, 2013), with the first being that it allows estimating both between- and within-employee changes in optimal experiences simultaneously (Csikszentmihalyi & Hunter, 2003). Multiple measurements per employee throughout a day and over short periods of time allow investigating how flow experiences change within the same person from one moment to another, as well as from one employee to another. This makes it possible to decompose the between- and within-person variance in flow, and to test both momentary factors that explain within-person variance, as well as dispositional factors that explain between-person variance. In this way, ESM provides the chance to empirically capture the complementary trait-state view in the study of dynamic flow experiences. Importantly, ESM provides more accurate estimates of trait work-related flow than one-time measurements since momentary experiences may be averaged across measurement occasions (Dimotakis & Ilies, 2013).

Of similar importance, ESM allows capturing the flow experience at the moment that it occurs, as it evolves, and in the context that it evolves, adding to the ecological validity of the observations, while minimizing recall biases. Additionally, experience sampling studies with multiple measurements during the course of a workday and for a number of consecutive days allow researchers to get a more accurate picture of the proximal causes and consequences of the optimal experience, and develop a greater understanding of the dynamic psychological processes that explain flow at work. Furthermore, multiple measurements over short periods of time reduce the chance of missing the flow experiences when these occur (Kimiecik & Stein, 1992). Another advantage of experience sampling is that the duration of the flow experience can be studied in more detail. Finally, having multiple measurements over the course of a day enables researchers to also estimate causal effects. Namely, it allows investigating whether certain flow episodes during work may impact experiences later in the day. For instance, preliminary multilevel analyses from a diary study among thirty Greek employees that were followed up for five consecutive workdays, twice per day (i.e., right after work and at bedtime), indicated that on days that employees experienced flow at work they were more likely to experience flow during their leisure activities, because flow at work related negatively to cognitive weariness at the end of the shift (Xanthopoulou, 2013).

Despite these positive features, experience sampling is not a panacea and has its own methodological trade-offs (Bolger, Davis, & Rafaeli, 2003). Utilizing a research design that encompasses multiple measurements throughout a day over a substantial number of days carries the risk of exhausting the study participants. ESM is labor-intensive and can even annoy participants who are already busy with their normal workloads. As a result, participants may exhibit low commitment to the
study protocol that may, consequently, lead to missing observations, low-quality data, and high turnover percentages. Furthermore, interrupting (by beeping or sending a push message on the smartphone) an employee in the activity that (s)he is pursuing in order to fill out a short questionnaire is likely to interfere with his/her work tasks or to disrupt the flow experience itself. In other words, ESM may destroy the experience that it is designed to measure.

These issues can be solved by using interval-contingent protocols, where employees are asked to estimate the degree to which they experience(d) flow on specific, predetermined moments during the workday with items like “This morning/evening at work, I was totally absorbed in my task” (for an example see Demerouti et al., 2012). The most important advantage of this type of protocol is that it is less intrusive and limits the likelihood of disrupting flow as it evolves, since employees are usually required to report on their experiences just after finishing work or during predetermined work breaks (e.g., lunch break). Furthermore, this type of protocol is considerably less labor-intensive because participants have to respond only to a short questionnaire once or twice during the course of each workday that the study takes place (Oerlemans & Bakker, 2013). However, an important disadvantage of the interval-contingent protocols is their sensitivity to recall bias that may alter the true nature of the experience (Bolger et al., 2003). This disadvantage could be partly solved if researchers design interval-contingent protocols with more than one measurement during the day. For instance, employees could be asked to rate their flow experiences at midday (before going to lunch) and at the end of the day (before leaving the workplace).

**Alternative methods**

ESM has certainly many advantages, but also certain disadvantages when studying flow at work. The main problem with time-based protocols is that flow experiences may be lost (i.e., in interval-contingent protocols) or interrupted (i.e., in signal-contingent protocols). As concerns event-based protocols, the main drawback is that employees may be unable to comply with the protocol and report on their flow experiences after the specific event ends or they may even be unable to recognize the event of interest. In this respect, the day reconstruction method (DRM; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004) may be a good alternative to study work-related flow (Diener & Tay, 2014). In the DRM, individuals are asked to reconstruct in chronological order all episodes of their day. Episodes are defined by start and end time, area of life (e.g., work), and specific interactions that occurred (e.g., interactions with clients or colleagues). After reconstructing all episodes of a particular day, participants are required to rate how they felt with regard to each episode (e.g., whether they were in flow). In this way, it is unlikely to miss an important flow episode. However, retrospection bias may impact the description of the experience. There is no published study where the DRM has been applied in order to study within-employee fluctuations in flow at work. Thus, it would be
interesting for future studies to test whether the DRM is as useful as the ESM in capturing this optimal experience.

Despite the fact that initial research on flow was based on qualitative methodologies – and particularly interviews – that contributed significantly in defining the concept of flow in general (e.g., Csikszentmihalyi, 1975) and with regard to work in particular (Delle Fave & Massimini, 1988), the vast majority of studies on work-related flow are of quantitative nature (Fullagar & Kelloway, 2013). Despite the retrospective character of qualitative methods, asking employees to describe how they feel and behave when reaching a flow state may prove to be useful in better describing what it means to be in flow at work. Such qualitative evidence may also help in distinguishing flow from other related work-related constructs (e.g., state work engagement) in a more systematic way.

General conclusion

With this chapter, the main aim was to designate the theoretical significance of studying flow at work as a dynamic phenomenon that may vary within the same employee from one moment to the other. Special emphasis was placed on the methods that can be employed in order to capture within-person changes in work-related flow. The study of work-related flow as a dynamic phenomenon contributes to theory development in a number of ways, with the most important being the analysis of the psychological processes that explain the proximal causes and consequences of flow episodes. In this context, future studies should further investigate within-person variations in the antecedents and outcomes of flow in an attempt to test the homology of the flow theory across levels of analysis. Methodological and statistical advancements facilitate the management of complicated data sets, allowing researchers to capture within-employee changes in flow in a more elaborate way (Dimotakis & Ilies, 2013; Oerlemans & Bakker, 2013). Scholars should further consider using hybrid methods (e.g., a combination of experience sampling, observations, and/or interviews). Despite the difficulty of the endeavor, methodological triangulation would allow collecting even richer information that would add to the systematic analysis of within-person variations in work-related flow. Despite the fact that more work still needs to be done in establishing the relationships that explain the antecedents and consequences of flow at work across levels of analysis, this chapter suggests that such research is worth pursuing for the advancement of the field of positive organizational behavior.

References


WHAT PREDICTS FLOW AT WORK?

Theoretical and empirical perspectives

Evangelia Demerouti and Anne Mäkikangas

The construct of “flow” evolved out of the work of Csikszentmihalyi (1975) in which he investigated why artists, chess players, dancers, rock climbers, surgeons, and many others spend an inordinate amount of time engaged in activities for which there was no extrinsic reward. He concluded that it must be the enjoyment inherent in the task that was intrinsically motivating the artist to engage in a creative process that had no financial benefit and little social recognition (Csikszentmihalyi, 1975). The finding that individuals may perform activities purely for intrinsic reasons was contradictory to the prevailing psychological paradigm — that behavior could be explained only in terms of extrinsic rewards (Csikszentmihalyi, 1975). He defined this state as “the holistic sensation that people feel when they act with total involvement” (1975, p. 36). The term “flow” arose from the fact that many of the people that were interviewed described the state as flowing from moment to moment. Csikszentmihalyi (1975) described this state as autotelic, from the Greek words “auto,” meaning self, and “telos,” meaning goal.

Most of the research on flow has focused on voluntary leisure and sporting activities. However, research has also shown that the experience of flow occurs in work-related activities (e.g., Csikszentmihalyi, 1975; Csikszentmihalyi & LeFevre, 1989; Delle Fave, Massimini, & Bassi, 2011; Demerouti, 2006; Fullagar & Kelloway, 2009; Nielsen & Cleal, 2010). The subjective experience seems to be consistent across work and play, indicating that it is the quality of the experience that is important and not the nature of the activity (Csikszentmihalyi, 1988). In this chapter we will focus on the experience of flow at work. Specifically, we will (a) exemplify the nature of the subjective experience of work-related flow, (b) present theoretical frameworks that have been used or could be used to explain flow and conclude with some propositions, which are summarized in Figure 4.1, and (c) review the literature on the predictors of flow.
Defining flow at work

Csikszentmihalyi (1990) has defined flow as a state in which people are so deeply involved in an activity that nothing else seems to matter. Both qualitative and quantitative research on flow across a diversity of work and leisure activities has indicated that optimal experience consists of six core components (Csikszentmihalyi, 1990, 1993; Jackson, 1996; Jackson & Marsh, 1996; Nakamura & Csikszentmihalyi, 2002). These are (a) action-awareness merging in that involvement in the activity becomes spontaneous or automatic; (b) an intense and complete concentration on the task at hand; (c) a sense of control over what one is doing; (d) a loss of self-consciousness or a lack of concern for or about oneself; (e) a transformation of one’s perception of time passing; and (f) a sense of enjoyment in the intrinsic motivation of the activity. In addition to these, three supplemental components of flow have been identified, including (g) balance between the challenge of the activity and the skills necessary to perform the activity, (h) clarity of goals inherent in the task, and (i) feedback that the task provides that enables monitoring of one’s actions. However, these three additional components represent preconditions rather than subjective experience of flow (Csikszentmihalyi & Nakamura, 2010; Nakamura & Csikszentmihalyi, 2002, 2009), and therefore they will be elaborated later on.

In the work context, Bakker (2005, 2008) has operationalized the flow experience with three dimensions: absorption, enjoyment, and intrinsic motivation.
Absorption refers to total concentration and immersion in the activity. Enjoyment means that employees feel happy and make a very positive judgment about the quality of their working life (cf. Veenhoven, 1984). Intrinsic motivation refers to the state in which people do what they do “even at great cost, for the sheer sake of doing it” (Csikszentmihalyi, 1990, p. 3). Drawing on this operationalization of flow at work, Bakker (2005, 2008) developed the WORk-reLated Flow inventory (WOLF).

Work-related flow, particularly as operationalized by the WOLF, has many conceptual similarities with the concept of work engagement (Schaufeli, Bakker, & Salanova, 2006; Schaufeli, Salanova, Gonzalez-Romá, & Bakker, 2002). Work engagement is defined as “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (Schaufeli et al., 2002, p. 74). However, whereas work engagement represents relatively stable involvement in the wide variety of activities that constitute one’s job, flow is an intense, transient involvement in a specific work task (Csikszentmihalyi, 1975; Mills & Fullagar, 2008; Schaufeli & Salanova, 2007). Furthermore, work engagement has been operationalized varying between but also within individuals; flow has been shown to be a predominantly state-like construct that indicates far greater within-individual than between-individual variance (Fullagar & Kelloway, 2009).

Theoretical frameworks explaining flow at work

Although the majority of research on flow has focused on such leisure activities as sports and artistic endeavors, the experience of flow is more likely to occur in a work setting. It is at work that the conditions fostering flow are more prevalent, such as goal-directed challenging tasks that require high skill levels (Csikszentmihalyi, 1990; Csikszentmihalyi & LeFevre, 1989; Haworth & Hill, 1992; Hektner, Schmidt, & Csikszentmihalyi, 2007). In the following, we will present the theoretical frameworks that have been or could be used to explain the experience of flow. These frameworks refer to job characteristics, job resources, or positive affect.

Job characteristics

The job characteristics model (JCM) of Hackman and Oldham (1980) suggests that intrinsic motivational states occur when work is experienced as meaningful. This positive motivational psychological state is generated when jobs have certain core characteristics (Hackman & Oldham, 1980). First, the job must have skill variety, in that different skills and talents should be utilized to carry out the work. Second, the job should have task identity and require the completion of a whole and identifiable piece of work. Third, work should have task significance, meaning that it should have a substantial impact on other people or oneself. According to Hackman and Oldham (1976), the two most important and necessary job characteristics for generating intrinsic motivation are autonomy and feedback. Autonomy refers to the degree of discretion, freedom, and independence that an individual has in scheduling work
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and determining the procedural aspects of the job. Task feedback is the extent to which work activities provide information about the results of performance. Hackman and Oldham (1980) suggest that the combined score of these five core characteristics, called motivating potential score, represents an index of how motivating the job is designed to be.

Csikszentmihalyi (1975, 1990) has argued that flow is a critical psychological state that is also associated with high levels of intrinsic motivation. Indeed, those same characteristics of work that have been associated with high levels of motivation have been found to be associated with flow. For instance, Demerouti (2006) found that autonomy, skill variety, job feedback, task identity, and task significance, combined as a motivating potential score, were predictive of flow experiences among employees engaged in a variety of work and occupations. Elaborating on this research, Fullagar and Kelloway (2009), in a longitudinal study, studied the predictive validity of each of the five core job characteristics and found that skill variety and autonomy were both significantly and positively associated with flow experiences. Of the five job characteristics autonomy seems to be the most consistently and strongly related to flow (Bakker, 2005, 2008; Lin & Joe, 2012; Mäkikangas, Bakker, Aunola, & Demerouti, 2010; Salanova, Bakker, & Llorens, 2006). This is not surprising as employees’ freedom in scheduling their work and in determining their work methods has repeatedly been found to increase positive affect (e.g., Saavedra & Kwun, 2000) and motivation (Fried & Ferris, 1987). However, the relationship between autonomy and flow may be moderated by the nature of the work and the organizations studied. Nielsen and Cleal (2010) in an experience sampling study found that autonomy and role clarity were more significantly associated with flow among elder care managers than accountancy managers. The authors concluded that the studied organizations varied greatly in role clarity and complexity – that is, the possibilities to experience flow were different.

Proposition 1: The core job characteristics (skill variety, task identity, task significance, autonomy and feedback) are positively related to the experience of flow.

Proposition 2: Of the job characteristics, autonomy has the most beneficial effect on flow.

Job resources

Two other theoretical frameworks have been used to understand the antecedents of flow: conservation of resources theory (COR; Hobfoll, 1989) and job demands–resources theory (JD-R; Bakker & Demerouti, 2014; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The central tenet of the COR theory is that individuals are motivated to obtain, maintain, and protect personal resources that are important to the individual and serve as means to achieve valued outcomes.
These resources include physical possessions (e.g., money, home), conditions (e.g., marital status, close social attachments), energies (e.g., knowledge, time), and personal characteristics (e.g., self-esteem, self-efficacy). In the work context, the COR theory has been applied to the study of personal resources and psychosocial work characteristics (Hobfoll, Johnson, Ennis, & Jackson, 2003). Personal resources are aspects of the self that are generally linked to resilience (Mäkikangas, Feldt, Kinnunen, & Mauno, 2013), while job resources refer to the physical, psychological, social, or organizational aspects of the job and thus have both subjective and objective natures (see Demerouti et al., 2001). By accumulating resources, individuals are not only more capable of withstanding stress but also more likely to thrive and achieve high levels of subjective well-being (Lyubomirsky, King, & Diener, 2005). Applied to flow, COR theory would hypothesize that those individuals who gain more job and personal resources are more likely to experience high levels of work-related flow (Mäkikangas et al., 2010). Furthermore, the experience of positive flow states may initiate a gain cycle of resources (Hobfoll, 1989, 2002) that facilitates the accumulation of more job resources. Accordingly, Salanova et al. (2006) found in a two-wave study among teachers that personal resources (i.e., self-efficacy beliefs) and organizational resources (e.g., social support climate and clear goals) facilitated work-related flow over time. Moreover, work-related flow increased personal and organizational resources across time.

The JD-R theory (Bakker & Demerouti, 2014; Demerouti et al., 2001) has argued that certain job resources enable the individual to cope with the inherent stress of work and also trigger learning, development, positive well-being, and performance. Job resources refer to those physical, psychological, social, or organizational aspects of the job that are functional in achieving work goals, reduce job demands that are associated with physiological and psychological costs, or stimulate personal growth, learning, and development (Demerouti et al., 2001). In addition to job resources, the theory recognizes that each job also contains job demands that refer to those aspects of the job that require sustained effort and are therefore associated with certain physiological and/or psychological costs (Demerouti et al., 2001). One main difference between the JD-R theory and the JCM is that the former recognizes the importance of other job resources in addition to those included in the JCM (i.e., skill variety, task identity, task significance, autonomy, and feedback). Indeed, several other job resources than those included in the JCM have been found to be conducive to flow. For example, flow has been associated with social support, supervisory coaching, and opportunities for professional development (Bakker, 2005, 2008; Mäkikangas et al., 2010). Also, a high degree of social capital and innovative learning climate in the organization has been found to increase flow experiences (Fagerlind, Gustavsson, Johansson, & Ekberg, 2013).

Recently, it was shown that job demands, such as emotional dissonance or managing the relationships with patients, were negatively related to flow and in particular to intrinsic motivation and enjoyment in a sample of nurses (Zito, Cortese, &
Colombo, 2016). In another study among various professionals, Zito, Bakker, Colombo, and Cortese (2015) found that workload was positively related to absorption, which is consistent with Csikszentmihalyi (1990), who suggests that this type of job characteristic makes employees absorbed and immersed in their work. However, also in this study emotional dissonance was negatively related to enjoyment and intrinsic motivation, highlighting that suppressing emotions that do not correspond to work reality undermines pleasure and motivation at work. Thus, it seems that job demands are related to specific dimensions of flow, and their relationship is more often negative (particularly regarding hindering demands; Crawford, LePine, & Rich, 2010). However, job demands and flow can also be positively related when the demands are more challenging, like workload (Crawford et al., 2010). Therefore, future studies need to look into their relationship more thoroughly.

Regarding personal resources, Zito et al. (2015) found that internal locus of control and optimism were significantly and positively associated with flow. Specifically, internal locus of control was positively correlated with the three dimensions of flow, indicating that this personality orientation could enhance the optimal experience at work in all its forms. On the contrary, dispositional optimism was found to be related to enjoyment and intrinsic motivation, but rather weakly to absorption.

Another proposition of JD-R theory is that job demands and resources interact in predicting occupational well-being. Two forms of interactions have been studied: (1) job resources may buffer the impact of job demands on strain, and (2) job demands may amplify the impact of job resources on motivation. This latter form of interaction is relevant for flow as it has been found that it is predictive of work engagement of which the absorption dimension resembles flow. Specifically, Bakker, Hakanen, Demerouti, and Xanthopoulou (2007) found that supervisor support, innovativeness, appreciation, and organizational climate were important job resources for teachers that helped them cope with demanding interactions with students and be engaged in their work. Thus, work engagement is more often experienced when demands and resources are both high. Similarly, Bakker, Van Veldhoven, and Xanthopoulou (2010) found that task enjoyment and organizational commitment were the result of combinations of different and high job demands and job resources. From the components of flow, task enjoyment and commitment were highest when employees were confronted with challenging and stimulating tasks, and simultaneously had sufficient resources (e.g., performance feedback, high-quality relationships with colleagues).

**Proposition 3:** Job and personal resources have mutual positive relationships with flow over time such that resources trigger flow and flow, in its turn, triggers the accumulation of resources.

**Proposition 4:** (Hindering) job demands are negatively related to flow.

**Proposition 5:** Flow is more often experienced in jobs that combine high job resources with high (but affordable) job demands.
**Positive affect**

Two theories are relevant to clarify the role of affect in flow at work: broaden-and-build theory of positive emotions (B&B theory; Fredrickson, 1998, 2001) and the affective events theory (AET; Weiss & Cropanzano, 1996). The B&B theory proposes that positive emotions have a twofold adaptive function. First, they broaden our current awareness and thought-action repertoires. Second, they help us to build skills and resources in the long run and have a lasting impact on our psychological and physical well-being (Fredrickson, 1998). Research with the B&B theory shows that momentary experiences of positive emotions can build enduring psychological resources and trigger upward spirals toward emotional well-being. Thus, positive emotions make people not only feel good at the moment but also feel good in the future (Fredrickson & Joiner, 2002). Accordingly, positive experiences (e.g., flow at work) build people’s enduring personal resources (Salanova et al., 2006). In a similar vein, flow was found to be significantly and positively associated with energy after work, particularly if individuals were not able to recover from stress during work breaks but were able to detach from work at home (Demerouti, Bakker, Sonnenstag, & Fullagar, 2012). It would appear that flow states induce positive emotions and these emotions counteract the side effects of negative emotional arousal (Fredrickson & Levenson, 1998), increase life satisfaction, and improve overall well-being (Fredrickson et al., 2008).

The B&B theory has been used as a framework to study the development of high levels of flow over time. Building on B&B theory, Ceja and Navarro (2011) found that the development of the flow state followed a chaotic, unpredictable pattern. The link between positive emotions and unpredictability has been demonstrated empirically at different levels of analyses. Fredrickson and Branigan (2005) found that people induced to experience positive emotions reported a wider array of impulses to act in the moment, which made their behavior harder to predict. Furthermore, Fredrickson and Losada (2005) found that human flourishing is associated with nonrepetitive, innovative, and flexible interactions with the environment. Therefore, employees who experience high levels of flow at work are likely to be less predictable, as they seek novelty and opportunities for action and they are adaptable and flexible.

According to Weiss and Cropanzano’s (1996) affective events theory (AET), the work environment exerts its influence on momentary experiences and behavior through specific work events, such as attaining one’s goals or receiving a reward. According to AET, events are defined as significant happenings that produce a change in circumstances and “generate an emotional reaction or mood change in people” (p. 31). The theory differentiates positive events that are goal-congruent (e.g., receiving praise) and negative events that are incongruent with work-related goals (e.g., personal failures). Events are situational antecedents of affect and transmit their influence on flow through the affective reaction on the part of the individual (Bledow, Schmitt, Frese, & Kühl, 2011; Weiss & Cropanzano, 1996). Positive
events yield positive mood and increase the willingness to invest effort, including the
tendency to experience flow; negative events are associated with negative mood
and decrease enthusiasm and thus also the tendency to experience flow. If people
receive praise by their supervisor for a task they are working on, the subsequent
increase in positive mood should be supportive of flow experiences. In contrast, an
event such as becoming aware of a failure is incongruent with people’s goals and
should disrupt the experience of flow. Moreover, AET predicts that personality has
a substantial impact on which affective states are experienced and on how people
typically feel.

AET suggests that features of work (e.g., autonomy, supervisory support, work
overload) might have an impact on the experience of affect and other outcomes
(of which flow could be one) in two ways (Wegge, Van Dick, Fisher, West, &
Dawson, 2006; Weiss & Cropanzano, 1996). First, these features might function as
inputs in cognitive processes (e.g., in actual-target value comparisons) that indi-
viduals conduct to determine the “fit” between their job and their personal val-
ues, motives, or desires. In addition, the features might influence the occurrence
of specific events during work (e.g., conflicts with customers), which, in turn, stimu-
late different emotions. The second way in which job features might have
an impact on judgments of one’s work (of which flow is an example) is via their
impact on the occurrence of specific events during work, which, in turn, stimu-
late different emotions. These insights can be applied to the study of flow as flow
represents an experience close to situations or events. Moreover, flow includes
judgmental aspects (cf. enjoyment dimension of flow according to Bakker’s con-
ceptualization; 2005, 2008).

Proposition 6: The experience of state positive affect during flow moderates
(strengthens) the enduring favorable effect of flow on well-being and behav-
ior (e.g., job performance).

Proposition 7: Work characteristics influence the occurrence and/or judgment
of positive events, which consequently influence positive affect and flow
(mediation). Specifically, work characteristics like job resources influence
positive events in a favorable way.

The predictors of flow

There is general consensus that flow is characterized by intrinsic motivation (Keller &
Bless, 2008; Keller & Blomann, 2008). Consequently, there must be a compatibility
between individual characteristics, such as skill level and need for achievement, and
situational characteristics, such as the demands of the task and available resources. In
the following, we will focus on the preconditions of flow according to flow theory
as well as to other research findings on the predictors of flow that cannot be catego-
rized within the frameworks presented earlier.
Preconditions of flow

Flow theory has consistently identified three situational or task-specific preconditions that are necessary for flow to be experienced (Nakamura & Csikszentmihalyi, 2002). Perhaps the most important precondition of flow is that the challenges (action opportunities) that are perceived in the task should match with the skills (action capabilities) that are necessary to perform the task (Csikszentmihalyi, 1975, 1990, 1997). However, the level of challenges and skills is also essential. In order to experience flow, the perceived challenges and skills should be at a moderate to high level (Bassi, Ferrario, Ba, Delle Fave, & Viganò, 2012; Sartori et al., 2014), while when their level is low the individual is likely to experience apathy (Csikszentmihalyi, 1975). When challenges exceed perceived skills, anxiety is likely to arise while an overskilled performer for the task might experience boredom. The necessity of balance between perceived challenge and skill has been generally supported by research evidence (Eisenberger, Jones, Stinglhamber, Shanock, & Randall, 2005; Fullagar, Knight, & Sovern, 2009; Hektner & Asakawa, 2000; Llorens, Salanova, & Rodríguez, 2013). Nonetheless, there are some contradictions with flow theory. Several studies (e.g., Engeser & Rheinberg, 2008; Fullagar et al., 2009; Haworth & Evans, 1995; Hektner & Asakawa, 2000) have shown that tasks low in challenge and exceeded by skill level are often conducive to flow rather than boredom. These findings would suggest that the relationship between flow and challenge/skill balance may be moderated by the characteristics of the task being studied.

Flow is also facilitated by tasks that have clear and proximal goals (Csikszentmihalyi, 1990, 1997). This is consistent with goal-setting theory and is based on the premise that all human behavior is goal-directed (Locke, Shaw, Saari, & Latham, 1981). Both goal-setting theory and flow theory emphasize that goals should be both challenging and specific in order to direct attention and action (Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005; Latham & Locke, 1991; Locke et al., 1981). However, it is important to note that the purpose of goals as conceptualized by Locke and colleagues on the one hand and by Csikszentmihalyi on the other is not equivalent. Csikszentmihalyi views the role of goals as “channeling attention” (Csikszentmihalyi et al., 2005), not as an objective or end to which people strive, as in goal theory (Locke, 1968). For Csikszentmihalyi goals focus attention on the task at hand, thereby filtering out extraneous stimuli from the individual’s consciousness and promoting room for the experience of flow. In line with this reasoning, Demerouti, Bakker, and Fried (2012) found that an increase in role clarity was positively related to the enjoyment and concentration components of flow. Alternatively, Delle Fave and Massimini (2005) showed that the interplay between wishing to do the activity and the relevance of the activity to future goals shapes the daily experience of flow in productive activities.

The final precondition to optimal experience according to flow theory is task feedback (Csikszentmihalyi, 1990, 1997). Feedback is an integral component of goal setting (Locke et al., 1981) and flow (Csikszentmihalyi, 1975), in that
without it intrinsic goals cannot sustain motivation and enhance flow. Feedback is particularly important for the more difficult and challenging tasks that are associated with flow. The role of feedback in the experience of flow has been studied within the JCM and the JD-R model and was confirmed in several studies mentioned earlier.

**Other predictors of flow**

Nielsen and Cleal (2010) found three specific work activities to be associated with flow at work: planning, problem solving, and evaluation. Each one of these activities provided individuals with the opportunity to use skills and to create structure and clarity in the job. In addition, the combinations of psychological demands and decision latitude based on the demand–control model (Karasek, 1979; Karasek & Theorell, 1990) have been used to explain flow at work. It was found that employees in active (high psychological demands, high decision latitude) and low-strain jobs (low psychological demands, high decision latitude) experienced more flow than employees working in passive jobs (low psychological demands, low decision latitude) and high-strain jobs (high psychological demands and low decision latitude) (Fagerlind et al., 2013). Again these results highlighted the importance of job control/autonomy for flow, as mentioned also before.

Personal resources relating especially to personal resiliency were mentioned as important predictors for flow in many of the theories presented earlier (i.e., AET; Weiss & Cropanzano, 1996; B&B theory; Fredrickson, 1998, 2001; COR theory; Hobfoll, 1989). Although the role of personality has been mainly depicted to be a moderating factor between job characteristics and flow, it has also been shown to directly predict flow. For example, it has been shown that from the big five personality traits, emotional stability and conscientiousness together explained 22% of the variance in flow (Ullén et al., 2012). Hence, personality traits along with other personality dispositions, such as optimism (Beard & Hoy, 2010) and self-efficacy (Salanova et al., 2006), are important facilitators of flow. Also the temporal pacing style that individuals use to deal with deadlines has been related to flow. Gevers and Demerouti (2013) in a weekly study on flow found that leaders’ temporal reminders related positively with task absorption for individuals who scored high rather than low on the deadline action pacing style (i.e., those who work a lot on an assignment right before the deadline approaches). However, leaders’ temporal reminders inhibited task absorption for those who work steadily on an assignment (i.e., steady action pacing style) and those who work a lot on an assignment at the beginning and at the end of the duration (i.e., U-shaped action pacing style).

Finally, it is worth noticing that the role of intelligence (Ullén et al., 2012), cognitive capacity (Percival, Crous, & Schepers, 2003), and level of global functioning (Bassi et al., 2012) for flow experiences has been also investigated. However, no persuasive evidence for such positive relationships was found. Therefore, it could be concluded that situational factors (i.e., job characteristics) combined with suitable
energy level (Mäkikangas et al., 2010) and available personal resources are the most important determinants for flow at work. Another conclusion based on the literature is that flow can be experienced in any kind of job (if specific conditions are present) rather than only in jobs with high requirements and ranking.

Conclusion

In this chapter, we have introduced several theories that are useful in explaining flow at work. Two of these theories (i.e., JCM and JD-R) focus specifically on the role of job characteristics for well-being and motivation at work, while the other three (i.e., AET, B&B, COR) focus more broadly on explaining context-free well-being by underlying the role of different individual resources and/or positive emotions. Based on these theories and also empirical results presented in this chapter, we delineated several propositions for future research on flow at work. The most important propositions are the following:

1. Job resources – especially autonomy – are positively related to flow.
2. Flow is more often experienced in jobs that combine a high level of job resources with high (but affordable) job demands.
3. Positive events (at work) trigger positive emotions and flow and consequently enhance well-being and positive future work behavior.
4. Flow has a reciprocal relationship with job and personal resources.

To further understand flow at work, we need to use innovative study designs that focus especially on the short-term nature of flow. First, diary designs should be emphasized. Second, flow should be investigated simultaneously by using the traditional experience sampling method and questionnaires in order to understand flow better in a work context. Third, the moderating and mediating associations between job characteristics, personal resources, and flow should be further investigated by taking into account the nature of the job and type of business. Fourth, the role of personality as well as personal goals for flow experiences should be further investigated.

With this chapter we attempted to put flow on the research agenda by zooming in on the factors that contribute to flow at work. By discussing various theoretical frameworks that can be used or are already used to explain flow, we hope that we inspire researchers and practitioners to develop ways to enhance flow at work, as flow represents an experience that should be stimulated in organizations. Flow at work represents an important phenomenon of organizational practice that deserves more attention than it currently receives. We suggested several possible mechanisms and predictors that are beneficial for the experience of flow. The next step would be to develop interventions that stimulate flow experiences and to justify the effectiveness of such interventions. As has been shown, flow at work is significant for organizations and warrants consideration in the future from both scientists and practitioners alike.
References


What predicts flow at work?


Freeman Dyson, a renowned theoretical physicist, describes the process of entering flow as a sort of struggle:

I have to always force myself to write, and also to work harder at a science problem. You have to put blood, sweat, and tears into it first. And it is awfully hard to get started. I think most writers have this problem. I mean, it’s part of the business. You may work very hard for a week producing the first page. That’s really blood, tears, and sweat, and there is nothing else to describe it. You have to force yourself to push and push with the hope that something good will come out. And you have to go through that process before it really starts to flow easily, and without that preliminary forcing and pushing probably nothing would ever happen. So, I think that is what distinguishes it from just having a good time. You really enjoy the activity once you are really in the flowing phase, but you have to overcome some sort of a barrier to get there.

(Csikszentmihalyi, 1997, p. 117)

It is this same struggle that employees face in their everyday experience at work, as they must be continually responding to motivational forces, such as entropy or equilibrium, and instability or the enjoyment that comes from confronting new challenges. The force of entropy is more primitive and tends to be stronger. This force gives employees pleasure when they are comfortable, when they can relax, when they can get away with feeling good without expending energy (Csikszentmihalyi, 1997). Entropy leads the employee to a zone of stable equilibrium. If employees did not have this space of equilibrium or built-in regulator, they could easily become burned out and would lack the necessary strength to develop their daily work activities.
Nevertheless, employees have also the urge to master new challenges and stretch their skills to the utmost (Csikszentmihalyi, 1997). This force leads employees into a zone of expansive instability, such as the “flowing” zone described by Freeman Dyson. Without this expansive force, employees would remain in the “equilibrium” zone, where they tend to repeat work-related activities the same way they have done it in the past. The expansive force leads employees to experience flow and therefore high levels of creativity (Csikszentmihalyi, 1996), performance (Demerouti, 2006), and well-being (Fullagar & Kelloway, 2009). Work-related flow can be defined as a sudden moment where everything “just clicks,” or a state of being in the zone, when affective and cognitive modes are perfectly synchronized, giving rise to employees’ greatest performances and personal bests (Csikszentmihalyi, 1990).

Work-related flow is a developmental and dynamic phenomenon that undergoes continuous changes over time (Rathunde & Csikszentmihalyi, 2006). Every flow experience contributes to the growth of the self (Delle Fave, Massimini, & Bassi, 2011; Massimini & Delle Fave, 2000). After every episode of flow, employees are a little different from what they were before. Their consciousness contains fresh information about the new skills they have developed – for instance in the foregoing example, Freeman Dyson, after passing the barrier of entropy and facing the challenge of solving a science problem, is likely to go away with a proud knowledge that he has finally gained a better understanding of his subject of study. To continue providing optimal experiences, flow activities must be constantly recreated and Freeman Dyson’s struggle to find flow emerges every time employees visualize new opportunities for action.

Csikszentmihalyi (1990) states that disequilibrium between challenges and skills is inevitable and needs to be continually addressed by the employee. In other words, coping with work events unfolds dynamically over time, so the same work activity may be a source of distress or positive challenge at different times. In the simplest terms, an employee transforms boredom into flow by finding new challenges and overcomes anxiety by building on new skills. This process proceeds in the direction of greater complexity, creating highly unstable realities.

The definition of flow has changed very little since Csikszentmihalyi’s original formulation in 1975, and there is strong agreement among researchers on the definition itself. At the same time the models of flow, in conjunction with its measurement methods, are changing, and modifications of the flow theory are starting to emerge (Moneta, 2012). In this sense, when work-related flow is studied longitudinally over short periods of time (e.g., days, weeks, and months), it presents continuous fluctuations and changes (Fullagar & Kelloway, 2009). Likewise, several studies have found that flow at work tends to behave in a nonlinear manner (e.g., Ceja & Navarro, 2011; Guastello, Johnson, & Rieke, 1999). Ergo, a new mind-set for understanding work-related flow has started to emerge; this new mind-set considers nonlinearity and discontinuous change that employees experience in their everyday struggle of transitioning between a nonflow state (e.g., boredom or anxiety) and the flow state.

The present chapter aims to contribute to the development of this new mind-set for understanding work-related flow as a highly dynamic process, by integrating
Redefining flow at work

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In our view, new approaches to study flow that consider its dynamic nature are necessary for at least two reasons. First, although research on work-related flow has focused on intra-individual variation, most research is based on methods that focus on variation between subjects. There is growing evidence that developmental processes, such as flow, are nonergodic processes, which are better studied using person-specific dynamic models (Molenaar & Campbell, 2009). Second, findings from physiology, psychology, and management have shown that certain properties of nonlinear systems, notably chaotic dynamics and catastrophic changes, are indicative of health, innovation, and creativity. Hence it becomes relevant to understand the dynamic nature of chaos to understand the behavior of optimal experiences at work, such as flow.

Overall, the present chapter will describe how the integration of NDS theory with the study of flow can represent an important step for understanding optimal experience at work, as a nonequilibrium condition where abrupt and discontinuous changes naturally emerge. Similarly, this enriched conceptualization of work-related flow can have important implications for organizational practice. For instance, managers can increase optimal experience at work by designing interventions according to a nonlinear model of work-related flow. We will organize the chapter as follows. We will start off by outlining why flow can be considered as a nonergodic process and therefore it is important to study the intra-individual variation of flow using person-specific dynamic models. Next, we will give an overview of NDS theory and potential applications to questions in work-related flow, and the relevance of NDS methods for developing person-specific dynamic models. Finally, we will discuss the implications that this nonlinear conceptualization has for research and organizational practice.

Flow as a nonergodic process

Although the value of flow at work is being actively explored and scholars have provided valuable insights regarding its main components, research has mainly been focused on variation between people (Ceja & Navarro, 2012). The overreliance on interindividual variation is not unique to work-related flow scholarship; rather, it is common to most research areas in psychology (Molenaar, 2004; Molenaar & Campbell, 2009; Roe, 2013).

Interindividual variation is used to derive statistics (e.g., means, correlations) that characterize the state of affairs in the population of subjects. In other words, the statistics concerned are obtained by pooling across people; this is a key hallmark of interindividual variation. Nowadays in psychology most statistical methods are centered on the analysis of interindividual variation, regardless of whether the data are collected cross-sectionally, longitudinally, or using multilevel designs (Molenaar & Campbell, 2009). It seems natural and reasonable to infer that conclusions about the state of affairs at the population level can imply general findings that apply to each individual person in the population. Nonetheless, applying
the findings obtained by grouping individual scores to determine the behavior of a single person involves a shift in level (a change from the interindividual variation to that of intra-individual variation in time and place). Based on the classical ergodic theorems, a classic branch of mathematics originally motivated by problems of statistical physics, Molenaar and Campbell (2009) argue that this shift in level is not valid for most cases in psychology, especially when we are dealing with developmental processes.

The classical ergodic theorems provide two rigorous conditions under which a shift in level from interindividual variation to that of intra-individual variation is possible and vice versa (Molenaar, 2004), thus allowing to define a phenomenon as **ergodic**. First, the same statistical model should apply to the data of all subjects in the population, suggesting a homogeneity in the study population. Second, the data must be stationary. More specifically, the data should have invariant statistical characteristics over time (i.e., it must have constant mean, variance, etc.). Accordingly, if either one (or both) of the conditions is not met, the psychological process we are dealing with is **nonergodic** (Molenaar & Campbell, 2009). Therefore the structure of its interindividual variation will differ from its structure at the intra-individual level of analysis. For all **nonergodic** psychological process, the results obtained in standard analysis of interindividual variation will not apply at the level of intra-individual variation and the other way around.

The question that concerns us here is whether flow can be considered an ergodic or a nonergodic process. In order to provide an answer to this question, we will review whether the process of work-related flow meets both ergodic conditions: **homogeneity** and **stationarity**.

### Condition 1: homogeneity

The first condition for considering flow as an ergodic process is that each person in the population has to follow the same statistical model – that is, there has to be homogeneity in the population. In other words, the dynamics of the main variables describing the data should be invariant across subjects. For example, according to the flow theory, flow is greatly predicted by the balance between perceived challenges and skills (Fullagar et al., 2009; Moneta & Csikszentmihalyi, 1996). The homogeneity condition for **ergodicity** implies that the regression coefficients of challenge, skill, and the balance of the two must be invariant across people. However, when we look at empirical examples we find that the effects of challenge and skill and the balance between the two differ across individuals (Moneta & Csikszentmihalyi, 1996), so that, for instance, balance between challenges and skills is a strong predictor of flow for some individuals, while for other individuals this balance does not predict flow or even has a negative effect on the experience of the individual. Likewise, the effects of challenge, skill, and balance have been found to be linked to personality traits – such as achievement orientation, trait intrinsic motivation, and interdependent self-construal (Eisenberger, Jones, Stinglehamber, Shanock, & Randall, 2005; Moneta, 2004). Therefore, one of the main tenets of the flow model
appears to be fully applicable only to some individuals. We have here a clear example of the violation of the homogeneity condition for being able to consider flow an ergodic process. More specifically, the intra-individual models appear to differ between subjects regarding how the balance between challenge and skill affects the flow experience of employees.

In an unpublished research (i.e., Paredes, 2012) that we have conducted measuring challenge and skill during twenty-one consecutive working days in a sample of sixty workers (6,981 registers obtained), we found that these two critical variables for the flow theory show different correlation values across individuals (Table 5.1). In this way, there are participants in which there is a positive correlation between challenge and skills; there are participants who present a negative correlation between these variables; and, finally, there is also a third group of participants in which these variables are unrelated. These results provide a clear evidence of the nonhomogeneity across subjects in flow at work.

**Condition 2: stationarity**

The second condition for ergodicity is that flow should have constant statistical characteristics over time (i.e., stationarity). In other words, the statistical parameters of the data, such as standard deviation and mean, should remain invariant across all time points. Molenaar and Campbell (2009) state that prime examples where this condition is violated are developmental processes, which almost by definition have statistical characteristics that change across data points. In this sense, Rathunde and Csikszentmihalyi (2006) define flow as a developmental process, due to the fact that every flow experience contributes to the growth of the self. After every episode of flow, employees are a little different from what they were before, as they have increased their skill level regarding a specific task.

When we look at empirical findings from research using longitudinal ESM data, we find that work-related flow is highly unstable and strongly dependent upon situational conditions (e.g., Fullagar & Kelloway, 2009; Guastello, Johnson, et al., 1999). In a study of work-related flow, Ceja and Navarro (2009) used the standard deviation value and the mean squared successive difference (MSSD; Von Neumann, Kent, Bellison, & Hart, 1941) to assess variations in response over time, such as fluctuations in the flow components. The authors chose to use the MSSD since they

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Number of participants</th>
<th>% of participants</th>
<th>Average value of the correlation</th>
<th>SD value of the correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>12</td>
<td>20</td>
<td>0.504</td>
<td>0.236</td>
</tr>
<tr>
<td>Negative</td>
<td>33</td>
<td>55</td>
<td>–0.465</td>
<td>0.193</td>
</tr>
<tr>
<td>No correlation</td>
<td>15</td>
<td>25</td>
<td>–0.008</td>
<td>0.101</td>
</tr>
</tbody>
</table>
were interested in the variability over time of the flow variables; the range of the scale used was from 0 to 100. The results from this study are shown in Table 5.2.

In Table 5.2 we can observe the average number of records per participant (N = 20 participants), minimum and maximum per flow measure,\(^1\) and the mean value and standard deviation. In this case the standard deviation gives us information on the persistence of flow or its stability; as we can see all standard deviations and MSSD values are high, showing unstable behavior for all variables.

Likewise, Ceja and Navarro (2009) found that when time series coming from both measures of flow (measure 1 and measure 2) were presented in line graphs (an example of measure 1 and 2 is shown in Figure 5.1), fluctuating dynamics are revealed.

Likewise, Fullagar and Kelloway (2009) found that 74% of the overall variance in work-related flow can be attributed to intra-individual variation. Similarly, a study by Rodríguez-Sánchez et al. (2011) found a curvilinear daily flow pattern, with lower levels of flow during working hours and higher levels of flow at the end of the day. All these studies demonstrate that the concept of flow denotes change and evolution over time. Hence, it becomes clear that flow is a nonstationary

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**TABLE 5.2** Descriptive statistics from the time series (adapted from Ceja & Navarro, 2009)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of records per participant</th>
<th>Minimum</th>
<th>Maximum</th>
<th>M</th>
<th>SD</th>
<th>MSSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow measure 1</td>
<td>119</td>
<td>0</td>
<td>49.30</td>
<td>9.28</td>
<td>7.98</td>
<td>50.40</td>
</tr>
<tr>
<td>Flow measure 2</td>
<td>119</td>
<td>0</td>
<td>100</td>
<td>64.96</td>
<td>22.61</td>
<td>55.24</td>
</tr>
</tbody>
</table>

---

**FIGURE 5.1** Measures of flow 1 and 2 (adapted from Ceja & Navarro, 2009)
process – the associations among variables characterizing flow change in time. This is a clear violation of the stationarity condition for ergodicity: constant statistical parameters of the data over time.

As we can see from the foregoing analysis, flow can be considered a clear example where the two conditions for ergodicity – homogeneity of population and invariant statistical characteristics over time – are not met, and therefore we are talking about a nonergodic process (i.e., its structure of interindividual variation differs from its structure of intra-individual variation). Because flow appears to be a person-specific process (i.e., the flow process obeys person-specific dynamic models), its analysis must be based on intra-individual variation (Hamaker, 2012).

For this kind of process the nonlinear dynamical systems (NDS) theory offers a wide variety of methods that focus on within-person dynamics (e.g., Guastello, Koopmans, & Pincus, 2009). Therefore, in our view, the NDS approach has a great deal to contribute to theory and empirical work on flow, as it examines person-specific models across time. More specifically, this approach gives us tools to assess the complexity of each person’s fluctuating behavior respecting the nonergodic characteristics of work-related flow. It can also help researchers in tackling individual differences in the pattern or shape of a participant’s variations. Whether assessing the quantity – or the quality and style – of a person’s changes, the focus is on finding indexes of intra-individual change that can be related to optimal levels of flow. The following section will tackle the second objective of this chapter: to explore the utility of NDS theory to enhance our understanding of work-related flow.

NDS theory: a promising approach to studying the dynamics of work-related flow

The NDS approach, also known as complexity theory, emerged during the 1960s from different theoretical and empirical approximations (e.g., general systems theory, chaos theory, fractal geometry, catastrophe theory, fuzzy sets theory; e.g., Guastello, 2002). These theories come from a wide variety of disciplines that share a common interest: the study of specific characteristics of complex systems, such as the existence of nonlinearity and deterministic chaos, fractal structures, catastrophic changes, and fuzzy boundaries (Munné, 2005). They propose a systemic view in which variables relate with one another continuously in a nonlinear way. This way, variables are antecedents and consequences simultaneously, generating emerging properties through their interaction. These types of systems are denominated as complex adaptive systems (Navarro, 2005).

Psychologists in general have shown increased interest in the application of NDS theory to the study of human processes and they obtained important empirical outcomes, predominantly in developmental (e.g., Smith & Thelen, 1993), social (e.g., Nowak & Vallacher, 1998), and organizational psychology (e.g., Guastello et al., 2009). The application of NDS models to positive organizational processes is not too plentiful; nonetheless, the link between nonlinear change and positive
psychology has been demonstrated theoretically (Schuldberg, 2006, 2007), as well as in empirical studies that have examined positive organizational behaviors like high work motivation (Arrieta, Navarro, & Vicente, 2008) and, more recently, work-related flow (Ceja & Navarro, 2009, 2011; Guastello, Johnson, et al., 1999; Navarro & Ceja, 2011). For a revision about the relations between nonlinear dynamics and positive organizational behavior see Navarro and Rueff-Lopes (2015).

Overall, there is evidence to suggest that complexity, change, and nonlinearity are integral to employee well-being. In other words, the relationship between work and employee flourishing is not strictly linear and stable over time; on the contrary, employee well-being seems to be rather unpredictable, with sudden, discontinuous, or unexpected changes (Schuldberg, 2006, 2007). Hence, NDS theory offers an interesting framework from which to study positive psychological processes like flow at work, providing an alternative perspective to the current prevailing paradigm, which emphasizes linear change (i.e., the overuse of techniques based on the general linear model assume the idea of proportionality and gradual change in the relations among variables). There are two key concepts of NDS theory that, in our view, can open interesting avenues for future research on work-related flow: chaotic behavior and catastrophic changes.

**Chaos and work-related flow**

Chaos refers to a particular nonlinear dynamic, and it can be viewed as a centerpiece of NDS theory (Guastello, 2002). The chaos phenomenon was discovered by Lorenz (1963) largely by chance while he was developing his work on weather forecasting, and it was later coined by Li and Yorke (1975). It can be defined as “aperiodic bounded dynamics in a deterministic system with sensitive dependence on initial conditions” (Kaplan & Glass, 1995, p. 27). According to Tsonis (1992), the concept of chaos underlies two fundamental epistemological truths in science. First, apparently random behavior (e.g., epidemic dynamics, behavior of stock market prices) is actually the result of simple deterministic rules. In other words, deterministic laws can produce behavior that appears random. Second, a chaotic phenomenon is best modeled using nonlinear techniques, such as recurrence analysis and catastrophe models, to name a few, which usually work with time series.

Chaotic behavior shows various fundamental characteristics (Guastello, 2002; Kaplan & Glass, 1995). First, chaotic behavior is unpredictable; this is to say that the dynamic never passes the same point twice. The unpredictability of chaotic behavior makes it resemble a random dynamic, especially when using techniques that are unable to capture the nonlinear structure of the dynamic (e.g., traditional linear statistical techniques). Second, chaotic behavior displays sensitivity to initial conditions, which means that even mild and brief inputs at a specific point in time can have important consequences in the long run. This property is also known as the butterfly effect. For example, in weather forecasting, seemingly trivial inputs – such as the flap of a butterfly’s wings in one region of the world – can disproportionately determine weather conditions in another place (Lorenz, 1993). The sensitivity to
the initial conditions is connected to the unpredictability of the dynamic in the long term. Third, chaotic dynamics exhibit clear boundaries, meaning that the dynamic stays within a confined range of values. Fourth, chaotic behavior is deterministic, meaning that it is regulated by simple deterministic equations.

The discovery of chaos has important implications for work and organizational psychology. For instance, the notion of prediction takes on new aspects when seen through the lens of chaos. As stated before, one of the main characteristics of chaos is that it is unpredictable in the long term. Hence, what organizational scholars thought was simple becomes complex, and questions arise regarding measurement, predictability, and verifications of classic theories regarding organizational behavior. In compensation, phenomena that appear random or stochastic may in fact be following simple rules. More specifically, a great part of the within-individual variability observed in organizational behavior that was previously conceived as random error can now be identified as obeying deterministic rules.

The last few decades have been fruitful for NDS theory in terms of the development and improvement of different methodologies for identifying and measuring deterministic chaos, such as the recurrence analysis, the surrogate data analysis, the Lyapunov exponents, the Kolmogrov entropy, the Hurst exponents, and catastrophe modeling, to name a few. These techniques allow researchers to identify the type of dynamic (i.e., chaotic, linear, or random) underlying in time series, and to know the amount of variables involved in the dynamic (see Heath, 2000; Ramos-Villagrasa & García-Izquierdo, 2011).

Based on the fruitful advancements of NDS methodologies for identifying and measuring chaos in time series, examples of chaotic behavior have been detected among different disciplines (e.g., for the physical sciences, see Prigogine & Stengers, 1984; meteorology, see Lorenz, 1993; organizational behavior, see Guastello, 2002, or Navarro & Arrieeta, 2010; physiology, see Freeman, 1991; psychology, see Barton, 1994, or Guastello et al., 2009). The manifestation of chaos in a wide variety of fields supports the universality of chaos proposed by Cvitanovic (1989), who suggested that chaotic behavior is universal and therefore can be observed in a wide variety of phenomena across all scientific disciplines, meaning that different systems are governed by the same rules – for example, the same rules can be operating in physiological systems and organizational behavior. One of these universal rules is the appearance of variability of behavior in healthy systems.

**Healthy variability in the workplace**

Following the principle of the universality of chaos and of particular relevance to research on work-related flow, there is an intriguing and controversial literature in physiology suggesting that specific characteristics of complex systems – mainly chaos – are related to well-being and optimal organ functioning (e.g., Freeman, 1991; Goldberger, 1991). More specifically, there is strong evidence demonstrating the existence of chaos in the cardiac (Goldberger, 1991) and neurological (Freeman,
systems of healthy patients, in contrast to unhealthy patients, who show periodic or linear dynamics in both cardiac and neurological systems.

Based on these findings, organizational psychologists have also found a link between chaos and well-being (for a revision see Navarro & Rueff-Lopes, 2015). For example, Arrieta et al. (2008) demonstrated empirical evidence of chaos in the intraperson variability of highly motivated employees. Three pioneering studies on work-related flow showed similar results; when employees’ time series were analyzed, most employees revealed nonlinear or chaotic behavior, whereas linear dynamics were the exception (Ceja & Navarro, 2009, 2011; Guastello, Johnson, et al., 1999). Ceja and Navarro (2011), for instance, demonstrated that higher levels of flow are associated with chaotic behavior, whereas linear behavior is associated with feeling anxious, and apathy is linked to random behavior. The authors conclude that there may be such a thing as “healthy nonlinear variability,” and a decrease in such nonlinearity may indicate a decrease in employee well-being.

In light of the foregoing findings, understanding the structure and behavior of chaos may provide further insights regarding employee well-being and can open new directions for future research on work-related flow. It appears that flow behaves mainly in a chaotic manner; therefore, NDS methodologies (e.g., recurrence plots, surrogate data, catastrophe modeling) that are able to describe and model chaotic behavior have a great deal to contribute to theory and empirical work on flow. Such methodologies can substitute, in some cases, or complement, in others, classical linear approaches by offering new tools with which scholars are able to study and model the linear and nonlinear evolution of work-related flow in an integrative manner. In this sense, it is important that future studies continue to examine the pattern of change observed in the intraperson variability of flow.

An important question that would benefit from further conceptual development as well as empirical research is what variables are responsible for the emergence of different dynamical patterns (i.e., chaotic, random, or linear) observed in work-related flow. Ceja and Navarro (2011) found that high levels of the core components of flow (e.g., balance of perceived challenge and skill, merging of action and awareness) are associated with the emergence of chaotic behavior. Likewise, employees’ job features such as more seniority, longer job tenures, a full-time job contract, low flexibility of working hours, and a typical weekly schedule are linked to chaotic behavior. Future research could explore in more detail these findings. For instance, it seems that productive organizational behavior (e.g., to experience flow at work) requires specific boundaries in labor conditions in order to contain these creative outbursts. Studies exploring organizational facilitators of work-related flow, distinguished in previous flow research (e.g., Bakker, 2005; Demerouti, 2006), and their association with chaotic behavior may also help to shed further light on this issue. Likewise, recent studies recognize work engagement as a primary condition for experiencing work-related flow (Moneta, 2010). Hence, it may be interesting to further study the role of work engagement in the emergence of chaos in the intraperson variability of flow.

Overall, future research is needed to clarify the dynamic patterns underlying work-related flow across time; the variables responsible for the emergence of distinct dynamical patterns, especially the emergence of chaotic patterns; and the role
of other related constructs (e.g., work engagement, mindfulness) in the relationship between chaos and flow.

**Catastrophe theory and flow: modeling abrupt and discontinuous change**

It has been demonstrated that work-related flow presents continuous fluctuations, generally nonlinear, across time (Ceja & Navarro, 2009, 2011; Guastello, Johnson, et al., 1999). Based on the catastrophe theory, Ceja and Navarro (2012) modeled for the first time the abrupt and discontinuous changes observed in the process of flow at the intra-individual level. Catastrophe theory (Thom, 1975; Zeeman, 1977) offers an alluring approximation for modeling the fluctuating reality of work-related flow. It is interested in describing and modeling the discontinuities that can appear in the evolution of a system. A catastrophe can be understood as abrupt or drastic changes that emerge as a consequence of small changes in the external conditions (Guastello, 1987). Catastrophe theory has been successfully used in different areas of work and organizational psychology, such as accidents involving health care workers (e.g., Guastello, Gershon, & Murphy, 1999), work motivation (e.g., Guastello, 1987, 2002), employee turnover (e.g., Sheridan, 1985), personnel selection (e.g., Guastello, 1982), workplace bullying (Escartín, Ceja, Navarro, & Zapf, 2013), and organizational change (e.g., Bigelow, 1982), among others.

More specifically, catastrophe theory provides an adequate conceptual framework as well as the mathematical tools for studying and modeling the possible nonlinear relationships between control parameters or independent variables and order parameters or dependent variables. There are seven elementary catastrophe models, whose degree of complexity depends upon the number of order (dependent variable) and control (independent variable) parameters. The cusp catastrophe model, one of the simplest and most widely used, explains the discontinuous change between two stable states of behavior by means of two control parameters and one order parameter. Work-related flow has been recently modeled as a cusp catastrophe (Ceja & Navarro, 2012; Navarro & Ceja, 2011; see Figure 5.2).

**FIGURE 5.2** Cusp catastrophe model (left panel) and traditional linear regression model (right panel) of flow experiences at work (adapted from Ceja & Navarro, 2012; Navarro & Ceja, 2011)
To illustrate the topographic differences between a cusp catastrophe model of flow and a traditional linear regression model, we show in Figure 5.2 both models. In the left panel of Figure 5.2 the cusp catastrophe model of flow is shown, which describes the change in the order parameter or dependent variable (i.e., flow: average of enjoyment, interest, and absorption) as a result of the interaction between perceived challenge and skill. In the right panel of Figure 5.2 a traditional linear regression model is shown containing the same set of variables. What differentiates both models is the fold shown in the catastrophe model, which indicates that for given values of the independent variables the dependent variable can present discontinuous or abrupt changes within the cusp region (represented by the fold region), whereas in the traditional linear regression this fold is not considered and sudden or abrupt changes are considered as outliers or noise in the data, and therefore this information is not included in the model.

Due to the topographic differences in the linear and nonlinear models, Ceja and Navarro (2012) hypothesized that a cusp catastrophe model could better capture the complexity and nonlinearity of the relationship between challenge-skill balance and work-related flow, compared to a linear regression model. Indeed, this was the case; findings from this study supported the better performance of the cusp catastrophe model over its linear counterpart (see Table 5.3) as shown by the lower AIC and BIC and higher R² indexes presented by the catastrophe model. The authors suggest that the superiority of the cusp catastrophe model for modeling flow is due to

**TABLE 5.3** Fit statistics for linear, logistic, and cusp models (adapted from Ceja & Navarro, 2012)

<table>
<thead>
<tr>
<th></th>
<th>Linear</th>
<th>Logistic</th>
<th>Cusp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow AICc</td>
<td>978.95**</td>
<td>503.47</td>
<td>265.46**</td>
</tr>
<tr>
<td>Flow BIC</td>
<td>989.71**</td>
<td>516.79</td>
<td>281.16**</td>
</tr>
<tr>
<td>Flow R²</td>
<td>.23</td>
<td>.44</td>
<td>.39</td>
</tr>
<tr>
<td>Enjoyment AICc</td>
<td>1031.31**</td>
<td>363.70</td>
<td>361.07**</td>
</tr>
<tr>
<td>Enjoyment BIC</td>
<td>1031.79**</td>
<td>376.94</td>
<td>332.72**</td>
</tr>
<tr>
<td>Enjoyment R²</td>
<td>.19</td>
<td>.47</td>
<td>.45</td>
</tr>
<tr>
<td>Interest AICc</td>
<td>1018.69**</td>
<td>981.09</td>
<td>267.05**</td>
</tr>
<tr>
<td>Interest BIC</td>
<td>1026.02**</td>
<td>1001.33</td>
<td>282.64**</td>
</tr>
<tr>
<td>Interest R²</td>
<td>.24</td>
<td>.38</td>
<td>.42</td>
</tr>
<tr>
<td>Absorption AICc</td>
<td>994.54**</td>
<td>785.73</td>
<td>245.95**</td>
</tr>
<tr>
<td>Absorption BIC</td>
<td>1005.09**</td>
<td>799.05</td>
<td>261.51**</td>
</tr>
<tr>
<td>Absorption R²</td>
<td>.20</td>
<td>.35</td>
<td>.49</td>
</tr>
</tbody>
</table>

Note: The AIC, BIC, and R² were calculated as the average of all participants. The trimmed mean was used in order to eliminate outliers or extreme observations, discarding 5% of the values at the high and low ends. AICc = Akaike information criterion corrected; BIC = Bayesian information criterion. N = 6,981 logs across 60 participants. The chi-square likelihood ratio test was calculated for the AICc and BIC indexes. ** p < .0001.
its capacity to model both linear and nonlinear relationships as well as gradual and discontinuous changes in an integrative way. Likewise, Navarro and Ceja (2011) examined the application of a cusp catastrophe model to modeling flow in work and nonwork activities; the results demonstrated the better performance of the cusp catastrophe model over its linear counterpart (i.e., linear regression model) in both domains. Moreover, Ceja and Navarro (2012) found that perceived challenge plays an especially important role in the dynamics of flow, as it indicates the number of discontinuities in employees’ work-related flow.

In view of the foregoing findings, flow at work seems to present discontinuous as well as continuous changes across time. Therefore, catastrophe theory appears to be an adequate approximation for modeling this combination of changes. Moreover, it enriches our capacity to understand, characterize, and integrate different patterns of change (e.g., gradual and continuous as well as abrupt or discontinuous). In our view, future research on work-related flow should continue examining the application of the different models proposed by catastrophe theory (e.g., elementary cusps; see Guastello, 1987) to study changes in flow among different employee populations.

There are three interesting avenues for future research in this area. First, further research is needed to compare the performance of catastrophe models to that of more traditional statistical linear approaches (i.e., linear regression analysis, HLM, growth curve modeling). Second, perceived challenge seems to be the variable responsible for the emergence of bifurcations. In other words, perceived challenge appears to present a threshold beyond which two divergent behaviors are possible (i.e., low and high levels of flow). Hence, future research is needed to examine the role of challenge and other variables (e.g., dimensions of flow, organizational facilitators of flow) as determinants of the phase transitions as employees move into and out of an optimal experience. Likewise, it would be interesting to study whether the specific values of perceived challenge at which the bifurcation point is created are distinct for each employee or whether similarities in terms of threshold can be found between different employees. Third, an interesting area for future research may be to study situation- and person-related predictors of the sudden and abrupt changes observed in work-related flow over time. On the whole, research in this area will surely add valuable information to the flow theory.

In the following section we will describe several approaches for assessing intra-individual variability in work-related flow relying on NDS theory. Afterwards, we will propose some important implications for practitioners as well.

**Implications for academics and practitioners**

At the beginning of this chapter we argued that flow can be considered as a nonergodic developmental process. This suggests that our analyses should be framed in a within-person approach that examines how the process of flow unfolds within individuals across time. Likewise we have presented the utility of the NDS approach for studying the dynamic behavior of flow over time, emphasizing chaotic dynamics
and catastrophic changes as two fruitful concepts that may contribute to the development of a new mind-set for understanding work-related flow as a highly dynamic process. This section will be focused on the implications that the incorporation of this new mind-set, framed in the NDS approach, can have for the work developed by flow scholars and practitioners.

**Implications for flow research: NDS methodologies for analyzing within-person data**

Since the 1970s, the methodologies of NDS and their applications to social research have exploded (Guastello & Gregson, 2011). Specialist journals (e.g., nonlinear dynamics, psychology, and life sciences) and books (e.g., Guastello & Gregson, 2011; Heath, 2000; Kaplan & Glass, 1995) provide us with methods and applications of the behavioral sciences that are useful for studying the intricate and constantly changing nature of flow. In this sense, as flow scholars, we have in our hands an array of useful methodologies that can help us examine flow data with new lenses. In this section we will suggest a step-by-step basic procedure for assessing and modeling intraperson dynamics in time-series data. It is important to emphasize that the methodologies described here require a minimum set of data. For example, we have worked with at least 100 observations taken over time for each of the individuals being studied. However, with a minor amount of registers (thirty or forty) some of the techniques that we have used can be applied. In any case, the longer the time series, the better the accuracy of the results.

Likewise, it is important to note that using NDS methodologies does not mean that we should throw away all that we know about flow. Instead, it indicates a remarkable opportunity to go beyond what we already know about work-related flow and build on new models from variables we know well, incorporating nonlinear dynamics. Up until now the traditional linear approaches, grounded on the generalized linear model (GLM), have considered nonlinear dynamics as random noise. Likewise, although our approach in the present chapter is quantitative, qualitative designs using an NDS approach are also feasible, and several organizational behavior scholars are actively involved in performing qualitative studies from an NDS approach (e.g., Langley, Smallan, Tsoukas, & Van den Ven, 2013).

In Figure 5.3, a procedure of time series analyses using NDS methodologies that has been used in several studies (e.g., Ceja & Navarro, 2009, 2011, 2012; Arrieta et al., 2008; Ramos-Villagrasa & García-Izquierdo, 2011) is described. The process starts by producing line graphs of flow indexes against time for each participant separately (see first column in Figure 5.4). This will give us a within-subject perspective that will enable us to observe the presence or absence of regular patterns in the dynamics of flow over time. Visual inspection of flow indices against time is helpful to describe the dynamics of time series and it is needed before attempting more complicated analyses (Chatfield, 1996). For those participants for whom this preliminary visual inspection shows that their time series are mainly linear or nearly linear, a traditional approach based on the GLM is recommended (e.g., ARIMA
FIGURE 5.3 Procedure of time series analyses used in the study (adapted from Ramos-Villagrasa & García-Izquierdo, 2011)

models). However, for those cases where the line graphs show instable or nonlinear dynamics and it is challenging to discriminate between linear and nonlinear behavior, the use of NDS methodologies is advised.

Once we have visually assessed the nature of our time series and we detect unstable dynamics, we can go further and conduct a deeper analysis of patterning of
FIGURE 5.4 Line graphs (left) and recurrence plots (right). The top row shows a linear dynamic, the middle row a chaotic dynamic, and the lower row shows a random dynamic pattern. Adapted from Ceja & Navarro (2011)
trajectories, the paths defined by each participant’s data set, allowing us to uncover the dynamic patterns (e.g., linear, chaotic, or random) underlying the time-series data. In this chapter we will describe three NDS techniques that assess dynamic patterns in time-series data: maximum Lyapunov exponent, recurrence analysis, and surrogate data testing. In our view the three techniques presented here should be used together so the researcher can achieve a more precise examination of the intra-individual variability of flow (as chaotic, linear, or random), by integrating results from the three techniques.

The maximum Lyapunov exponent is a quantitative indicator of the dynamic patterns underlying time series. The Lyapunov exponent is based on a concept of entropy, which is the rate at which information that allows forecast of a variable $y$ is lost (Kaplan & Glass, 1995). In the case of a linear pattern, the maximum Lyapunov exponent is zero or less; otherwise, it could be chaotic or random. However, it is important to note that the Lyapunov exponent can overestimate chaos because for some cases it is not sensitive enough to discriminate between chaos and random behavior. In the cases of random patterns, Lyapunov exponents become very large, and this may be an indicator of random patterning in the data. Likewise, finding a pure linear pattern in a time series is very unlikely, increasing the risk of accepting a case as nonlinear when it is actually following a linear pattern. In order to continue our analysis further we suggest using also recurrence plots. Lyapunov exponents can be calculated in R using fNonlinear or RTisean packages.

The recurrence analysis is based on the study of possible recurrences in a time series. A recurrence is a sequence of events that repeats itself across time (Marwan, Romano, Thiel, & Kurths, 2007). The NDS offers a powerful tool for the characterization of recurrence called recurrence plots. A recurrence plot is a square matrix, in which the matrix elements correspond to those times at which time-series data recur (columns and rows indicate a certain pair of times). More specifically, the recurrence plot reveals all the times when the phase space trajectory of the data visits roughly the same area in the phase space (Heath, 2000). The recurrence plot enables us to characterize the dynamic underlying the time-series as linear, chaotic, or random. A free and useful software for applied recurrence plots is included in the fNonlinear package in R.

In Figure 5.4 we show line graphs (left) and recurrence plots (right) of flow data obtained from the study by Ceja and Navarro (2011). The first row of figures represents a linear dynamic; in this type of dynamic the recurrence plot shows an image in which all the data points are clearly concentrated in a few specific areas. This can be interpreted as the system passing several times through the same positions, which indicates that the dynamic is very regular and stable.

The middle row represents a chaotic dynamic; in this case the recurrence plot exhibits a uniform tone of upward marked diagonals called “recurrences” parallel to the main diagonal. These recurrences are sequences of values that are repeated within the system in a similar way at different periods of time that characterizes a chaotic time series. The last row represents a random dynamic; in this case any result is possible and many points appear across the graph. There is a lack of structure,
showing the absence of any recurrence. Although the visual recurrence approach is very useful, it presents an important challenge: the visual interpretation of recurrence plots requires some experience and for some cases it may be difficult to distinguish between random and chaotic dynamic patterns; hence the decision-making can be very subjective.

Both Lyapunov exponent and recurrence analysis enable scholars to perform a preliminary discrimination between linear, chaotic, or random patterns underlying time series. Nevertheless, it is important to use a third quantitative technique to clarify further the dynamic pattern underlying the time series. This third technique is called surrogate data analysis (Schreiber & Schmitz, 2000). Surrogate data analysis is used to verify the randomness of time series. The logic behind the surrogate data is very simple: starting from the original time series, this procedure enables the creation of random series, which conserve the same statistical properties (e.g., mean, variance, and structure of auto-correlation) as the original series, but remove nonlinear dependency (Kugiumtzis, 2002). Afterwards, a hypothesis contrast is conducted between the original series and the surrogate data, with the objective of ruling out that the original time series is also random (see Heath, 2000). The procedure is implemented in the TISEAN software (surrogates command) now also available in R (RTisean package). Readers interested in learning more about the basic concepts behind the surrogate data analysis are advised to review the work by Dolan and Spano (2001) and Heath (2000).

After carefully assessing the nature of the intra-individual variability using line graphs, Lyapunov exponent, recurrence analysis, and surrogate data analysis, for those cases in which the dynamic pattern is characterized as nonlinear or chaotic, a further step can be to develop dynamic models to match the empirical data. This is an area where there is a good deal of room for fruitful research on work-related flow. In this sense, catastrophe theory approach has been extensively applied in the social sciences (Bigelow, 1982; Guastello, 1995; Guastello, Gershon et al., 1999) and more recently in work-related flow (Ceja & Navarro, 2012) for modeling the discontinuities in nonlinear or chaotic data. To analyze the fit of the cusp catastrophe model to the flow data there are several powerful techniques available to flow scholars, such as the multivariate GEMCAT (see Lange, McDade, & Oliva, 2001; Oliva, Desarbo, Day, & Jedidi, 1987) or the polynomial regression technique (see Guastello, 1982, 1987). Nonetheless, we recommend using the R cusp package (Grasman, van der Maas, & Wagenmakers, 2009). This method implements and extends Cobb’s maximum likelihood approach (Cobb & Watson, 1980; Cobb, Koppestein, & Chen, 1983) and makes it easy to fit the cusp catastrophe model to real flow data and compare it with linear and logistic regression models. It is important to note that considering the nonergodic nature of flow data, the fit of each model (i.e., cusp catastrophe, linear, and logistic) should be done individually for each study participant (i.e., case per case).

Summing up, results of preliminary visual explorations using line graphs can serve us to verify the stability of flow over time. Subsequently, if our data shows unstable behavior across time, NDS techniques, such as Lyapunov exponent, recurrence
Redefining flow at work

analysis, and surrogate data analysis, can help us to determine the type of dynamic pattern (i.e., linear, chaotic, or random) underlying the flow data and select the most suitable methodology for modeling our data. More specifically if the data shows linear behavior we can use more traditional linear approaches, such as ARIMA models or other related ones. However, if the flow data behaves in a nonlinear manner, flow scholars can use NDS modeling techniques, such as catastrophe models. Finally if the data shows random behavior, no modeling of the flow data can be conducted.

Overall, flow can be considered a nonergodic process; thus, it is better studied using person-specific dynamic models. In this sense, techniques based on NDS can help flow scholars to incorporate in their research the nonlinearity and discontinuous change that employees experience in their everyday struggle of transitioning between nonflow states (e.g., boredom or anxiety) and the flow state. It is important to emphasize that between-subjects designs can also be used; however, they should be based on the intra-individual analysis of single cases. For instance, flow scholars can study clusters of participants presenting different dynamic patterns (e.g., linear, chaotic, or random). In a study on work-related flow, Ceja and Navarro (2011) found that high levels of flow are associated with the chaotic pattern, whereas other states of consciousness are associated with linear and random patterns. Future research on flow can continue this line of research and examine the variables associated with the emergence of different dynamic patterns in flow at work. We are hopeful that new developments in the study of flow at work will have more widespread applications of NDS-based methods.

**Implications for practitioners: incorporating nonlinear dynamics of flow to organizational practice**

A growing number of organizations are aligning work and culture with the principles of flow, considering the main tenets of the flow theory to create working conditions that allow their employees to experience flow (e.g., balance between challenges and skills, clear goals, unambiguous feedback, autonomy, space for deep concentration). Some examples are Microsoft, Gallup, Ericsson, Media-Saturn Group, Patagonia, and Toyota, which have discovered that creating a flow-friendly work environment that helps individuals flourish can increase productivity and satisfaction at work (Pink, 2009).

Csikszentmihalyi (1996) argues that without flow there is no creativity, and in today’s business world, innovation and creativity are a requirement to succeed. “To stay competitive, we have to lead in the world in-person creativity. People with high flow never miss a day. They never get sick. Their lives are just better and they are more productive,” says Jif Clifton, CEO of the Gallup Organization. Cheng and Van de Ven (1996) found that the creative processes in organizations exhibit chaotic patterns. In other words, learning in chaotic conditions is an expanding and diverging process of discovering possible action alternatives, while learning under stable periodic conditions is a narrowing and converging process. Hence, it appears that flow and creative processes emerge under chaotic conditions, meaning that
instability and variability in organizational contexts can be regarded as flow-friendly work conditions.

Utho Creusen, former chief human resources officer of Media-Saturn Group, received an excellence in practice award by the Gallup International Positive Institute in 2006 for institutionalizing concepts of flow in his company. Utho explains that opportunity and freedom within a work role are needed to experience flow. This is difficult when roles conform to a standardized template. Hence, it is important to allow some flexibility within roles no matter how structured the working environments. It is always important that individuals have certain degree of flexibility to be able to craft their jobs.3

Likewise, at Patagonia, former CEO Michael Crooke argues that the experience of flow can be extended from the Patagonia workforce to all stakeholders if they derive a joyful experience from the company (Perschel, 2010). Crooke implemented an annual company assessment to measure the degree of work-related flow employees experience in their daily activities, including items such as how free employees are to use their own time (sense of control), whether they experience a balance between their job demands and their skills (challenge-skill balance), and whether they are able to stay focused in one task at a time (deep concentration). Crooke has been celebrated for building Patagonia into one of the world’s most recognized, successful, and socially responsible brands (Persche, 2010).

Stefan Falk, former vice president at Ericsson, adopted flow concepts to engage employees at his company (Pink, 2009). Impressed by the results, Falk developed a flow-based culture in 2003 when he joined Green Cargo, one of Scandinavia’s largest transport and logistics companies. At Green Cargo, Csikszentmihalyi’s book on flow is required reading for all managers as part of a training program. With the objective of establishing clear goals and unambiguous feedback (two of the antecedents of flow), employees and managers meet and negotiate three-month contracts and organize feedback sessions once a month. A year following this implementation, Green Cargo substantially increased its profits (Pink, 2009).

Another example of how companies use the flow theory to enhance the experience of their clients is Microsoft applying the concepts of flow to give Windows users a more engaging and joyful experience. Its objective is to make its products a pleasure to use. Likewise, Microsoft is currently conducting research on how flow might improve the lives and productivity of software engineers (Pink, 2009).

As we have seen in the foregoing examples, enhancing work-related flow can be neither costly nor difficult for organizations. For instance, monitoring the flow experiences of employees to develop person-specific interventions to enhance flow at work may be really powerful. NDS methodologies can give practitioners a more dynamic view of flow, where variability and abrupt changes are seen as a positive and healthy behavior. In this sense, practitioners should be careful with employees who show stable dynamics of flow (e.g., they never enter the flow zone or they never leave the flow zone), as stable dynamics appear to be associated with low levels of flow at work (e.g., Ceja & Navarro, 2011).
Likewise, as we have shown throughout the chapter, practitioners can benefit from the NDS approach for understanding work-related flow as a dynamic and unique process that is different for each individual. This should be viewed as a fundamental management tool, and can guide organizations in the creation of individual-specific interventions that consider the dynamic pattern of each individual (chaotic, random, or linear) and the characteristics of the work context. With this information in mind, designing individual job positions or entire work environments following the concept and dynamics of flow will likely result in higher well-being for all stakeholders in organizations.

Conclusions

Our conclusions can be framed in three main “take-home” messages. First, flow should be considered a nonergodic process, meaning that we need to study it at the intra-individual level of analysis. Once we can describe the dynamic of flow at the intra-individual level, we might be able to group individuals in clusters following same dynamic patterns.

Second, flow should be considered a nonlinear process. This means that we need to study it going beyond the techniques that the generalized linear model provides us with. More specifically, we should apply nonlinear techniques to obtain better results in our research.

Finally, flow should be present in the agenda of managers and human resource professionals. The experience of flow represents one of the purest manifestations of intrinsic motivation, and motivation is a key determinant of performance at work. Additionally, intrinsic motivation enhances employee well-being. One of the classic paradoxes for human resource professionals is taking care of employee motivation and well-being while enhancing organizational productivity – this can be managed by paying attention to the dynamics of flow at work. Definitely, taking care of employees’ flow is a serious business.

Notes

1 In Ceja and Navarro (2009) two flow measures were used: measure 1 was the balance of challenges and skills, and measure 2 involved the average of enjoyment, interest, and absorption.
3 Personal interview with Utho Creusen at the Gallup Positive Psychology summit, 2008.

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Introduction

The concept of flow in organizational settings is receiving an increasing amount of attention from researchers, most of their studies being focused on modern organizations. One of the reasons for this growing interest is the driving force of positive psychology, which can be defined as the scientific study of optimal human functioning, the aim of which is to build positive qualities – that is, virtues and strengths (Seligman & Csikszentmihalyi, 2000, p. 5). Specifically in the work context, positive organizational psychology (POP) is conceptualized as the scientific study of the healthy and optimal functioning of persons and groups in the organizations, as well as the effective management of psychosocial well-being at work and the development of healthy organizations. Its objective is to describe, explain, and predict the optimal functioning in these contexts and to amplify and potentiate the psychosocial well-being and the quality of job and organizational life (Salanova, Martínez, & Llorens, 2005, 2014). This positive approach has yielded interesting findings about positive psychosocial emotions and experiences, such as flow, in work contexts (Bakker, 2005; Llorens, Salanova, & Rodríguez, 2013; Salanova, Bakker, & Llorens, 2006).

Previous research on flow at work has made it possible to identify different key aspects related to the concept, theoretical models, and measurement. Accordingly, research has identified: (1) the dimensionality of flow experiences at work; (2) the distinction between flow experiences and their prerequisites; and (3) the differences in the frequency of flow experience among occupations (see, e.g., Llorens et al., 2013).

In this chapter, we provide an overview of the main research that has investigated the organizational and individual consequences of flow at work. In particular, we will discuss the impact of flow on well-being, other personal and job resources, and job performance. We will also outline research that has investigated
the relationship between flow and well-being and the contribution that flow at work can make to the emerging field of positive organizational behavior.

**What is flow at work?**

**About the concept of flow at work**

Traditionally, flow has been described as an experience occurring while performing any activity that makes people feel good and motivated because they are doing something worthwhile for its own sake. However, this concept has been improved so as to adapt it to other contexts, such as art, sports, daily activities, leisure, or study (e.g., Csikszentmihalyi, 2003; Csikszentmihalyi & LeFevre, 1989; Delle Fave & Bassi, 2000; Delle Fave & Massimini, 2005). Adapted to these contexts, flow “tends to occur when a person’s skills are fully involved in overcoming a challenge that is just about manageable. Optimal experiences usually involve a fine balance between one’s ability to act and the available opportunities for action” (Csikszentmihalyi, 1997, p. 30).

The application of the concept to work settings reveals that, of course, flow could be experienced there in a similar manner. In work settings, flow is conceptualized as an optimal experience that is characterized by three structural dimensions: enjoyment (i.e., the emotional component), absorption (i.e., the cognitive component), and intrinsic interest (i.e., the motivational component).

Focused on work, enjoyment refers to a positive judgment about (Bakker, 2008) the quality of working life (see also Veenhoven, 1984). The state of being fully concentrated and engrossed in one’s work, whereby time passes quickly and one has difficulties detaching oneself from work, characterizes absorption (Ghani & Deshpande, 1994; Lutz & Guiry, 1994; Moneta & Csikszentmihalyi, 1996). Intrinsic interest refers to the need to perform a certain work-related activity with the aim of experiencing inherent pleasure and satisfaction in it (cf. Deci & Ryan, 1985; Moneta & Csikszentmihalyi, 1996; Trevino & Webster, 1992). Intrinsically motivated employees are continuously interested in the work they are involved in (Harackiewicz & Elliot, 1998), and they want to continue their work and are fascinated by the tasks they perform (Csikszentmihalyi, 1997) (for a recent review see Llorens et al., 2013).

A great deal of empirical research has found this three-dimensional structure of flow at work, which is characterized by enjoyment, absorption, and intrinsic interest, in different samples of workers, such as teachers (Bakker, 2005; Salanova et al., 2006), employees of small and medium-sized companies (Demerouti, 2006), and line managers (Nielsen & Cleal, 2010), as well as information and communication technology users (students and workers; Rodríguez, Schaufeli, Salanova, & Cifre, 2008). Despite this consistence, research has pointed to the existence of just two (enjoyment and absorption) rather than three dimensions of the flow experience at work (Ghani & Deshpande, 1994; Rodríguez, Cifre, Salanova, & Áborg, 2008; Skadberg & Kimmel, 2004). For example, multigroup confirmatory factor analyses
(MCFA) provided evidence that flow experience is composed of only two related but different dimensions — namely, enjoyment and absorption — in different work settings (tile workers and secondary school teachers, Llorens et al., 2013), tested by the WOLF Inventory (Bakker, 2001). The two-dimensional model fitted the data better than the three-dimensional one.

A model of flow at work

If there is some mismatch as regards the dimensionality of flow in work contexts, another relevant question refers to the conditions needed to promote flow at work. Although originally there was some confusion about the experience of flow and its prerequisites (Csikszentmihalyi, 1975, 1990, 1997), researchers are now aware of the need to distinguish the flow experience itself from its prerequisites and its consequences (Bassi & Delle Fave, 2012b; Chen, Wigand, & Nilan, 1999; Guo & Poole, 2009; Kawabata & Mallett, 2011; Keller & Bless, 2008; Keller & Blomann, 2008; Mesurado, 2009; Pearce, Ainley, & Howard, 2005). Applied to work contexts, the model of flow at work emerges as an alternative allowing us to differentiate between the experience and the antecedents of flow at work (Llorens et al., 2013).

Based on the flow channel model (Csikszentmihalyi, 1975) and the experience fluctuation model (EFM) developed in previous studies (e.g., Csikszentmihalyi & Csikszentmihalyi, 1988; Delespaul, Reis, & de Vries, 2004; Delle Fave & Bassi, 2000; Delle Fave & Massimini, 2005; Eisenberger, Jones, Stinglhamber, Shanock, & Randall, 2005; Massimini, Csikszentmihalyi, & Carli, 1987), this model of flow in work settings assumes that employees would experience flow more frequently when their job demands are perceived as highly challenging, but they also believe that they have the skills to cope with the demands (Llorens et al., 2013). Specifically, the model of flow at work assumes that the flow experience at work is a subjective experience. The model replicates the EFM by identifying eight areas (“channels”) which represent eight experiences (i.e., arousal, control, relaxation, boredom, apathy, worry, anxiety, and flow). Like in the EFM, in this model flow is characterized by the perception of high challenges and high skills in terms of intensity. In line with the previous models, in this model of flow at work, high levels of perceived skills and high levels of perceived challenges are necessary prerequisites to experience flow (Salanova et al., 2006). Thus workers who, regardless of their occupation, perceive a balance between high levels of challenge and skills in their jobs, experience flow more frequently than others who perceive different combinations between challenge and skills (for more details, see Llorens et al., 2013).

The measurement of flow at work

The study of flow at work has an important tradition. Some studies have investigated flow at work by evaluating the intensity of antecedents and experiential components using the experience sampling method (ESM; Csikszentmihalyi & LeFevre, 1989; Delle Fave & Massimini, 2005) and the Flow Questionnaire
The consequences of flow

(Bassi & Delle Fave, 2012a). Another approach is based on single-administration retrospective instruments, which test frequency rather than intensity of flow and its prerequisites (see Bakker, 2001, 2008; Mäkikangas, Bakker, Aunola, & Demerouti, 2010; Salanova et al., 2006).

To this purpose, Bakker developed an instrument to assess the experience of flow at work, the so-called WOrk-reLated Flow inventory (WOLF; Bakker, 2001, 2008). This single-administration retrospective instrument allows for assessing the frequency of the flow experience over the last six months on a seven-point scale from 0 (“never”) to 6 (“every day”). The sixteen items test the three dimensions of the flow experience at work, — that is, enjoyment (four items), absorption (six items), and intrinsic interest (six items). Lately, a short form of WOLF was developed, with ten items referring to the dimensions of enjoyment (four items), and absorption (six items) (see Llorens et al., 2013).

Consequences of flow at work

In addition to the experience, prerequisites, and measurement of flow at work, there is also empirical evidence regarding the consequences of flow at work. Although fewer studies were conducted on this aspect, in the following pages we outline the most significant consequences of flow at work, which we have classified into three main categories: well-being, resources, and job performance.

How does flow enhance well-being at work?

Different research studies have highlighted the relevance of flow in the development of well-being at work. Generally speaking, results give evidence for the direct and positive impact of flow on subjective well-being “by fostering the experience of happiness in the here and now” from a hedonic perspective (Moneta, 2004, p. 116). We consistently found that flow is positively related to subjective well-being and positive emotions (Bloch, 2002), positive mood (Fullagar & Kelloway, 2009), active coping and commitment (Salanova, Martínez, Cifre, & Schaufeli, 2005), less burnout (Lavigne, Forest, & Crevier-Braud, 2012), task engagement (Ainley, Enger, & Kennedy, 2008), job satisfaction (Maeran & Cangiano, 2013), and high energy levels (Demerouti, Bakker, Sonnentag, & Fullagar, 2012).

Specifically, a phenomenological analysis of interviews carried out on a sample of thirty-six employees of a public organization highlighted that flow experiences are associated with a good quality of life in modern everyday existence (Bloch, 2002). Accordingly, flow “appeared as pervasive states coloring the interviewees’ world of action, feeling and thinking. These states were characterized by specific experience of reality, of self and of time” (p. 120). In this context flow plays the role of a framework for the development of more positive and specific emotions and feelings, such as joy, ecstasy, excitement, happiness, and pride.

Similarly, in a longitudinal study aimed at investigating the experience of forty architecture students by means of ESM over a semester, hierarchical linear modeling
showed that flow is related to subjective well-being and positive mood (Fullagar & Kelloway, 2009). More specifically, students who experienced higher values of flow in terms of intensity reported being momentarily in a more positive mood in terms of hedonic well-being.

In another study conducted on 770 workers from different occupational sectors (education, production sectors), higher frequency of the dimensions of flow (higher perceived competence, absorption, and intrinsic satisfaction) was related to the perception of a more positive environment, psychosocial well-being, and reduced ill-being. More specifically, flow at work was positively related to the perception of more job resources at work (i.e., autonomy, feedback, and task variety) and psychosocial well-being in terms of active coping and organizational commitment, but negatively related to burnout (exhaustion and cynicism) and anxiety. Workers who experience flow at work more frequently therefore seem to perceive a better job context with more job resources and experience better well-being – that is, a greater frequency of active coping behaviors, more commitment to the organization, and lower levels of burnout and anxiety related to the task (Salanova, Martínez, Cifre, et al., 2005).

Flow has also been negatively related to burnout in two independent studies on Canadian workers (Lavigne et al., 2012). In Study 1, a cross-sectional design and path analysis were used with 113 young workers to show the mediating role of flow at work between harmonious passion and burnout, especially in the dimensions of inefficacy and cynicism. Results suggested that the more harmonious passion is reported at work, the higher frequency of flow is experienced. As a consequence, less burnout (i.e., cynicism and inefficacy) is observed. In the second longitudinal study with 325 participants working for the Quebec government, harmonious passion for work was positively related to flow experiences at work as reported six months later and after controlling for Time 1’s flow experiences (in terms of concentration, control, and autotelic experience’s intensity). Thus, flow experiences at work at Time 2 were negatively related to inefficacy, cynicism, and emotional exhaustion at work at Time 2. That is, the more flow is experienced in terms of intensity, the less burnout is found.

Applied to the learning context, a study with a preprofessional sample of secondary school students aged between fifteen and eighteen years showed that higher ratings of challenge and skill are positively related to another indicator of well-being: task engagement (Ainley et al., 2008). Results showed that flow groups experienced, as a consequence, more engagement and focusing throughout the task compared to the non-flow groups working on a short learning activity – that is, a writing task using an interactive computer program called “Between the Lines.”

Satisfaction at work (as a measure of well-being) has also been claimed to be a consequence of flow at work. Maeran and Cangiano (2013) developed a model of flow where this psychological state was considered critical in redesigning interventions in the workplace in order to promote job satisfaction. Their results showed the strong impact of flow as a key predictor of job satisfaction.
Another diary study examined the moderating role of both recovery efforts at work (i.e., a process that repairs the negative effects of strain) and detachment from work in the relationship between flow experience at work and energy perceived when the work is finished (Demerouti et al., 2012). In a sample of eighty-three participants, multilevel analyses revealed the benefits of flow for (1) increasing the energy after work when employees failed to recover during work breaks, and (2) increasing the levels of vigor in the employees at the end of the day when they left the workplace. Generally speaking, flow is a positive experience that produces benefits for employees’ well-being. The impact of flow is a key element for employees’ levels of energy after work and at the end of the day when at home, particularly the dimensions of enjoyment and absorption (Demerouti et al., 2012).

To sum up, taking into account research about the positive effects of flow on well-being and following the ‘broaden-and-build theory’ (Fredrickson, 2001), we suggest, by analogy with positive emotions, that flow produces this positive effect since (1) it allows people to broaden their momentary thought–action repertoires and build resilience (Fredrickson, 1998, 2001; Fredrickson & Branigan, 2005), and (2) in a similar way to positive emotions, flow could regulate negative emotions (Fredrickson, Mancuso, Branigan, & Tugade, 2000) and foster positive spirals of well-being (Fredrickson & Joiner, 2002).

Flow and other personal and job resources

Further expanding the analogy with Fredrickson’s broaden-and-build theory, flow states could generate more positive resources at work (i.e., personal and job resources) through different kinds of positive spirals, such as the emotional contagion of flow (Bakker, 2005), organizational climate and efficacy beliefs (Salanova et al., 2006), social support, opportunities for professional development, supervisory coaching (Mäkikangas et al., 2010), and finally flow prerequisites – that is, challenge and skills over time (Rodríguez, Salanova, Cifre, & Schaufeli, 2011).

In a similar line, a study on a sample of music teachers and their students (Bakker, 2005) provided evidence in favor of the emotional contagion of the flow experience. Specifically, a positive relationship between the frequency of music teachers’ flow experiences and the frequency of flow among their students was detected. It seems that “this flow contagion occurs because of the automatic imitation of cheerful and happy teachers, but also the more conscious crossover of teachers’ dedication to their work.” Hence, one of the consequences of flow is that flow causes flow (Bakker, 2005, p. 38).

Furthermore, there is a large body of research that shows reciprocal effects between job and personal resources and flow, thereby suggesting the development of positive cycles or spirals. In fact, these studies offer evidence in favor of the notion that job resources and flow mutually influence each other: resources enhance flow, but flow also promotes job resources. The positive relationships of flow with organizational and personal resources at work emerged in a longitudinal study with secondary school teachers (Salanova et al., 2006). More specifically, results showed
a reciprocal influence between the flow experience and organizational resources (in terms of climate orientation indicators, such as social support, innovation, rules, and goals) and personal resources (i.e., efficacy beliefs) over time. That is, organizational and personal resources tested at the beginning of the academic year (Time 1) facilitated work-related flow at work eight months later, at the end of the academic year (Time 2). Findings also showed that the frequency of flow (i.e., frequency in absorption, enjoyment, and intrinsic work motivation) at work tested at Time 1 had a positive influence on personal and organizational resources at Time 2. In fact, this study showed that flow develops over time when personal and organizational resources are available, and also that the experience of flow in the present influences the gaining of organizational and personal resources in the future by generating a positive spiral over time.

Similarly, a longitudinal study conducted over three months on 335 employees from an employment agency based on latent growth curve and mixed model analyses showed that job resources (i.e., social support, opportunities for professional development, and supervisory coaching) were positively related to flow at work. Thus, these findings suggest that: (1) the frequency of job resources and flow are positively related to each other over time, and (2) their changes over time again provide evidence for mutual cycles of change (Mäkikangas et al., 2010).

These reciprocal relationships were also detected between flow and its prerequisites – that is, challenge and skills – over time. In a two-wave longitudinal study conducted among 258 secondary school teachers, results showed that the flow experience was a consequence and also an antecedent of perceived challenge and skills (Rodríguez et al., 2011). More specifically, the higher the frequency of prerequisites (perceived high challenge and skills) of flow at Time 1, the higher the frequency of flow over time, which in turn increases the frequency of the prerequisites (high challenge and skills) in a positive cycle.

**Flow as a driver of performance**

The fact that flow plays a key role across life domains (for a review see Delle Fave, Massimini, & Bassi, 2011; Massimini & Delle Fave, 2000) and in the development of well-being and resources is clear, but there is also empirical evidence that flow could enhance positive results in terms of performance, such as organizational spontaneity (Eisenberger et al., 2005), in- and extra-role performance (Bakker, 2008), creative performance (MacDonald, Byrne, & Carlton, 2006; Yan, Davison, & Mo, 2013), service quality (Kuo & Ho, 2010), and group performance from a collective point of view (Admiraal, Huizenga, Akkerman, & Dam, 2011; Aubé, Brunelle, & Rousseau, 2014; Bakker, Oerlemans, Demerouti, Slot, & Ali, 2011).

However, some studies suggested that the association of flow with greater positive mood and higher performance specifically emerged among workers reporting a high need for achievement (Eisenberger et al., 2005). A study conducted among sales employees and sales support employees revealed that employees in the flow context (high values of both skills and challenges) experience greater positive mood
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(e.g., the extent to which workers felt happy at work) and organizational spontaneity (e.g., the extent to which employees looked for ways to improve the effectiveness of their work) than other combinations of skill and challenge only when employees have a high need for achievement (i.e., achievement orientation, such as working to improve one’s skills and desiring frequent feedback).

On the other hand, in a study of 1,346 employees distributed in seven samples from different occupational groups and companies, flow experience was related to job satisfaction, and to job performance in its two dimensions: in-role (i.e., formal work performance) as well as extra-role (i.e., behavior that exceeds normal task fulfillment by going the extra mile) performance. In this respect, it seems that happy employees who get “into the flow” at work are also more satisfied and perform better in their role and extra-role behaviors (Bakker, 2008).

Flow has also been connected to a specific type of performance, namely creative performance. Flow is an experience of an activity as being intrinsically rewarding, under which “individuals tend to be curious, cognitively flexible, willing to take risks, and persistent in the face of barriers – characteristics that should facilitate the development of new and potentially useful ideas” (Baera, Oldhama, & Cummings, 2003, p. 571). To evaluate these aspects, a study was carried out among forty-five university students who worked on a group composition task during three meetings (MacDonald et al., 2006). The completed compositions were recorded and rated for quality and creativity by the participants and by a group of twenty-four specialists in music education. Using an Experience Sampling Form (ESF; Csikszentmihalyi & Csikszentmihalyi, 1988) the results showed that as group flow increased, so did the rating for creativity given by the specialists. Also, specialists rated the compositions of those groups that experienced higher values of flow more positively than those provided by the groups who experienced lower values of flow.

Data collected from 232 users of Web 2.0 virtual communities were used to test a model where the flow experience (i.e., perceived enjoyment and attention focus) mediates the relationship between knowledge sharing behavior (i.e., knowledge seeking and knowledge contributing) and employee creativity at work (Yan et al., 2013). Findings showed that both types of knowledge behaviors can lead to a state of flow and can further result in creativity at work.

Group flow and group performance have also been studied, and the results are consistent with those obtained for individual contexts. In a study involving eighty-five teams of college students who participated in a project management simulation, flow predicted 12% of the variance in team performance, and this relationship was fully mediated by members’ commitment to team goals (Aubé et al., 2014). Furthermore, the exchange of information among the members played a crucial role in increasing team performances. Specifically, the more team members communicated while doing their work, the stronger the relationship between flow and team performance.

In another study on collective measures, results from structural equation modeling in a two-wave longitudinal lab on 250 participants working in fifty-two groups showed that collective efficacy beliefs predict collective flow (tested in terms of
frequency) over time in a reciprocal relationship. These results highlighted the role of collective flow in increasing collective efficacy beliefs in a gain cycle over time (Salanova, Rodríguez, Schaufeli, & Cifre, 2014).

Another study, combining survey and experimental methods where participants played a paddleball game, gave evidence for the impact of collective flow. Results showed that social flow experiences were perceived as more enjoyable compared to solitary flow experiences. Specifically, participants who played in interdependent teams reported more joy in flow than individuals performing less interdependently or alone (Walker, 2010).

Finally, a positive relationship between team flow and team performance was detected among soccer teams (Bakker et al., 2011). Multilevel analyses revealed that environmental resources (autonomy, social support from the coach, and performance feedback) were positively related to flow, which in turn was positively related to the performance of each player in the team during the match. These findings suggest that certain characteristics of flow at the team level (in terms of transformation of time, clear goals, autotelic experience) appear when the match results in a draw or is won than when the match is lost. Furthermore, results showed that performance feedback and support from the coach predicted flow during the soccer game, which in turn was positively related to self- and coach-ratings of performance.

Conclusions

The main aim of this chapter was to provide an overview of the research investigating the organizational and individual consequences of flow at work. Specifically, the chapter discussed the impact of flow on well-being, resources, and job performance. The relationship between flow and well-being and the contribution that flow at work can make to the emerging field of positive organizational behavior were also addressed. Throughout the chapter we have summarized the state of the art of the concept, models, and measurement of flow at work according to recent research in the field. There is empirical evidence in favor of the idea that investing organizational and job resources is the key to enhance flow at work and consequently to achieve higher well-being, more resources, and better performance. Different positive consequences of flow have been shown to be mainly oriented toward these three aspects.

The main conclusions of the chapter are the following: (1) the concept of flow as an optimal experience can be transposed in the work contexts, within the theoretical framework of positive psychology at work; (2) the model of flow at work, which assumes that flow is experienced when high challenges and skills are perceived, constitutes a reliable way to differentiate between the experience and the antecedents of flow at work; (3) the WOLF inventory is one way to test flow at work where frequency rather than intensity of flow is tested to capture the essence of flow at work; (4) flow is positively related to subjective well-being and positive emotions, positive mood, active coping, commitment, task engagement,
job satisfaction, energy levels, and the good life in modern everyday existence; (5) through positive cycles, spirals, or emotional contagion, the flow experience also enhances the perception of more positive (personal and job-related) resources at work; particularly, flow is positively related to organizational climate, task and social resources, efficacy beliefs, and also more flow (flow causes flow); (6) flow is also responsible for the development of performance in terms of organizational spontaneity, in- and extra-role performance, creative performance, service quality, and group performance, and (7) finally, recent research gives evidence in favor of the relevance of social (or collective) flow.

These are the main contributions of this chapter dealing with the consequences of flow in work settings. We plan to further expand our research, focusing on ways to promote job environments that allow employees to experience positive experiences such as flow. This positive experience will foster other positive consequences at work – that is, employees’ well-being, better perceptions of job and personal resources in the work contexts, and better performance in a general way.

References


In the early 1970s, Mihaly Csikszentmihalyi interviewed surgeons, rock climbers, composers, dancers, chess players, and athletes, asking them to report their experience when they engaged in the most challenging phases of their preferred endeavors, and he reported the findings in the seminal book *Beyond Boredom and Anxiety* (1975/2000). The interviews produced a wealth of textual descriptions that, although coming from persons with different backgrounds and working in different domains, shared six main themes: (1) focused concentration on the present activity, with centering of attention on a narrow stimulus field (e.g., “When I start, I really do shut out the world”), (2) merging of action and awareness (“I am so involved in what I am doing . . . I don’t see myself as separate from what I am doing”), (3) loss of self-consciousness (e.g., “I am less aware of myself and my problems”), (4) sense of control over one’s own actions (e.g., “I feel immensely strong”), (5) unambiguous feedback from the activity (e.g., “You don’t feel you have all sorts of different kinds of demands, often conflicting, upon you”), and (6) autotelic experience — that is, the sense that the activity is an end in itself, and hence runs independently of external rewards (e.g., “The act of writing justifies poetry”). Csikszentmihalyi named flow the simultaneous enactment of these six themes, and set out to search for its origins and consequences. In the early 1990s, Csikszentmihalyi (1996) investigated through interviews the experiences that ninety-one outstanding individuals had prior to conceiving novel ideas and seeing them recognized by peers as innovations. Intense and recurrent flow at work emerged as the main theme underlying each innovation across the domains of science, art, and business.

In the past two decades, researchers in the fields of organizational psychology and management have increasingly focused on the occurrence of flow in the work context across a wide range of occupations and organizational contexts, including scientists (Quinn, 2005), medical doctors (Delle Fave & Massimini, 2003), software engineers (Debus, Sonnentag, Deutsch, & Nussbeck, 2014), and school teachers.
They identified important antecedents of flow at work, including individual difference components (e.g., Eisenberger, Jones, Stinglhamber, Shanock, & Randall, 2005), work environment characteristics (e.g., Mäkikangas, Bakker, Aunola, & Demerouti, 2010), and the additive or interactive effects of the two (e.g., Bakker, 2005; Moneta, 2012b; Salanova et al., 2006). Scholars also identified important consequences of flow at work, including enhanced employee psychological well-being (Debus et al., 2014; Fullagar & Kelloway, 2009) and enhanced job performance (e.g., Demerouti, 2006; Eisenberger et al., 2005), in general, and creative contributions to work (Csikszentmihalyi, 1996), in particular. These findings have raised interest among scholars, managers, and employees in the possibility of modifying the existing work environments and management processes to foster flow for individual workers, teams of workers engaged in a common work project, and entire organizations.

The present chapter focuses on the role of flow in organizations and the strategies organizations could adopt to redesign the work environment in order to foster their employees’ experience of flow at work. Because the research findings on flow do not translate directly and easily into applications, this chapter is exploratory in essence, and it highlights both the promises of the field and its most pressing unanswered questions. This chapter is divided into two parts. The first part outlines and critically reviews a selection of research on flow that is directly relevant to any organizational intervention. The second part outlines four promising strategies that organizations can adopt to foster their employees’ flow at work.

The nature of flow at work

Antecedents and indicators of flow

Although the core concept of flow remained stable since its inception, the models and operationalizations of flow that researchers developed changed substantially over time. In particular, there is still a lively debate on the number of distinct facets or dimensions of flow. On one extreme, Schiefele and Raabe (2011) described flow simply as absorption – that is, as a state of being deeply immersed in an activity. On the other extreme, Jackson and Csikszentmihalyi (1999) described flow as a state characterized by nine components. Six of them are the components that Csikszentmihalyi (1975/2000) identified from the onset of flow research and were listed at the beginning of this chapter: concentration, merging of action and awareness, loss of self-consciousness, sense of control, unambiguous feedback, and autotelic experience. The remaining three components emerged in more recent research: dynamic balance between challenge and skill, clear proximal goals, and loss of time-awareness or time acceleration. Other researchers adopted somewhat intermediate definitions of flow that include from three (e.g., Moneta, 2012a) to eight facets (e.g., Engeser & Schiepe-Tiska, 2012). These differences are important for any attempt to modify the work environment in order to enhance flow. In particular, the number of facets used to define flow determines the number of ultimate target variables for an
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intervention: only one based on Schiefele and Raabe’s (2011) definition of flow, up to nine based on Jackson and Csikszentmihalyi’s (1999) definition of flow.

A strictly linked and equally lively debate concerns the functional relation between the hypothesized components of flow. Jackson and Csikszentmihalyi (1999) have regarded the nine components of flow as correlated dimensions of the flow construct that can trade off in determining the intensity of flow. Other researchers have instead argued that only some of the nine components are indicators of flow — that is, experiences that can be caused by flow — whereas the remaining are antecedents of flow — that is, experiences that can cause flow. For example, Quinn (2005) proposed and tested a chained-mediation model of flow for knowledge workers in the field of national security in which flow is defined solely by the indicator of merging of action and application, whereas loss of self-consciousness and sense of control are defined as consequences of flow, and the remaining components of Jackson and Csikszentmihalyi’s (1999) taxonomy play various roles as antecedents of flow or other consequences of antecedents of flow. Several definitional models of flow have been proposed in recent years (e.g., Kawabata & Mallet, 2011; Moneta, 2012a). Hoffman and Novak (2009) identified and compared thirty definitional models of flow that various authors had proposed over the years, and concluded that what they all have in common is a distinction of characteristics of flow into the three categories of (a) antecedents of flow, (b) expressions of flow, and (c) effects of flow. In all, the separation of variables into indicators of flow and antecedents of flow is important for any attempt to modify the work environment in order to enhance flow. In particular, while the key indicators of flow — arguably, absorption and concentration — may not be intervened upon directly in organizational settings, at least some of the antecedents of flow appear to be appropriate target variables for organizational interventions.

The challenge-skill balance

The original flow model (Csikszentmihalyi, 1975/2000) posited that the flow state is more likely to occur and is more intense when there is an equivalent ratio of perceived challenges from the activity to perceived skills in carrying out the activity, and both variables are high. Empirical studies using the experience sampling method (ESM; Csikszentmihalyi & Larson, 1987; Csikszentmihalyi, Larson, & Prescott, 1977) have corroborated that perceived challenge and skill, and their relative balance, are the most robust predictors of flow (e.g., Massimini, Csikszentmihalyi, & Carli, 1987; Pfister, 2002), and particularly so in achievement contexts (e.g., Moneta & Csikszentmihalyi, 1996). Moreover, it was found that the effects of challenge, skill, and their balance are linked to personality traits, such as trait intrinsic motivation and interdependent self-construal (Moneta, 2004), and situational variables, such as goals, interests, importance of the activity, and state intrinsic motivation (Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005; Delle Fave & Massimini, 2005; Ellis, Voelkl, & Morris, 1994; Fong, Zaleski, & Leach, 2015; Inkinen et al., 2014; Rheinberg, Manig, Kliegl, Engeser, & Vollmeyer, 2007). Therefore, the perception of
challenges and skills when engaged in work tasks appears to be the core variables for organizational interventions aiming at fostering flow in the workplace.

The focus on challenges and skills may at first glance appear reductive. Yet, as Keller and Landhäußer (2012) argued, the other two flow characteristics that researchers have most often regarded as antecedents of flow – clear goals and immediate and unambiguous feedback – are implicitly incorporated in the construct of challenge-skill balance. Clarity of goals entails that the worker is given clear task instructions and understands the nature and structure of the task. Immediate and unambiguous feedback presupposes that the goals of the task are clear, and entails that the worker receives prompt and accurate diagnostic information on how fast his progress toward the goal is. As such, a worker can construe meaningful perceptions of the challenges from the task and the skills possessed to tackle them only if he has clear goals and receives accurate and prompt feedback on his actions. This argument strengthens the idea that workers’ perceived challenges and skills should be the primary target of organizational interventions.

The emphasis of flow theory is on perception of challenge and skill. What is the relationship between subjective and objective challenges and skills? Abuhamdeh and Csikszentmihalyi (2009, 2013) investigated variations in subjective experience while playing chess in expert chess players. Using objective measures of the ability and performance of chess players, these studies found significant but moderate relationships between subjective and objective challenges and skills. For example, the correlation between perceived challenges in a game and relative chess rating (i.e., the difference in chess rating between the player and his opponent) was –.39, and the correlation between perceived skills in a game and relative performance (i.e., the difference in pieces still present on the chessboard between the player and his opponent) was .33 (Abuhamdeh & Csikszentmihalyi, 2013). Also considering the contextual differences between professional chess playing and work and the unique psychological makeup of expert chess players, these preliminary findings suggest prudence in applying the flow model to work using objective measures of challenges and skills.

Can organizations intervene in and “tune” their employees’ levels of perceived challenges and skills in an average workday? In principle, it seems possible to induce a reduction or augmentation of an employee’s level of perceived challenges by changing the level of difficulty of the work task or assigning the employee to a different task of the appropriate level of difficulty. By the same token, it seems possible to induce a growth in perceived skills through training and other personal and professional development programs. In an educational context, Moneta and Csikszentmihalyi (1999), based on the application of linear multilevel regression models to ESM student data, proposed that in order to foster students’ flow, teaching should aim at tuning the difficulty level in different ways depending on the phase of the learning process: in the initial phase teachers should provide opportunities for challenge-skill balance (easy beginning), and in the ending phase they should provide opportunities for imbalance toward greater challenges (difficult ending). By analogy, could managers foster their employees’ flow just by dosing the level of
task difficulty throughout the various phases of a work project? In order to answer this question one needs to delve deeper into the processes that govern variations of subjective experience and the emergence of flow at work.

**Flow as a nonlinear dynamic process**

In the past two decades or so, researchers modeled daily variations of subjective experience (e.g., concentration, absorption, or enjoyment) over perceived challenges and skills as a linear process. More recently, Ceja and Navarro (2009, 2011, 2012) argued that the variations of subjective experience at work — and hence the occurrence of flow — conform to nonlinear dynamic models, and provided empirical evidence in support of their claim (Chapter 5 of this book presents an extensive coverage of nonlinear dynamical systems theory, their models and findings). Linear models assume that the change of outcome variables (e.g., concentration) as a function of the change of predictor variables (i.e., challenges and skills) is smooth and continuous. In contrast, nonlinear models assume that as the system (e.g., the worker) departs from an equilibrium point its behavior will become increasingly unstable and turbulent to the extent that change in the outcome variable as a function of predictor variables becomes abrupt and discontinuous. The simplest instance of such abrupt changes is provided by Ceja and Navarro’s (2012; Navarro & Ceja, 2011) cusp catastrophe model of flow, which is shown in Figure 7.1. Figure 7.1 (a) highlights the edge of the cusp, which is the source of instability in this model. When “walking” on the edge of the cusp, a worker faces a bifurcation: a minimal fluctuation of his levels of challenges and skills may result in either a sharp improvement of subjective experience or a sharp deterioration of subjective experience, and the probability of either outcome is about 50%. This means that when in the cusp zone, the approach to the flow state is an inherently unstable process that could fail abruptly, and its instability is not due to random error but to a deterministic mechanism. The bottom line is that, based on this model, the occurrence of flow at work in the cusp zone is unpredictable although it is deterministic. In particular, being in the cusp zone implies both the highest probability of experiencing flow suddenly and the highest probability of experiencing the opposite of flow suddenly, and hence the greatest variability of outcomes.

How does the nonlinearity of flow influence the way a worker can enter flow at work? Figure 7.1 (b) shows the two extreme cases: smooth pathway and troublesome pathway to flow. On the one hand, the smooth pathway begins with low challenges and low skills, proceeds by just increasing skills until the point the worker feels extremely skillful in handling low challenges, and finally proceeds by just increasing challenges to reach the high-challenge, high-skill state of flow. On the other hand, the troublesome pathway begins with high challenges and low skills, and proceeds by just increasing skills until the point the worker can progress toward the flow state only if he somehow manages to “climb” the steep inner wall of the cusp. As such, the smooth passage to flow avoids the instability of the cusp, the troublesome pathway faces it fully, and any other path in between the two faces intermediate levels of instability.
FIGURE 7.1 Cusp catastrophe model of flow experiences at work showing (a) the bifurcation edge, and (b) smooth and troublesome pathways to flow (adapted from Ceja & Navarro, 2012, Navarro & Ceja, 2011)
Taken at face value, the model would suggest that the safest and most efficient way for managers to foster flow in their employees is to keep them in a cottoned practice state for a long time before asking them to engage fully in a complex work task. However, this is not possible for two reasons. First, the safe pathway belongs more to the educational context – with the caveat that it borders on spoon-feeding – than to the organizational context, wherein training, professional development, and managerial support are more tightly constrained to the need of producing results rapidly and efficiently under the pressure of strong competition. Second, Ceja and Navarro (2012) found that workers who are more often in the cusp zone have more flow at work than those who are less often in the cusp zone. This they interpreted as evidence that perceived challenges play the key role in triggering flow. As such, both organizational and psychological reasons indicate that any organizational intervention aimed at fostering employees’ flow should guide them to reach flow through troublesome pathways that involve staying in and closely around the cusp zone. The key implication is that, because the cusp zone yields maximal instability, any such intervention will result in high failure rates. In simple words, if an organization wants flow, it has to accept the risk and cost of frequent failure.

**Is flow for all workers?**

Given that entering flow at work appears to be a troublesome endeavor, any plan for an organizational intervention should deal with the sticky issues of whether every worker (a) can enter flow at work, and (b) likes entering flow at work. Mosing et al. (2012) estimated the heritability of flow proneness, meant as individual differences in how often people experience flow in their daily lives, in a sample of Swedish identical twins, and found that the heritability across the domains of work, maintenance, and leisure is moderate (.29–.35) and is explained by the same genetic factors across the three domains. These findings imply that a small but relevant proportion of the population cannot enter flow in general, and at work in particular. These “non-flow-ers” cannot be identified when flow is measured using scaled items, simply because even low scores obtained on absorption and concentration items would be automatically interpreted as “low flow” as opposed to “nonflow.” Non-flow-ers, instead, can be identified using the Flow Questionnaire (Csikszentmihalyi & Csikszentmihalyi, 1988), which proposes definitions of flow and asks respondents to recognize them and describe the situations and activities in which they experience flow. Confronted with extreme descriptions of absorption and concentration (e.g., “I think that the phone could ring, and the doorbell could ring or the house burn down or something like that. When I start I really do shut out the world”), a sizeable number of respondents state that they never had such experiences. For example, 32.7% of respondents in a sample of British workers from a wide range of occupations reported never having had flow experiences even if these were described in moderate language. As such, the answer to the first sticky question is that, no matter how effective it might be, an organizational intervention will not be able to foster flow in all participating employees. The key implication
of this impossibility is that organizational interventions on flow may marginalize a proportion of employees and create false expectations.

Although at least two of three workers experience flow, how many of them do experience it at work? Moneta (2012b) used the Flow Questionnaire to ask flow-ers to list freely up to five activities in which they experienced flow, and to pick the one that best represented the proposed flow descriptions. The chosen flow-conducive activities were then coded by independent judges into the “work” or “leisure” categories. Findings showed that more than 58% of the flow-ers had the most representative flow experiences in leisure activities. These findings suggest that a wide proportion of the working population is a potential target for organizational interventions aimed at “converting” them from the flow of leisure to the flow of work.

However, there are three main reasons why not all leisure flow-ers can be converted. First, the occurrence of flow at work is likely to depend heavily on the incentives inherent to the specific work tasks an employee is assigned to, as well as to that employee’s job as whole: in a number of cases a poor worker-job matching cannot be improved within the organization by, for example, assigning the worker to different tasks. Second, the cusp catastrophe model of flow implies that experiencing flow at work requires being frequently in the unstable cusp zone, wherein downturns and failure to reach flow are frequent: only some employees have the hardiness to withstand the inherent instability that is required for flow to occur. Finally, a number of leisure flow-ers chose jobs that do not require them to be in flow: for them the job functions as a resting platform to project into flow-conducive leisure activities – such as rock-climbing, sailing, alpine skiing, or scuba diving – on the weekends and holidays. Therefore, the answer to the second sticky question is that there is a sizeable proportion of the work population who would be capable of experiencing flow at work but on whom any organizational intervention would hardly sort out the intended effect, and might even produce undesirable consequences.

Organizational strategies to enhance flow at work

**Strategy 1: worker-job matching**

Numerous studies have identified personality traits that influence the occurrence of flow at work either directly or indirectly, by moderating the relation between antecedents of flow and flow, and between flow and performance. Organizations can profitably use these traits when making the decision to hire new employees, and when planning the professional development and allocation to work tasks of their employees. We will consider here a selection of two traits that link in well with classic theories of motivation: achievement motivation and intrinsic motivation.

Achievement motivation is seeking success in competition with a standard of excellence (McClelland, Atkinson, Clark, & Lowell, 1953), wherein the standard can be internal (i.e., competition is with self) and/or external (i.e., competition is with others). The need of achievement stems from the enjoyment of the experience of doing better, and entails seeking situations in which to have such experience
Applications of flow to work (McClelland, 1985). Two studies unveiled the powerful influence achievement motivation has on the occurrence of flow and its consequences for performance. Eisenberger et al. (2005) administered the ESM to a sample of employees from an electronics and appliances retailer in the United States, and examined how the combinations of perceived challenges and skills at work influenced the employees. They found that only for employees with high need for achievement the combination of high challenge and high skill (i.e., the “flow zone”) yielded scores of positive mood, task interest, and organizational spontaneity – an important facet of performance in that organizational context – that were higher than in any other combination of challenge and skill. Demerouti (2006) investigated the relation between the experience of flow – measured using the Work-Related Flow Inventory (WOLF; Bakker, 2008) – and other-rated in-role and extra-role performance in a worker sample from mixed occupations in the Netherlands. She found that conscientiousness – a broad trait that incorporates achievement motivation as a key facet – was an important moderator to the extent that there was a relation between flow and performance only for employees who scored high on conscientiousness. Taken together, the findings of these studies indicate that (a) achievement motivation moderates the relation between the main antecedents of flow and flow in such a way that only highly motivated employees “utilize” the flow zone to enter flow, and (b) achievement motivation moderates the relation between flow and job performance in such a way that only highly motivated employees “utilize” flow to enhance performance.

Intrinsic motivation is the tendency to engage in tasks because one finds them interesting, challenging, and enjoyable (Deci & Ryan, 1985; Ryan & Deci, 2000) and a key predictor of creative achievement (Amabile, 1996). When measured as a trait in the work context (Amabile, Hill, Hennessey, & Tighe, 1994), intrinsic motivation is the tendency to be driven by the engagement of novel and challenging work. Based on self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000), one would expect trait intrinsic motivation to be conducive to flow at work. However, based on the social psychology approach to creativity (Amabile, 1996), one would expect such relation to be conditional on the job providing plenty of open-ended problems, for which creativity is both possible and desirable. Moneta (2012b) used the Flow Questionnaire to measure flow at work in a sample of highly educated British workers from a wide range of occupations, and found (a) that opportunity for creativity in the job moderates the relation between motivation and the probability of experiencing flow in work relative to not experiencing flow at all, in such a way that intrinsic motivation is positively associated with flow for high opportunity, and it is less associated with flow for low opportunity, and (b) that opportunity moderates the relation between motivation and the probability of experiencing flow in work relative to experiencing flow in leisure, in such a way that intrinsic motivation is positively associated with flow in work for high opportunity, and it is negatively associated with flow in work for low opportunity. The findings of this study indicate that intrinsic motivation can be “channeled” into flow only if the job provides ample opportunity to do creative work, and that workers with low
intrinsic motivation are more likely to experience flow if the job provides them with limited opportunity for creativity.

The found moderation patterns can be interpreted within the framework of Lazarus and Folkman’s (1984) person-environment (P-E) fit theory, which postulates that a worker will be more likely to experience positive outcomes, such as high job satisfaction and engagement, if there is a consonance between worker and work environment. In particular, there is high P-E fit when a worker provides what the work environment needs (demand-ability fit) and the work environment provides what a worker needs (need-supply fit). As such, the implication of the found moderation patterns for organizations is that flow can be enhanced at work by matching workers’ motivational profiles with job characteristics. In particular, highly achievement-oriented employees should be assigned to tasks wherein they can frequently experience the combination of high challenges and high skills (i.e., the flow zone); based on Atkinson’s (1957) model of achievement motivation these are tasks that yield a clear distinction between success and failure, and are of medium difficulty (i.e., the probability of success is about 50%). Workers with low intrinsic motivation should be assigned to algorithmic tasks, in which they are given beforehand a complete set of steps for completing the task, and completing the task is only a question of carrying out the steps (Amabile, 1996). Finally, workers with high intrinsic motivation should be assigned to heuristic tasks, in which discovering the steps for completing the task is part of the task itself (Amabile, 1996). Because flow and performance have a multifactorial etiology, these abstract person-job matching principles should be traded off with other factors, such as employees’ skills and expertise.

**Strategy 2: applying and developing the progress principle to team flow**

Because most intellectually challenging and creative work being done in contemporary organizations occurs in team projects, it is important to consider the role of flow in teams. To varying degrees, teams require communication and collaboration among members. This raises the issue of whether flow, which was originally defined within an individualistic phenomenology that depicts the person as separate from nearly everything but the task at hand, can be applied to the understanding of team work. A fast answer to the question can be found in sports. For example, Bakker et al. (2011) investigated the effects of flow on performance in soccer players from talented teams in the Netherlands. The soccer players completed the Flow State Scale (Jackson & Eklund, 2002), which is designed specifically for sport activities, with reference to a specific match, and the coaches rated the performance of each of their players in that match. The average flow score in a team (i.e., flow at the team level) was higher in drawn and won matches than it was in lost matches, and it correlated with the average coach rating of performance in the team (i.e., performance at the team level). Therefore, flow – although it is commonly viewed as a solitary experience – appears to be a team resource and a promoter of team performance.
In large corporations, teams are typically constituted by a group of peers and a supervisor who is responsible for keeping the team project on target to completion and for liaising with upper management throughout the process. Amabile and Kramer (2011) conducted a unique longitudinal study of twenty-six such project teams from seven companies within three industries (consumer products, chemicals, and high-tech) in the United States. According to top managers in the companies, creativity was both possible and desirable in each of the teams’ projects. The study did not focus on and did not assess flow, but it provides invaluable suggestions on how team flow is created and maintained for the full duration of a team project.

Based on both quantitative and qualitative analyses of more than 11,000 daily reports provided by the team members, Amabile and Kramer (2011) developed a model of both individual and team performance. At the worker level, the model posits that individual performance in every workday is a function of workday events. Workday events influence perceptions about the organization, its managers, the work being done, and the extent to which work is accomplished, and foster positive or negative emotions. Perceptions and emotions go hand in hand and influence each other, so that, for example, an instance of positive leader behavior may foster positive affect, which in turn may foster a positive appraisal of management. Perceptions and emotions conjointly influence work motivation, including the identification of goals, the determination to pursue them, and the way they are pursued. Finally, the whole workday inner life – including the perceptions, emotions, and motivation lived in the course of a workday – determines the individual performance on that workday.

How does good performance on a single workday evolve into good long-term performance for the team as a whole? By focusing on specific project teams that demonstrated remarkable resilience and performance, Amabile and Kramer (2011) discovered that making real, meaningful progress in the team project day after day boosts long-term performance by enhancing work-related emotions, perceptions of the team and the organization, and hence work motivation, to create that virtuous cycle that exemplifies the progress principle. The progress principle essentially states that uninterrupted, stepwise progress feeds inner work life, which in turn fosters more progress, leading to an upward spiral. The perception of progress includes breakthroughs, small wins, goal completion, and demonstrable progress toward goal completion. In a workday there might be many different kinds of positive events, but what the progress principle states is that only the perception that real and meaningful progress was made in the team project work has the power to boost long-term performance. The bottom line is: what matters is progress, not just pleasant emotions.

The best team leaders acted promptly on project setbacks in order to prevent a vicious cycle that runs opposite to the progress principle. They achieved this by providing catalysts, such as: (1) setting clear short-term and long-term goals, including both direction and meaning of work, (2) allowing autonomy, with the aim of supporting intrinsic motivation and creativity, (3) providing resources, (4) giving just enough time to complete the work (but not too much time), (5) helping with work
when one needs it, (6) learning from both problems and successes, and (7) allowing ideas to flow freely within the team. Reading between the lines of Amabile and Kramer’s (2011) study with the lens of the nonlinear catastrophe model of flow, it would appear that the best team leaders actually fostered their subordinates’ flow by providing clear goals and unambiguous and immediate feedback on a daily basis, which in turn enabled workers’ construal of accurate perceptions of challenges and skills. Moreover, by directly helping team members in difficulty and by encouraging free flow of ideas among them in problem solving, it would appear that the best leaders supported directly and indirectly the team members when they were in the turbulent “flow” zone, which entails the highest risk of setback. Finally, it would appear that the best leaders, through these strategies, ensured that individual team members held coordinated goals that were well integrated with the overarching goal of the team project. In all, this reading of the progress principle advances that teams are more likely to keep on track and achieve their project goals creatively if their team members are frequently in flow and their flow states are coordinated and synergistic. From this perspective, team leaders are good insofar as they are able to make the synergism of flow in the team happen.

Is flow contagious? A wide literature under the rubric of emotional contagion – “The tendency to automatically mimic and synchronize facial expressions, vocalizations, postures and movements with those of another person and, consequently, to converge emotionally” (Hatfield, Cacioppo, & Rapson, 1994, p. 5) – indicates that emotions can transfer to one another when people interact verbally or nonverbally. Flow cannot be defined as an emotion. However, ESM studies found that momentary flow states are typically followed by heightened positive affect (e.g., Engeser & Baunmann, 2016; Fullagar & Kelloway, 2009), so that flow might spread because its consequent emotions do and, in turn, foster flow. Moreover, in structured relations involving individuals with varying levels of expertise, the flow-performance link may foster modeling, so that the flow of models might spread because its consequent success is noticed and emulated. It is therefore likely that flow crosses over people who work in interaction with one another. Bakker (2005) investigated the relationship between the experience of flow – measured using the Work-Related Flow Inventory (WOLF; Bakker, 2008) – of music teachers and of their students, and found a positive and moderate correlation (.35). As such, flow appears to be contagious at least in artistic endeavors involving dyads with different levels of expertise.

Structured teams with a supervisor and teacher-student dyads involve power relations such that the responsibility for collective flow resides heavily on a leader’s shoulders. Does collective flow require such hierarchical relations? Sawyer (2006, 2007) consistently found that this is not the case. He started addressing the question by observing jazz ensembles in Chicago in the 1980s, and then extended his findings to improv theater groups, sports teams, and finally business teams. These groups come to existence spontaneously, with people joining in and dropping out at virtually any point in time throughout the life of the team. Team members have generally equal status, except for they become rapidly aware of differences in skills among their team members. These nonhierarchical, distributed teams were found to
be extremely successful in a variety of contexts. However, the success of such teams was found to heavily depend on three main factors. First, the team project should have a somewhat unpredictable outcome, rather than a firm endpoint. There of course must be a goal, and it should be sufficiently focused and narrow to allow that team members understand whether they are making progress, but open-ended enough to allow for creative problem solving. Second, the team task must have a moment-to-moment contingency structure, such that every action by a team member depends on the prior action by the same or other team member. This ensures that the team is working as whole rather than as a group of isolated individuals who may also be in flow, but each on a different planet. Third, any team member’s action at any given point in time can be later modified by the same and other team members. This allows for progressive modifications of both problem solving and problem finding, in that the team can modify or sharpen the goals of the project pending on results and the progress made. The last two requirements imply that, in order to function, a distributed team must be collaborative, with each member contributing equally and hence holding equal status in practice. Sawyer (2006, 2007) presented ample evidence that if these core requirements are fulfilled, distributed teams develop and maintain team flow for the duration of the project, and by capitalizing on continued team flow tend to produce more creative team project output.

Because flow has been typically viewed as a solitary experience in individual endeavors, one might question whether collective flow is as fulfilling and growth-generating as individual flow is. Walker (2010) was the first to discover that flow experienced in social interaction is more enjoyable than flow experienced in social isolation. Paez, Rimé, Basabe, Wlodarczyk, and Zumeta (2015) replicated Walker’s (2010) finding using correlational data gathered in two group activities – spontaneous folkloric dance and experimentally induced protest demonstration – and found, in addition, that group flow is associated with group efficacy. Salanova, Rodríguez, Schaufeli, and Cifre (2014) replicated Walker’s (2010) finding using two-wave data gathered in experimental conditions involving a simulated work task, and found, in addition, that group flow and group efficacy have a reciprocal longitudinal relation, such that more group flow fosters more group efficacy, and vice versa. These studies indicate that collective flow in various contexts, including work, is highly enjoyable and builds up psychological resources at least as much as individual flow does. Therefore, group flow represents a new target variable for organizational interventions.

Organizations can foster team flow and hence creativity at work informally – for example, by facilitating free exchange of information and spontaneous collaboration in the corridor as opposed to the committee meeting room. They can also introduce formal programs that allow for the spontaneous creation of distributed teams. For example, Google allows its engineers to devote up to 20% of their paid work time on a project of their own liking, and this program has produced spontaneously a variety of applications that were eventually picked up by management and implemented, such as Google News and AdSense for Content. This program is not formally collaborative, but it could be made explicitly so in a variety of
organizational contexts. If introduced as optional, a formal collaborative program would allow for self-selection, and hence avoid the risks inherent in pressuring people toward flow and creativity.

**Strategy 3: selection of work flow-ers**

Up to this point, we have considered strategies that can be implemented in ideal organizational contexts, wherein companies are profitable and well positioned in their markets, and have plenty of resources to invest for the professional development and retention of their employees. However, since the outbreak of the worldwide economical recession in 2008, the scenario for companies and their employees has drastically deteriorated across the board, and there has been a fast growth in the number of start-up companies. Start-up companies confront difficulties in positioning themselves in the markets, have shortage of funds, staff, and competencies, and hold a limited temporal outlook for development because they face a high risk of sudden merging or failure. What recruitment strategy should these companies adopt? One plausible emergency strategy is, other things being equal, to select work flow-ers – that is, persons who experience more flow at work no matter what. Based on self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) one would expect work flow-ers to be comparatively more intrinsically motivated and hence more flexible and resilient in a non-autonomy-supporting environment. Moreover, based on the phenomenology of flow as a state of deep concentration on a limited field of stimuli that isolates and buffers the person from the surrounding environment, one would expect work flow-ers to engage more in work and perform better particularly when the work conditions are adverse.

De Fraga and Moneta (2016) conducted a pilot correlational study on a multicultural sample of 177 workers of mixed occupations to test the broad conjecture that flow functions as a buffer and makes a worker less sensitive to perceptions of the work environment. As a starting point of the investigation they adopted the self-determination model of work engagement, which has been corroborated in both individualist and collectivist cultures (e.g., Deci et al., 2001). The model posits that perceived managerial autonomy support fosters satisfaction of intrinsic psychological needs – autonomy, competence, and relatedness – and, in turn, satisfaction of these needs fosters work engagement and well-being. De Fraga and Moneta hypothesized that flow at work would moderate (1) the positive relation between perceived managerial autonomy support and work engagement, in such a way that for persons with more flow at work the relation would be weaker, and (2) the positive relation between perceived managerial autonomy support and satisfaction of the intrinsic psychological needs, in such a way that for persons with more flow at work all three relations would be weaker. Flow was measured using the Flow Short Scale (FSS; Engeser & Rheinberg, 2008). Regression analysis using a set of Hayes’s (2013) moderated mediation models supported hypothesis 1, showing that there is no association between perceived managerial autonomy support and work engagement for workers with high levels of flow at work. The analysis also supported
hypothesis 2 but limitedly to the needs of competence and relatedness, showing that the positive relation between perceived managerial autonomy support and these needs is weaker for workers with higher levels of flow at work. In all, these findings support the broad conjecture that work flow-ers are more capable of engaging in work when the work environment is less than ideal. As such, work flow-ers are attractive candidates for companies that are in dire straits.

**Strategy 4: fostering the metacognition of flow**

A final and crucial question affecting any flow-enhancing intervention in the workplace is whether and to what extent flow can be self-regulated. It is well known that when people read about flow or respond to flow questionnaires, they generally recognize flow in their life experiences and construe it as a very positive phenomenon. Nevertheless, how many can make flow happen at will in their average workday? If workers were able to decide when it is time to rest and when it is time to venture into the “flow zone,” and were able to proactively seek clarity of goals and unambiguous feedback when these do not come to them, would the managerial work become more “agile,” strategic, and effective? Moreover, if there were individual differences in workers’ ability to make flow happen, could we learn the lesson from those championing flow and use it to coach the others? These questions raise the possibility for organizations to intervene on and enhance the natural predisposition workers have to enter flow at work.

There is ample but anecdotal evidence suggesting that eminent intellectuals know how and when to enter and exit flow in their work endeavors. Currey (2013) provided some sharp and hilarious portraits of the daily rituals famous artists used to perform in order to drive themselves into the flow of art making. Among them, Ernest Hemingway is arguably the one who developed the deepest insight in the function and use of flow exit: “I had learned already never to empty the well of my writing, but always stop when there was still something there in the deep part of the well, and let it refill at night from the springs that fed it” (Hemingway, 2004, pp. 15–16); and in the use of resting time: “All I must do now was stay sound and good in my head until morning when I would start to work again” (Hemingway, 2004, p. 45). He also had a clear understanding that when in flow it is difficult to evaluate the quality of one’s own work: “I was sure this was a very good story although I would not know truly how good until I read it over the next day” (Hemingway, 2004, p. 4). In sum, Hemingway and other outstanding intellectual workers who lived before the term flow was introduced had a clear understanding of the usefulness of flow for their work, of how to get into it, how to get out of it at the appropriate time, and how to alternate flow and rest in their daily work schedule in order to maximize their work performance. What about “normal” workers?

Wilson and Moneta (2012) used the Flow Questionnaire to perform textual analyses of flow descriptions in a British worker sample from a wide range of occupations using open-ended questions that were developed by Massimini, Csikszentmihalyi, and Delle Fave (1988). The questions concerned how the flow state
started, how it felt during the activity, and how they kept the flow state going. The qualitative analysis of the textual data revealed that respondents with high job responsibilities, such as operating surgeons, were the most aware of the benefits of being in flow while engaged in complex and risky job tasks, and were believed to be able to activate and use flow at will to cope with difficult situations. These findings suggest that at least workers in high-responsibility jobs have a metacognition of flow that helps them to enter flow when the situation requires it.

Metacognition refers to the knowledge and beliefs about one’s own cognitive regulation and the capability to deconstruct and understand them through reflection and problem solving (Flavell, 1979). The study of metacognitions has been applied in the fields of clinical psychology (Wells, 2009; Wells & Matthews, 1994) and positive psychology (Beer & Moneta, 2010, 2012). The development and application of metacognitive therapy (MCT; e.g., Wells, 2009) has shown that intervening on metacognitive beliefs can be more effective than intervening on the content of those beliefs. For example, changing one’s beliefs about the uncontrollability of worry can be more effective in reducing anxiety than trying to prevent one from worrying. By analogy, it is possible that strengthening one’s beliefs that flow is useful and can happen at will can be more effective in fostering flow than trying to foster flow by means of external influence. The development and initial application of the Flow Metacognitions Questionnaire (FMQ; Wilson & Moneta, 2016) indicate that flow-specific metacognitions predict the intensity of flow in work better than measures of maladaptive and adaptive metacognitions, and the frequency of flow in work better than established measures of flow intensity. As such, metacognition is a candidate target for flow-enhancing interventions.

Although the study of flow-specific metacognitions is still at an early stage, organizations may consider fostering awareness of and insight into the causes and consequences of variations in subjective experience at work. Chapter 5 of the present book explains that the estimation of nonlinear dynamic flow models requires applications of the ESM that last for at least three weeks. Such applications could also be used to conduct metacognitive interventions using the technique of event history analyses. Event history analysis is used to discern whether and to what extent a certain class of events influences the subsequent behavior of one or more outcome variables, which in this instance could be flow and some facets of job performance. Encouraging employees to engage in the history analysis of their own streams of experiential data, coupled with insight coming from the statistical analysis of their personal data, could result in more flow at work indirectly, by enhancing a worker’s flow-specific metacognitions.

Conclusion

The first section of the chapter proposed that it is possible to foster employees’ flow at work by means of organizational interventions. However, a range of research findings converges in indicating that it is an inherently complex endeavor, is risky, and is subject to constraints. The section highlighted the importance of
specifying the operationalization of flow and the model of flow on which to base an intervention, as well as the need of drawing a detailed map of the constraints of the organizational context within which an intervention is conducted. The second section of the chapter focused on four interesting organizational strategies that have the potential to tackle the task at the appropriate level of complexity. These were sorted from solidly grounded in empirical research to more speculative. In order to evaluate the effectiveness of these and other organizational strategies there is the need to conduct randomized clinical trials with relatively long follow-ups.

This chapter did not explicitly cover a paramount issue. No matter how motivated and supported they might be, workers would risk extinction if they were in flow at all times. In particular, workers who are in a state of poor recovery in the morning tend to experience less flow later in the workday (Debus et al., 2014). Moreover, excessive flow is deemed detrimental to one’s own health to such an extent that workers at times devise strategies to disrupt it in order to recover from exhaustion (e.g., Guptill, 2012). As such, excessive flow at work might be an instance of “too much of a good thing” (Grant & Schwartz, 2011), and even lead to lower job performance. Arguably, workers need breaks in which they restore the energy needed for a new task engagement. Research has not yet identified the best type of rest, ranging from chatting with colleagues about sports to shifting attention to more creative work tasks, and the optimal alternation between flow and other states at work. Among the nonflow states, one should consider other optimal states, such as mindfulness, which do not require the tunneling of attention typical of flow but were nonetheless found to foster employees’ well-being and performance (e.g., Reb, Narayan, & Chaturvedi, 2014). A shift of research focus from single optimal states to optimal sequences of states, including flow, holds a great potential for enhancing employees’ well-being and performance.

References


Flow is a subjective state experienced when individuals are completely absorbed in an enjoyable activity. It comprises an exclusive, intense concentration on the task at hand, and subsequent enhancement of subjective experience (Csikszentmihalyi, 1975). Although limited, there is evidence that flow may be associated with positive organizational outcomes (Eisenberger, Jones, Stinglhamber, Shanock, & Randall, 2005) and work performance (Demerouti, 2006). As evidenced by the current volume, we are witnessing the emergence of interest in incorporating flow into the work psychology literature.

However, it can be argued that, to date, the concept of flow has not garnered significant attention in industrial and organizational psychology (I/O) research and theory, at least in the United States. The term “flow” does not appear in the subject indices of three separate handbooks of I/O psychology published since 2003 (Weiner, Borman, Ilgen, & Klimoski, 2003; Weiner, Schmitt, & Highhouse, 2013; Zedeck, 2011). A search for “flow” in the titles and abstracts of all programs and presentations at the annual conferences of the Society for Industrial and Organizational Psychology from 2003 to 2014 reveals only twelve poster presentations (Culbertson, Fullagar, Simmons, & Zhu, 2014; Eisenberger, Jones, Shanock, & Teglund, 2004; Freeman, Waples, Fullagar, & Knight, 2011; Fullagar, 2006; Fullagar & Kelloway, 2008; Fullagar, Knight, & Sovern, 2009; Ross, Wood, & Keiser, 2014; Rupayana, 2009; Sackett, Schmidt, & Shanock, 2007; Waples, Knight, & Fullagar, 2013; Waples, Stetzer, & Knight, 2014, Waples, Stetzer, Knight, Sackett, & Fullagar, 2012), nine of which, incidentally, had authors associated with a single academic department. A PsychINFO search for the terms “flow” or “optimal experience” in the titles of articles published in the leading academic journal in I/O, the Journal of Applied Psychology, found no hits as of June 2014. The same was true for Academy of Management Journal, Academy of Management Review, Organizational Behavior and Human Decision Processes, and Personnel Psychology. Three articles meeting these search criteria were...
found in the *Journal of Organizational Behavior* (Ceja & Navarro, 2011; Demerouti, Bakker, Sonnentag, & Fullagar, 2012; Eisenberger et al., 2005), two in the *Journal of Occupational and Organizational Psychology* (Fullagar & Kelloway, 2009; Mäkikangas, Bakker, Aunola, & Demerouti, 2010), and two in the *Journal of Occupational Health Psychology* (Demerouti, 2006; Nielsen & Cleal, 2010). Of course, research on flow at work has been published in other outlets, but the topic has had sparse exposure in the “mainstream” I/O literature. Although flow has gained acceptance in other specializations within psychology, it does not seem to be making substantial headway among I/O psychologists, despite its status as an established construct.

There are several possible explanations for the lack of attention devoted to flow in the I/O literature. One is that flow is conceptually similar to other constructs, specifically engagement, which I/O psychologists have studied for years (Rupayana, 2009), raising questions about the necessity of studying another variable. While there are similarities between flow and engagement, and this may explain some reluctance to study flow among I/O researchers, we believe that the specific components of flow described by Csikszentmihalyi provide adequate conceptual distinction between it and other constructs. For example, Newman, Joseph, and Hulin (2010; Harrison & Newman, 2013) argue that popular measures of engagement (e.g., Schaufeli, Salanova, González-Romá, & Bakker, 2002) actually assess general job affect. Flow, while incorporating what Csikszentmihalyi (1990) calls an *autotelic experience*, or a sense that the task provides an intrinsically satisfying experience, also includes several experiential dimensions that are conceptually distinct from affect. It is interesting that a recent review of burnout and engagement research (Bakker, Demerouti, & Sanz-Vergel, 2014) fails to mention flow, suggesting that its authors, who have each published numerous articles on flow, also see a clear distinction between flow and engagement.

It is our contention that flow has failed to attract the attention of I/O researchers at least in part because the bulk of flow research has not explicitly considered the construct’s relevance and implications for established work-behavior theories. Consequently, the possible relationships between flow and many work-related psychological constructs have been neither conceptualized nor tested. That is, the question of where flow falls in relationship with such constructs, and how it contributes to our understanding of their impact on work behavior, needs to be more thoroughly and systematically explored. Building upon this conclusion, this chapter presents a few examples of how the construct of flow might contribute to the understanding of the operation and limitations of established I/O theories, as well as how such theories might expand the understanding of the operation and limitations of flow.

**Work motivation**

A prime candidate for understanding the potential role of flow in work behavior is motivation theory. Research has shown flow to be related to performance (e.g., Eisenberger et al., 2005), which may be attributable to its proposed ties to motivation (Nakamura & Csikszentmihalyi, 2002). To date, discussion of flow’s
implications for work motivation has been largely limited to Deci and Ryan's (2000) self-determination theory. In the following sections, we discuss the nature of motivation, the current status of work motivation theory, and how the constituent components of flow might help us better understand worker motivation (and vice versa). We do not attempt to consider every possible relationship between work motivation and flow, but hope to illustrate some of the possible links between the two constructs.

Motivation is defined as the process that determines the direction, intensity, and persistence of behavior (Kanfer, Chen, & Pritchard, 2008; Mitchell & Daniels, 2003). That is, a useful motivation theory should explain the specific tasks in which a person engages, the amount of effort expended in performing those tasks, and the duration of the person's engagement in those tasks. In the context of work, motivation theories are thus focused on understanding factors that determine why workers engage (or fail to engage) in specific work-related tasks, the effort (typically conceptualized as time and resources expended) applied to those tasks, and the degree to which they maintain engagement in the tasks across time.

Csikszentmihalyi (1990) has described tasks that invoke flow as being intrinsically rewarding. Such tasks lead to internal states that serve as reinforcement for performing the tasks. That is, flow is thought to motivate individuals through the association between its positive experiential features at the cognitive and emotional levels and the antecedent performance of the flow-inducing task. The most obvious example of this process might be the potentially reinforcing properties of flow as an autotelic experience. The positive and enjoyable experience associated with performing flow-inducing tasks can be expected to motivate people to continue to engage in those tasks. Similar reinforcing effects might be expected from experiencing other aspects of flow, such as action-awareness merging, a strong sense of control, or a loss of self-consciousness. While the reinforcing potential of the flow experience is logical and compelling, work motivation theory and research over the past several decades have largely abandoned purely operant explanations in favor of cognitive approaches, that strive to document the mental processes that explain motivation and performance. We believe that for flow theory to contribute to the work motivation literature, its implications for the processes included in modern motivation theories must be examined.

Over the last several decades a number of compelling theories of work motivation have been proposed and tested, ranging from behavioral approaches (e.g., Komaki, Coombs, & Shepman, 1991; Skinner, 1990) to more complex perspectives, such as cognitive (e.g., Vroom, 1964) and trait-based (Kanfer & Heggestad, 1997, 2000) theories. These theories have traditionally been treated as competing explanations for motivated work behavior. Recently, however, Schmidt, Beck, and Gillespie (2013) argued that the research literature on work motivation has come to be dominated by goal-based theories, and that many established motivational constructs can be understood and integrated via their relationships with goal processes. This perspective provides a relevant and convenient framework for examining the relationship between motivation and flow in the workplace. By considering the
ways in which flow might be associated with different components of the goal process, the possible contributions of flow to work motivation theory may be clarified.

**Goal setting and flow**

Goal processes in motivation can be divided into *goal setting* and *goal striving* components (Lewin, Dembo, Festinger, & Sears, 1944; Schmidt et al., 2013). Of these, research in I/O psychology has traditionally focused on goal setting, or the manner by which performance goals are established. In particular, the goal-setting theory of Locke and Latham (1990, 2002) has been the focus of extensive empirical research, with consistent and supportive findings. Goal-setting theory states that specific, difficult goals will result in higher performance than less difficult or less specific goals. It is believed that difficult and specific goals focus attention and effort on a task, while providing clear performance standards that serve to determine task persistence (Locke & Latham, 2002; Locke, Shaw, Saari, & Latham, 1981). When accompanied by adequate feedback, difficult, specific goals have indeed been consistently found to result in higher performance than no goals, easy goals, or vague, “do-your-best” goals.

Goal setting appears to be a logical avenue by which to incorporate flow into work motivation theory. Csikszentmihalyi (1997; Nakamura & Csikszentmihalyi, 2002), in describing the nature of flow, included three factors that can be considered not as aspects of the subjective flow experience but rather as preconditions that encourage or contribute to the experience of flow. These include *challenge-skill balance*, *clear goals*, and *unambiguous feedback*. These conditions are determined, wholly or in part, by task characteristics or situational factors, and define circumstances under which flow is most likely to emerge.

Specifically, *challenge-skill balance* exists when task demands and individual capabilities are matched, so people can effectively cope with those demands (Csikszentmihalyi, 1990). That is, either the challenge presented by the task must be tailored to the skill of the individual, or the skill of the individual appropriately enhanced when tasks are too demanding. To maximize flow, both challenge and skill should be “personally high” (Jackson & Marsh, 1996, p. 18). *Clear goals* refer to a person having “a strong sense of what he or she is going to do” (Jackson & Marsh, 1996, p. 19). Prescriptively, flow might be encouraged by establishing appropriate goals in advance, or by clarifying and emphasizing cues intrinsic to task performance. *Unambiguous feedback* refers to information by which individuals can judge their progress. When tasks provide this information, flow experiences should be enhanced. External feedback is necessary for tasks lacking intrinsic feedback.

The potential relationships among the performance benefits of goal setting and the subjective experience of flow can be seen in the apparent parallels between the preconditions for flow and the prescriptions of goal-setting theory. Challenge-skill balance is analogous to goal-setting’s recommendation that goals should be difficult yet attainable. The requirement in flow theory for clear goals is similar to goal setting’s prescription that goals be specific. Finally, both theories emphasize...
the importance of performance feedback. It therefore seems logical to expect that circumstances designed to enhance task performance through setting specific, difficult goals would also promote the onset of the experience of flow during the performance of those tasks. Further, given the well-established relationship between goal setting and task performance, one would expect a positive relationship between flow and performance.

These hypotheses were tested by Waples, Knight, and Fullagar (2013), using an experimental design that required participants to perform a standardized task, once with specific, difficult goals (tailored to individual skill levels) and once with do-your-best (DYB) goals. The goal conditions were counterbalanced, with half of the participants first performing a trial with the goal, and half performing a DYB trial first. The expected effect of goal setting was found, with higher performance in trials with specific, difficult goals. The predicted positive relationship between flow and performance was also obtained. (This latter effect, while encouraging, was based on retrospective measures of flow, which could have been influenced by participants’ knowledge of their performance.)

Unexpectedly, flow was lower on trials with difficult, specific goals than on DYB trials. Further analyses showed that participants who operated under DYB goals first had uniformly high flow across both trials, but those who were given specific, difficult goals first had substantially lower flow on their first trial. The flow experienced by this latter group was higher on the second trial, where they were given DYB goals, but their reported flow levels never reached those of the DYB-first participants. Waples et al. (2013) suggested that the inhibition of flow in the presence of goals early in the task is consistent with substantial research on the overjustification effect (e.g., Deci, Koestner, & Ryan, 1999, 2001). This literature demonstrates the negative effect of external constraints (e.g., performance rewards) on both interest in and intrinsic motivation to perform a task. One explanation for the effects of external constraints, derived from self-perception theory (Bem, 1967), is that external constraints shift an individual’s attribution for his or her behavior from internal to external causes, resulting in a decrease in intrinsic motivation and interest. Specific goals may represent an external constraint similar to extrinsic rewards. If so, participants performing the initial trial with specific goals may have been less likely to experience flow because their attention was focused on external performance demands, rather than the intrinsic aspects of the task. Alternately, those participants who had first performed under DYB conditions, and had already experienced relatively high levels of flow, did not suffer a reduction in flow once goals were introduced in the second set. Considering effects on performance, however, Waples et al. found that an early experience of high flow was related to increased performance on later trials, even in the absence of specific goals.

This study, the only one we are aware of to examine the relationship between goal setting and flow, suggests complex relationships. It may be that initial performance goals inhibit the experience of flow while performing a task, but that after flow has been experienced it has a positive association with performance. Further research on these relationships might help anchor flow theory to mainstream work.
motivation theory, and perhaps provide ways to improve the implementation of goal setting.

**Goal striving and flow**

Goal-setting theory is concerned with the way in which performance goals are established, and the effects of goals on task performance. Goal setting has arguably been the primary focus of work motivation research for three decades. More recently, in an effort to better understand the cognitive mechanisms by which goals operate, there has been increasing attention paid to the investigation of goal striving, as manifested in self-regulation processes that operate as individuals strive to accomplish goals across time (Schmidt et al., 2013). This research is based on the principles of control theory (e.g., Lord, Diefendorff, Schmidt, & Hall, 2010), which describes a “discrepancy reduction loop,” by which goals help define a desired state to which individuals compare their current status. If the current status is discrepant with the goal, behavior intended to reduce that discrepancy is initiated, and the efficacy of that behavior is assessed by comparing the resulting state to the goal. This process continues as long as goal discrepancy exists.

Certain experiential aspects of flow (Csikszentmihalyi, 1997) might be affected by and affect the self-regulation process described earlier. Specifically, self-regulation requires careful monitoring of the discrepancy between current and desired (goal) states. Such monitoring necessitates awareness not only of immediate task performance but also of the goal state and of the effects of task behavior on changes to the current state. Three of the dimensions of flow would seem to have implications for the ability of individuals to engage in effective self-regulation. These are (1) action-awareness merging, which occurs when involvement in a task becomes so deep that there is no awareness of the self as being separate from the task; (2) concentration on the task at hand, which results in a feeling of total focus or concentration on the task; and (3) loss of self-consciousness, which manifests as a loss of concern for the self, and “becoming one with the activity” (Jackson & Marsh, 1996, p. 21).

It could be hypothesized that these dimensions of the flow experience, by enhancing the individual’s awareness of and engagement in the task, would facilitate self-regulation. Certainly, when these aspects of flow are present it can be expected that the status of current task performance will be foremost in the awareness of the individual. However, task awareness is only one aspect of the self-regulation process. It may be that in experiencing flow people become less aware of situational constraints, such as goals, and fail to monitor the status of goal discrepancy as they perform job tasks. This would be analogous to Waples et al.’s (2013) suggestion that goals might focus attention on external constraints, thereby serving to distract from the task and hindering the onset of flow. If flow served to reduce awareness of performance goals and goal discrepancy, it might follow that goal-setting effects would be mitigated by the experience of flow.

One aspect of self-regulation that has been found to be related to both motivation and attitudes is the rate at which goal discrepancy is reduced. Rapid reduction
in goal discrepancy has been found to be associated with several positive outcomes, including positive mood (Lawrence, Carver, & Scheier, 2002), greater satisfaction and higher performance expectations (Chang, Johnson, & Lord, 2010), greater mental focus and reduced downward goal revision (Elicker et al., 2010). As with the general self-regulation process, it is not clear whether the experience of flow, through greater cognitive and affective involvement with the task, would enhance the effects of rapid discrepancy reduction, or if it would instead interfere with the accurate perception of discrepancy reduction by inhibiting attention to external constraints.

Goal framing

Another example of a goal-process variable that might help us to understand the possible role of flow in motivation is goal framing. Whereas goal setting addresses how goal levels are determined, and self-regulation processes aim to explain how individuals monitor progress toward goals, goal framing examines the manner by which goals are presented to, or understood by, individuals. The framing of a goal does not have implications for the goal itself, but rather how the goal is represented. Multiple goal frames have been suggested, the most common involving the distinction between approach goals and avoidance goals (Carver & Scheier, 1998). Approach goals involve discrepancy reduction, and are typical of the goals conceptualized in most goal-setting and self-regulation research. Avoidance goals, on the other hand, involve increasing discrepancy, or circumventing unwanted states. As outlined earlier, it is possible that goals may affect, positively or negatively, the development of flow. If so, whether goals are framed as approach or avoidance goals may moderate any such effects. Specifically, it would seem that the requirement for clear goals in the flow literature is couched in terms of approach goals. The effects of avoidance goals, and the avoidance of unwanted consequences, have not been addressed in the flow literature to date.

Perhaps more relevant to the experience of flow is the distinction between prevention goals and promotion goals (Higgins, 1997). Prevention goals are framed in terms of fulfilling duties and obligations, whereas promotion goals are framed in terms of achieving ideal outcomes. Compared to promotion goals, prevention goals have been associated with working more slowly and the minimization of mistakes (Förster, Higgins, & Bianco, 2003), as well as enhanced goal commitment (Shah & Higgins, 1997). Prevention goals have also been associated with a greater ability to subdue thoughts of competing goals (Shah, Friedman, & Kruglanski, 2002). Taken together, these findings suggest that describing goals using a prevention frame will promote several of the dimensions of the flow experience described by Csikszentmihalyi (1997), including concentration on the task at hand and a sense of control.

Expectancy theory and flow

Schmidt et al.’s (2013) argument that goal processes provide a general framework for modern work motivation theory is compelling. However, there are well-established motivation theories that do not focus primarily on performance goals, and which
may have implications for the application of flow to work behavior. One such cognitively based approach is expectancy theory (e.g., Vroom, 1964), to which we now turn to further explore the potential relationships between flow and work motivation.

*Expectancy* refers to "the perceived likelihood that an action will lead to a particular outcome" (Schmidt et al., 2013, p. 318). Though having been a continuing topic of interest among motivation researchers for nearly a century (Lewin, 1935; Tolman, 1932), expectancy has found widespread application to the world of work primarily as a result of Vroom’s (1964) conceptualization of expectancy theory. Sometimes referred to as valence–instrumentality–expectancy (VIE) theory, on the basis of its key components, the core elements of Vroom’s theory have remained largely unchanged since its inception, and suggest that an individual’s expected motivational force can be predicted by using a multiplicative function of his or her related perceptions of valence, instrumentality, and expectancy.

*Valence* is typically framed as a perceived property of a given outcome and, as a function of anticipated satisfaction, ranges from positive (expected to satisfy) to negative (expected to dissatisfy; Vroom, 1964). To the extent that the collective valence of considered outcomes is positive (negative), an individual can be expected to be more likely to experience motivation to approach (avoid) the associated behavior or task. Though VIE theory was, in its original conceptualization, focused on extrinsic outcomes, early revisions to the theory suggested the addition of valences associated with intrinsic outcomes (Galbraith & Cummings, 1967; House, 1971, 1996). House (1971, 1996) argued in support of two unique types of intrinsic valences that warranted inclusion under a more broadly conceived notion of the construct: (1) intrinsic valence associated with goal-directed behavior, and (2) intrinsic valence associated with work-goal accomplishment. It is the former that offers an appealing connection to flow theory.

The autotelic characteristic of the flow experience has long been one of the theory’s defining elements (Csikszentmihalyi, 1990). Appreciating task completion for its own sake, regardless of corresponding extrinsic outcomes, is consistent with the development of positive intrinsic valence perceptions. It follows that, over time, assessments of task valence would be positively influenced simply by experiencing flow while performing the task. Assuming that other components of the VIE model are held constant, flow can be expected to increase motivation to perform tasks from which it emerges.

*Instrumentality* was Vroom’s (1964) most obvious addition to earlier forms of expectancy theory. It refers to the perceived relationship between task performance and receipt of secondary outcomes (e.g., pay, promotion). Conceptually, positive instrumentality is characterized by the perception that successful task performance will lead to receiving a given outcome. Although, as a perceptual construct, instrumentality remains a subjective assessment, it is perhaps most strongly affected by externally established structures (e.g., compensation mechanisms, trust in management). Such sensitivity to external forces makes instrumentality distinct from valence and expectancy, which are both more strongly rooted in individual
preferences and interpretations. Historically, it has been precisely that sensitivity that has provided an opportunity for organizational management to create systems that foster motivation via greater clarity regarding the relationship between performance and rewards (House, 1971, 1996).

Similarly, creating an environment in which the prerequisite conditions for flow emergence have been met represents an opportunity for management to foster flow in the workplace (Nakamura & Csikszentmihalyi, 2002). While there are many antecedents of instrumentality perceptions (see Sims, Szilagyi, & McKemey, 1976), some overlap would seem to exist with the preconditions for flow. In particular, the availability of performance feedback and goal clarity are both required preconditions for flow and antecedents of perceived instrumentality (Nakamura & Csikszentmihalyi, 2002; Sims et al., 1976; Teas, 1981). By improving feedback processes and ensuring clear goal structures, management has an opportunity to clarify the relationship between task performance and outcomes (i.e., instrumentality), and simultaneously to enhance the likelihood of flow.

Expectancy, as defined previously, refers to the perceived likelihood of an action leading to an outcome. More specifically, as it relates to task performance, expectancy refers to the likelihood that a given level of effort will lead to a given level of performance (Schmidt et al., 2013; Vroom, 1964). That is, expectancy reflects the degree to which performance is believed to depend on the individual’s discretionary effort, as opposed to perceiving that external forces determine the likelihood of successful task performance. For some tasks, expectancy will be naturally high (e.g., physical tasks), while for others, it is likely to be lower, due to the influence of external constraints (e.g., retail sales). Nevertheless, as for valence and instrumentality, the determination is internal and subjective.

Of the three elements of VIE theory, flow is conceptually most similar to expectancy. As a state of effortful task immersion, flow occurs during the very effort-to-performance conversion that drives subsequent expectancy perceptions (Csikszentmihalyi, 1990). For a repeated task, reflection on previous experience should prompt consideration of flow characteristics. Action-awareness merging is strongly associated with automation of task-relevant behaviors (Jackson & Marsh, 1996), which should serve to clarify the relationship between effort and performance. Similarly, having previously perceived oneself as being in firm control of task elements can be expected to encourage a greater sense of self-determination with regard to future task completion (Sims et al., 1976).

In combination, expectancy, instrumentality, and valence summarize a system of cognitive evaluation targeting anticipated progression from effort to performance (expectancy), performance to outcome (instrumentality), and outcome to personal interests (valence). At each step of the evaluation process, flow has the potential for involvement. It is possible that, by fostering the emergence of flow, one should be able to increase performance motivation via the tenets of expectancy theory.

Before leaving this discussion, it should be noted that since flow is a momentary experience, and therefore necessarily assessed retrospectively, the predictive, future-oriented nature of expectancy may constitute a challenge when considering
the intersection of flow and expectancy theories. However, the repetitiveness of
tasks in typical work settings allows for the influence of previous experiences on
subsequent thoughts and behaviors. Accordingly, the cognitions associated with
each element of expectancy theory may be affected by earlier task experiences (e.g.,
flow state emergence).

**Flow and self-efficacy**

As mentioned earlier, in addition to cognitive approaches to understanding motiva-
tion, such as goal theories and expectancy theories, there has been growing interest
in examining the role of individual differences in work motivation (e.g., Kanfer &
Heggestad, 1997, 2000). One of the most widely studied individual variables in the
motivation literature has been self-efficacy. Understanding the relationships between
self-efficacy and the components of the flow experience would help anchor flow
theory more strongly within the motivation literature.

Self-efficacy refers to “beliefs in one’s capabilities to mobilize the motivation,
cognitive resources, and courses of action needed to meet given situational demands”
(Wood & Bandura, 1989, p. 408). Initially devised as an explanatory mechanism
for behavioral change (Bandura, 1977), self-efficacy has seen consistent applica-
tion to mainstream motivational theories since its conceptualization (Bandura, 1986,
1997; Locke & Latham, 2002). Within goal setting theory alone, self-efficacy has
been identified as a key moderator and mediator, while carrying its own note-
worthy direct effects. Generally speaking, increases in domain-specific self-efficacy
are thought to promote greater motivation and greater performance, though some
recent research has identified potential downfalls of heightened self-efficacy beliefs
(see Schmidt et al., 2013, for a brief review).

Though there has been relatively little overlap between their respective bodies of
literature, self-efficacy perceptions and the experience of flow seem to have inter-
esting implications for one another. Self-efficacy, like expectancy theory, consists
of future-oriented cognitive appraisal (Bandura, 1997). Accordingly, its integration
with flow theory is complicated by the issue of temporal precedence. Though we
have attempted to delineate the manner in which self-efficacy and flow may influ-
ence each other, it should be noted that the interplay between these constructs has
been conceptualized as reciprocal across task repetitions (e.g., Salanova, Bakker, &
Llorens, 2006).

Research on self-efficacy in the context of goal setting has consistently found
support for a positive relationship between self-efficacy and willingness to accept
challenging goals (Locke & Latham, 1990, 2002). For self-set goals, those with
high self-efficacy have been found to set more challenging goals than those with low
self-efficacy, and for assigned goals, self-efficacy has been positively related to goal
commitment. By broadening the level of challenge an individual sees as within reach
of personal skill levels, self-efficacy has the potential to increase the range of tasks
for which the challenge-skill balance precondition of flow is met. In this manner,
self-efficacy increases the likelihood of experiencing flow across a variety of tasks.
As experience with a given task increases and efficacy perceptions become more accurately refined, the necessity for additional information about task progress and performance is attenuated by knowledge garnered from that previous experience (Gist & Mitchell, 1992). It follows that, as experience accumulates and self-efficacy increases, the perceived need for external task feedback would be reduced. By reducing that perceived need, the flow precondition that task performance feedback be available becomes more easily met. Consequently, as experience and efficacy increase, flow emergence becomes more likely.

Flow, on the other hand, can be expected to enhance efficacy perceptions as a function of its characteristics. Of flow’s established characteristics, four are consistent with increased self-efficacy: action-awareness merging, sense of control, intense task concentration, and a loss of self-consciousness. All four of these elements are consistent with task mastery processes that underlie development of self-efficacy (Bandura, 1997).

The proposed positively reciprocal nature of self-efficacy and flow emergence bears striking similarity to the “upward spiral” described by broaden-and-build theory (Fredrickson, 2001). While broaden-and-build is focused more specifically on the continuity of positive emotional experiences, the theory also details the role of accumulated personal resources as a mechanism for resilience in the face of obstacles. Self-efficacy itself may represent one such personal resource (Salanova et al., 2006) that can effectively buffer against stress and promote well-being (Bandura, 1997). In a broader study of the relationship between flow and the availability of resources (both organizational and personal), Salanova et al. (2006) found support for the reciprocity of flow and self-efficacy. In particular, the authors found that while self-efficacy did indeed predict flow state emergence, the influence of flow on self-efficacy was greater still.

**Flow and job characteristics**

As efforts to integrate flow with the workplace have evolved, exploration of the intersection of flow and Hackman and Oldham’s (1976) job characteristics model (JCM) has begun (Demerouti, 2006; Nielsen & Cleal, 2010). On the surface, the JCM seems to offer an excellent framework for designing jobs to encourage the emergence of flow, as the antecedents of flow essentially describe task characteristics.

The JCM’s core characteristics have conceptual similarity with both the antecedents of flow and elements of the flow experience. Starting with the most similar characteristics, feedback is an essential component in both flow theory and the JCM. In both cases, it includes the availability of task-relevant feedback as a function of performing the task (Csikszentmihalyi, 1990; Hackman & Oldham, 1976). Autonomy, in the JCM, would seem to underlie one’s sense of control during flow, at least to the extent that an individual perceives control over his or her own task-related behaviors. Perceptions of task identity, “the degree to which the job requires doing a whole and identifiable piece of work” (Oldham & Hackman, 2010, p. 464), and task significance are arguably similar to Csikszentmihalyi’s (1990) prerequisite sense
of goal clarity. Even skill variety, “the degree to which the job requires a variety of different activities . . . involving the use of a number of different skills and talents of the person” (Oldham & Hackman, 2010, p. 464), has been argued to be conceptually similar to challenge-skill balance in flow theory (Demerouti, 2006).

Given such similarities, application of the JCM in pursuit of greater flow emergence among employees would seem to be a viable option. Findings regarding the relationship between job characteristics and flow have been mixed, however. While Demerouti (2006) found a positive relationship between the JCM’s formulaic motivating potential score (MPS) and flow, others found that more generic job characteristics (e.g., cognitive demands, influence) were unrelated to flow experiences (Nielsen & Cleal, 2010). Regardless of these minor inconsistencies, the general motivational benefits of enhanced JCM core characteristics and their potential for increasing a job’s capacity for inducing flow make such implementations appealing on both fronts.

**Flow and alternative performance criteria**

In examining the potential relationships between flow and established processes in work motivation theory, it became evident that the complex and dynamic nature of modern work may have implications for the role of flow in understanding work behavior. Several aspects of the flow experience suggest a very high level of concentration and engagement in a specific task, on which workers strive to achieve specific goals, framed in one of several possible ways. These aspects of flow include action-awareness merging, concentration on the task at hand, a sense of control, and loss of self-consciousness (Csikszentmihalyi, 1997). Clearly, workers who are experiencing flow are very focused on a specific task, and tend to filter out stimuli and information that are extraneous to performance of that task. The extent of this concentration is illustrated by another experiential flow characteristic, the transformation of time, in which the perception of time itself is altered, with the sense of time slowing, accelerating, or becoming irrelevant (Jackson & Marsh, 1996).

While this sort of intense engagement in a task may indeed be positively associated with performance on that task, contemporary models of work go beyond consideration of individual tasks when defining work performance. At the most basic level, it must be acknowledged that workers perform multiple tasks, each with its own goal or goals, which need to be monitored simultaneously for effective self-regulation (Lord & Levy, 1994). The sort of intense concentration on, and absorption in, the performance of a single task, as typified by flow, may at best make it difficult for workers to regulate their behavior with respect to other tasks. While it may be the case that there are times when a single task becomes the exclusive focus of a worker’s job, such instances are most certainly the exception in modern society.

The importance of monitoring multiple tasks or objectives is illustrated by the construct of *adaptive performance* (Pulakos, Arad, Donovan, & Plamondon, 2000), which involves the capability to adjust behavior to changing circumstances in the workplace. Adaptability has probably always been an important skill, but as both
the complexity of work and the rate at which jobs evolve have increased in recent decades, not only being able to adapt but also being able to monitor circumstances that cue the need for adaptation have become critical. Pulakos et al. (2000) went beyond the obvious issues stemming from increasingly complex and changing work, and presented a taxonomy of adaptive performance with eight distinct factors. Some of these factors (e.g., handling work stress, solving problems creatively) do not necessarily require ongoing regulation processes, but some of the others do imply a level of vigilance that may be difficult to maintain while deeply immersed in a task (e.g., dealing with uncertain and unpredictable work situations, demonstrating interpersonal adaptability). Of course, while it may be the case that experiencing flow could limit adaptability by reducing self-regulation processes, it is also possible that effects could operate in the opposite direction, with working in an environment that requires a high degree of adaptability limiting the development of flow.

Another alternative criterion of work performance that has received a great deal of attention in the I/O research literature in recent years is citizenship behavior. These are behaviors that are not part of workers’ core task responsibilities, but rather support the environment within which core tasks are carried out (Borman & Motowidlo, 1993; Organ, 1997). Such behaviors as volunteering, persisting with enthusiasm, and helping coworkers when they are in need are common examples of organizational citizenship. Proposed explanations for citizenship behaviors have included social exchange (e.g., Cropanzano & Mitchell, 2005), prosocial dispositional orientations (e.g., De Dreu & Nauta, 2009), and impression management (Rioux & Penner, 2001). Whatever the reasons that workers engage in citizenship behaviors, however, it would seem to be necessary that they regularly monitor the social environment of the workplace in order to be aware of needs or opportunities for citizenship. As with adaptive behaviors, it seems reasonable to speculate that experiencing flow, and the intense absorption in a task that accompanies flow, might limit a worker’s ability to adequately engage in this monitoring. Clearly, the implications for the development of flow of the alternative (nonwork task) performance criteria that permeate the experience of modern workers should be studied and understood more fully.

Conclusion

In this chapter, we have attempted to describe some of possible areas of commonality between established work motivation theories and constructs and Csikszentmihalyi’s (1990) theory of flow. The specific issues that we have raised are far from exhaustive, but illustrate the potential for flow theory to contribute to the understanding of work motivation. We began our discussion by documenting the relative lack of attention that flow has garnered in the I/O psychology literature, which we attributed to a general failure to make explicit links between flow and established work motivation constructs. Increased attention to flow in the mainstream I/O research literature is likely to materialize when the utility of considering flow for better understanding worker motivation and performance has been more fully demonstrated. Flow researchers, however, should take advantage of the vast
existing work motivation literature when considering the motivational implications of workers’ optimal experience. Work motivation is a “mature” area of inquiry, in which current research generally extends and clarifies accepted theories (Schmidt et al., 2013). Flow has the potential to expand our understanding of work motivation when considered in light of these theories.

**References**


Introduction

As shown in the other chapters of this volume, work does not merely represent a means of subsistence; it can be a source of optimal experience, enriching one’s life and contributing to the community prosperity. A growing amount of studies highlight that work is a relevant source of both meaning and opportunities for personal growth and skill development which individuals can seize based on their predispositions, interests, previous experience, and personal goals (Delle Fave & Bassi, 2009; Page & Vella-Brodrick, 2009). Investigating the cultural and individual components of the work experience can thus have important consequences for individuals, communities, organizations, and nations at large.

To this purpose, the present chapter will adopt an integrated theoretical approach, addressing the interplay between cultures and individuals in the phenomenology of flow at work. Based on this framework, we will illustrate findings obtained in diverse cultural contexts, but also across occupations, paying attention to similarities and differences in flow-related tasks and associated quality of experience within the work domain. We will also discuss flow at work in relation to future goals in the long-term perspective of psychological selection (Massimini & Delle Fave, 2000). Finally, we will focus on migration, addressing the role of work in promoting flow, as well as sociocultural adjustment and psychological adaptation.

Culture and psychological selection

According to Bates and Plog (1990), a “culture is a system of shared beliefs, values, customs, behaviors, and artifacts that the members of a society use to cope with their world and with one another, and that are transmitted from generation to generation through learning” (p. 7). This broad definition subsumes two important
aspects of culture that are of interest for our analysis of flow at work. The first one is represented by the structural and historical variations that may be identified within and across cultures. The second aspect refers to the individual's active interplay with the opportunities and values characterizing the cultural environment.

Cultures are meaning-making evolutionary systems, representing sets of rules and values that offer solutions to universal problems related to the biological and cultural survival of individuals and communities (Kluckhohn & Strodtbeck, 1961; Massimini & Calegari, 1979). Work represents one of these problems, which are classified in three main categories: community survival and livelihood; production, circulation, and transmission of cultural information among community members; and development and application of values, rules, and norms that influence the community structure and organization (Massimini & Delle Fave, 2000; Csikszentmihalyi & Massimini, 1985). Work is included within the category of community survival. Although all human communities share the same universal problems, a remarkable variety of solutions can be detected across societies according to ecological, historical, and cultural peculiarities. For example, access to specific jobs may be related to demographic features, such as gender or social status. Variations may also occur in terms of emphasis or priority placed on a given problem with respect to other universal problems. In some countries free health care and education are basic rights of all citizens, independent of their occupation, while in other countries access to learning and/or medical services depends on job position and income. Cultural differences may further emerge according to historical events and processes. Today’s instability in the global economic situation, leading some countries to face financial crises and other countries to thrive (Awad, 2009), poses new challenges to workers, organizations, and professionals who are in charge of well-being promotion at the workplace.

The second important aspect subsumed in the definition of culture reported earlier is that individuals undergo a lifelong learning process of enculturation (Herskovitz, 1948) through which they acquire the values of their community. These values become essential constituents of individuals’ daily experience and behavior: research studies have highlighted the role of cultural values in directing individuals’ attention to environmental and contextual stimuli (Hedden et al., 2002), influencing the expression of personal feelings, and shaping goals and motivations (Markus & Kitayama, 1991). Likewise, a great amount of evidence was gathered on the role of cultures in fostering opportunities for growth and self-expression in daily behavior, as well as the development and cultivation of culturally relevant personal skills (Bond, 2013; Vaalsiner, 2007). However, besides being influenced by culture, individuals are active agents in the interaction with their environment, giving rise to a process that Csikszentmihalyi and Massimini (1985) defined as psychological selection.

Psychological selection results from the individuals’ differential investment of attention and resources in the information available in their environment. In this process, a prominent role is played by two specific factors: the quality of experience associated by individuals to the daily activities and information available to them in
the environment, and the personal long-term meaning they attribute to this information (Delle Fave, 2009). These two factors are often combined. A wide range of studies have highlighted that individuals preferentially cultivate activities, values, and relationships according to their potential association with optimal experience. However, the association of an activity with flow does not guarantee its meaningfulness for the person. People often report optimal experience in recreational leisure that is surely beneficial in the short run, but not relevant to lifelong goals. The dimension of meaningfulness and long-term goals has been recently included in studies on flow (Delle Fave & Massimini, 2005). Cross-cultural findings have highlighted that individuals more frequently report flow in tasks and domains that they perceive as relevant and coherent with their own world outlook, life goals, and core beliefs (Delle Fave, 2007).

The replication of meaningful flow-related activities (or optimal activities) over time has important consequences for single individuals and their communities (Massimini & Delle Fave, 2000; Nakamura & Csikszentmihalyi, 2003). At the personal level, the cultivation of these activities brings about growth in complexity: in order to replicate the experience, the individual will look for increasing challenges and consequently refine the personal skills and abilities necessary to face them (Csikszentmihalyi & Csikszentmihalyi, 1988). From this perspective, optimal experience can also influence individuals’ long-term life trajectories (Delle Fave, Massimini, & Bassi, 2011). At the cultural level, individuals learn and exchange information with others. Through the selection, replication, and transmission of specific optimal activities, each person can contribute to the long-term shaping of her culture, helping to preserve certain values as well as bringing about innovative cultural changes.

Over the last three decades, this broad theoretical framework has guided our investigation of flow across cultures and has been increasingly refined based on constantly incoming empirical evidence (Delle Fave et al., 2011; Massimini & Delle Fave, 2000). In the following paragraphs we will summarize some of the findings collected by our research group on flow in the domain of work, together with results deriving from other research projects.

**Work, values, and meaning**

As briefly outlined in the previous pages, among the universal problems humans have to face, work is recognized as a fundamental concern that contributes to the survival of any community (Massimini & Calegari, 1979). Culture-specific solutions to the work problem have brought about an extensive gamut of economic systems, differently regulating means of production, access to work, and labor division. At the same time, cross-cultural variations exist in the weight attributed to work vis-à-vis other human problems. They can provocatively be reflected in today’s differential investment in work policies, with some nations devoting more resources to war plans than to economic development.

Nonetheless, empirical findings showed that, at the personal level, work universally represents an extremely important value. This result stems from a large
international investigation among participants from seven countries (Delle Fave, Brdar, Wissing, & Vella-Brodrick, 2013). Through the self-report questionnaire Eudaimonic and Hedonic Happiness Investigation (EHHI), participants were asked to report the three most meaningful things in their lives – that is, sources of meaning – and then to explain why each of these things was meaningful to them. As concerns the most meaningful things, work was mentioned by 44% of the respondents, ranking second to family (that was acknowledged as meaningful by 84% of the participants). In particular, and in line with a project-oriented conceptualization of meaning (Emmons, 2005), answers mainly referred to the relevance of work as an opportunity for personal growth, competence development, and satisfaction. Differences emerged among linguistic/cultural groups, identified as Romance, Germanic, and Slavic (Delle Fave, Wissing, Brdar, Vella-Brodrick, & Freire, 2013), with a significantly higher percentage of Romance and Slavic participants providing answers referring to the intrinsic value and meaningfulness of work, while Germanic respondents more frequently quoted satisfaction with work. Globally, however, only a limited percentage of participants referred to the extrinsic value of work, such as job stability and security. Motives underlying the perceived work meaningfulness were in line with these findings. Work was described as a basic constituent of individual life, making life worth living, and giving rise to feelings of personal expressiveness.

Work cultures: a neglected topic in flow research

Work has been identified as a privileged opportunity for optimal experience (Bassi & Delle Fave, 2012; Csikszentmihalyi & LeFevre, 1989; Delle Fave & Massimini, 2003; Hektner, Schmidt, & Csikszentmihalyi, 2007). Previous chapters have summarized research investigating the job conditions and resources favoring flow at work. However, studies were primarily carried out in Western countries, which by and large share similar postindustrial service economies, work histories, and policies, paying little attention to cultural differences, in particular those concerning individualistic versus collectivist features (Hofstede, 1980; Smith & Bond, 1999; Triandis, Chan, Bhawuk, Iwao, & Sinha, 1995), which are reflected – even if not deterministically – in the social structure, including work organization and rules, workers’ rights and duties, job and career opportunities, and income distribution (Kagitçibasi, 1997).

Moreover, even in the case of cross-cultural research, a disproportionately large amount of studies in the work domain involve office employees and factory workers, while other categories of workers are ignored. The two only exceptions are teachers and health professionals, whose work experience has been recently explored in relation to flow (Bakker, 2005; Bassi & Delle Fave, 2012; Bringsén, Ejlertsson, & Andersson, 2011; Delle Fave & Massimini, 2003; Rodríguez, Salanova, Cifre, & Schaufeli, 2011; Salanova, Bakker, & Llorens, 2006). In contrast, traditional work activities, such as farming and handicrafts, but also semiskilled and unspecialized jobs directly related to industry production have been substantially neglected, in spite of the fact
that they represent the basic subsistence means for the vast majority of people and communities on the planet.

It is also interesting to notice that overall in the psychological literature activities such as gardening, farming, arts, and crafts are prominently considered hobbies or rehabilitation practices, and are therefore investigated within the domain of leisure, occupational therapy, and psychiatric and physical rehabilitation (Harris, 2008). Several studies have shown the positive features of the experience associated with handicrafts and their well-being related outcomes among people diagnosed with mental disorders, adopting flow either as a theoretical point of reference for interpreting narratives (Caddy, Crawford, & Page, 2012; Griffiths, 2008; Reynolds, Vivat, & Prior, 2008) or as an empirical measure (Bassi, Ferrario, Ba, Delle Fave, & Viganò, 2012). Studies in occupational therapy have emphasized the positive physical and psychological consequences of participation in arts and crafts to preserve identity, self-esteem, and well-being after retirement (Reynolds, 2009) or after migration (Boerema, Russell, & Aguilar, 2010). This approach is culturally biased, in that it conveys the disguised ideological assumption that workers are per antonomasia company employees, executive officers, or factory workers. Such an assumption is clearly reflected in the common language, in that the term “working class” originally refers to these restricted categories of citizens.

A quick exploration of PsychINFO shows that other disciplines within the social sciences have been paying more attention to farmers and artisans. This is particularly true of anthropology, sociology, and economics. Researchers from these domains have investigated the quality of life and well-being of farmers and handi- craftsmen from a variety of perspectives. Economists have investigated the impact of fair trade practices on these workers’ well-being (Bacon, 2005; Becchetti, Castriota, & Solferino, 2011). Other studies have highlighted the importance of relying on the expertise of farmers and artisans to develop intervention aimed at their well-being promotion (Brookfield & Gyasi, 2009; Doshi, 1990; Nederlof & Dangbëgnon, 2007). Sociologists and anthropologists have focused on the relationship between traditional work and social status, addressing issues related to gender (Prentice, 2012; Soni-Sinha, 2011), ethnic minorities (Portisch, 2009), and cultural transitions (Gowlland, 2012; Karides, 2005; Sayce, Ackers, & Greene, 2007; Wherry, 2008). However, studies exploring the positive work experiences of these populations, including flow, are completely missing.

Empirical evidence of flow at work across cultures and occupations

In order to shed light on the relationship between the specific features of different jobs and flow occurrence, we will now summarize and further analyze the findings obtained from studies conducted by our research group among participants belonging to different western and nonwestern societies and work contexts (Delle Fave et al., 2011).

We will merge results provided by 767 adult participants, 308 women and 459 men, aged 15–78 (average age thirty-five). Among them, 251 (32.7% of the
sample) belonged to nonwestern, prominently Asian cultures: India, Indonesia, Iran, Philippines, West Africa (Ivory Coast and Ghana), North Africa (Morocco and Tunisia), and Somalia. In this sample, thirty-eight Africans and thirty-four Asians were first-generation immigrants living in Italy. This group also comprised sixty Rom Gypsies, settled in Italy but preserving their original language, lifestyle, and values: they lived in camps located in city outskirts, following a separation pattern of acculturation. Nonwestern participants were involved in various jobs: forty-one were craftsmen, nineteen were self-employed as shopkeepers and traders, twenty-four worked as helping professionals (teachers, social workers), seventeen were clerks and finance consultants, sixteen were factory workers, eighteen were employed as housemaids, seventeen were postgraduate and PhD students, sixty-three were housewives, and twenty-seven (twelve African immigrants and fifteen Rom participants) were irregularly employed as nonskilled workers. The western sample comprised 516 Italian participants (67.3% of the sample), living in urban and rural areas, and engaged in a variety of traditional and modern jobs. More specifically, the group included 150 factory workers, sixty-five office employees, seventy production and sales managers, 103 postgraduate students and researchers in the areas of mathematics, physics, and engineering, seventy-eight craftsmen (prominently tailors, knitters, carpenters, goldsmiths, and hairdressers), and fifty weavers running family textile enterprises. Among the factory workers, fifty lived in an area of northwest Italy in which most families integrate wage with the income derived from agriculture; they owned or had rented small land plots, and devoted a relevant part of their time to farming.

Participants were administered the Flow Questionnaire (FQ; Delle Fave & Massimini, 1988) and the Life Theme questionnaire (LT; Delle Fave, 2004; Delle Fave & Massimini, 1988). The FQ consists of both scaled items and open-ended questions inquiring about participants’ flow experience. In particular, participants are asked to read quotations describing optimal experience, to report whether they have ever had such experience, and, if so, to list the associated activities. Participants are then invited to select from their list the activity associated with the most intense and pervasive flow states, and to rate the related experience on 0–8 scaled items. Items investigate the levels of challenges and skills perceived in the situation, as well as the level of cognitive, affective, and motivational variables: involvement, wish to do the activity, excitement, ease of concentration, enjoyment, concentration, relaxation, control of the situation, perception of clear feedback from the ongoing task and of clear goals in performing it (Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988). The LT expands the focus on participants’ psychological selection, posing a number of open-ended questions about positive and negative life influences, current challenges, future goals, and major life accomplishments.

Data analysis highlighted specific features of flow activities and experience across cultures and professions. Overall, the activity categories associated with flow were substantially similar among western and nonwestern participants. The majority of answers referred to leisure activities and productive tasks, and this trend was confirmed in the distribution of the prominent optimal activities selected by the participants.
As reported in Table 9.1, work (including paid jobs, as well as unpaid activities at home) and leisure (comprising sports, hobbies, reading, and media use) largely predominated. A significant between-group difference was, however, detected concerning leisure, quoted by a lower percentage of nonwestern participants (Fisher’s exact test = 0.0069). This difference, consistent with previous studies (Delle Fave et al., 2011), can be related to cultural variations in the amount of time devoted to work and leisure, and in the availability of leisure opportunities. It can be also connected to different conceptualizations of work and leisure (Delle Fave & Massimini, 1988; Csikszentmihalyi, 1990): for example, in traditional contexts work activities are often not restricted to specifically identified spaces and timetables; they can be shared with other family or community members, thus allowing for development and implementation of social connections, and they serve a variety of needs, ranging from biological survival to competence development and self-actualization (Delle Fave & Bassi, 2014). By contrast, in industrial and postindustrial societies work activities primarily take place in well-defined space and time compartments, becoming synonymous with duty and constraint. People prominently look at work as instrumental to earn a living, whereas the preferential domain to pursue full self-actualization is represented by leisure, through which one can express and develop personal talents and competences, and engage in creative activities.

**Table 9.1** Percentage distribution of the activity categories associated with the most pervasive optimal experiences

<table>
<thead>
<tr>
<th>Activity categories</th>
<th>Western N(^a) (%)</th>
<th>Nonwestern N(^a) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>141 (32.19)</td>
<td>77 (36.32)</td>
</tr>
<tr>
<td>Study</td>
<td>31 (7.08)</td>
<td>14 (6.60)</td>
</tr>
<tr>
<td>Volunteering</td>
<td>5 (1.14)</td>
<td>1 (0.47)</td>
</tr>
<tr>
<td>Social relations</td>
<td>16 (3.65)</td>
<td>5 (2.36)</td>
</tr>
<tr>
<td>Leisure</td>
<td>202 (46.12)</td>
<td>74 (34.90)</td>
</tr>
<tr>
<td>Family interactions</td>
<td>29 (6.62)</td>
<td>22 (10.38)</td>
</tr>
<tr>
<td>Thoughts, introspection</td>
<td>5 (1.14)</td>
<td>8 (3.77)</td>
</tr>
<tr>
<td>Religious practices</td>
<td>6 (1.60)</td>
<td>10 (4.72)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (0.69)</td>
<td>1 (0.47)</td>
</tr>
<tr>
<td>Total N</td>
<td>438 (100.0)</td>
<td>212 (100.0)</td>
</tr>
</tbody>
</table>

\(^a\) N of participants (each participant could select only one flow activity)

Flow and the work paradox: recurrent phenomenon or job-related feature?

Differences between work and leisure as perceived opportunities for flow were identified by other researchers as well. These differences emerged in particular as concerns the features of the flow experience associated with these two domains.
Several studies highlighted that, during work, flow is characterized by significantly high values of cognitive variables (e.g., concentration, control of the situation, clear feedback from the activity), and perceived clear goals; however, variables related to affect (e.g., enjoyment) and intrinsic motivation (e.g., wish to do the activity) score below or around average (Csikszentmihalyi & LeFevre, 1989; Haworth & Hill, 1992; Rheinberg, Manig, Kliegel, Engeser, & Vollmeyer, 2007). This phenomenon was defined as the work paradox.

The work paradox also emerged from the studies conducted by our research group (Delle Fave & Massimini, 2005) and from the data presented here. As shown in Table 9.2, a comparison between flow at work and flow in other activities highlighted that, at the motivational level, work was associated with significantly higher values of goal pursuit, but with lower values of intrinsic desirability. However, this was true only of western participants. The detection of this cultural difference led us to further explore the findings, taking into account the potential role of the specific work tasks selected by the participants in shaping their flow experience. The job variety that characterizes our sample allowed us to analyze flow experience at work across occupations. This decision was also based on evidence obtained in previous studies (Bassi & Delle Fave, 2012; Delle Fave & Massimini, 2003), showing

<table>
<thead>
<tr>
<th>Western participants</th>
<th>Nonwestern participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work</strong> (N=141)</td>
<td><strong>Other</strong> (N=297)</td>
</tr>
<tr>
<td><strong>M (SD)</strong></td>
<td><strong>M (SD)</strong></td>
</tr>
<tr>
<td>Involvement</td>
<td>6.6 (1.3)</td>
</tr>
<tr>
<td>Clear feedback</td>
<td>7.0 (1.3)</td>
</tr>
<tr>
<td>Wish to do the activity</td>
<td>6.9 (1.6)</td>
</tr>
<tr>
<td>Excitement</td>
<td>7.5 (1.1)</td>
</tr>
<tr>
<td>Ease of concentration</td>
<td>5.9 (2.5)</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>6.9 (1.4)</td>
</tr>
<tr>
<td>Concentration</td>
<td>6.6 (1.6)</td>
</tr>
<tr>
<td>Relaxation</td>
<td>6.2 (2.2)</td>
</tr>
<tr>
<td>Clear goals</td>
<td>7.3 (1.2)</td>
</tr>
<tr>
<td>Control of situation</td>
<td>6.8 (1.4)</td>
</tr>
<tr>
<td>Challenges</td>
<td>6.7 (1.3)</td>
</tr>
<tr>
<td>Skills</td>
<td>6.8 (1.3)</td>
</tr>
</tbody>
</table>

*N of participants
that among highly skilled professionals, such as teachers and physicians, the levels of intrinsic motivation and activity desirability associated with work tasks are high and not significantly different from those reported in other flow activities. The work paradox thus does not seem to apply to these professional categories.

Moving from these premises, we investigated which particular work activities were selected as occasions for the most pervasive optimal experiences by the participants in our widely heterogeneous sample.

As reported in Table 9.3, a significantly higher percentage of both western and nonwestern participants (68.1% and 83.1% respectively) prominently referred to traditional work, such as farming, handicrafts, and housework (mainly cooking and sewing), while modern office and factory work were selected by a minority of participants in both groups (Fisher’s exact test = 0.0168). As shown in Table 9.3, during traditional work activities flow was characterized by higher values of affective variables (excitement, enjoyment, and relaxation), and by a more autonomous pattern of behavioral regulation (wish to do the activity and effortless concentration). These results suggest that the work paradox can be a characterizing feature of factory and office work, which indeed represent the vast majority of the occupations in which this phenomenon was detected and subsequently confirmed in the flow literature.

These results also provide additional insight into the separation between work and leisure domains characterizing industrial and postindustrial societies (Parker, 1997). Such separation surely calls into play social and organizational factors, but also psychological ones. In particular, in traditional societies work provides individuals

| TABLE 9.3 Optimal experience during traditional and modern work activities |
|--------------------------|--------------------------|--------------------------|--------------------------|
|                         | Traditional work (N=160) | Modern work (N=58) | Z (p) |
|                         | M (SD)                    | M (SD)                |      |
| Involvement             | 7.0 (1.3)                 | 6.7 (1.4)             |      |
| Clear feedback          | 7.3 (1.1)                 | 6.9 (1.6)             |      |
| Wish to do the activity | 7.2 (1.5)                 | 6.3 (1.9)             | Z=3.0, p <.003 |
| Excitement              | 7.7 (0.8)                 | 7.2 (1.4)             | Z=3.0, p <.003 |
| Ease of concentration   | 6.7 (2.0)                 | 5.6 (2.7)             | Z=2.7, p <.007 |
| Enjoyment               | 7.3 (1.1)                 | 6.8 (1.6)             | Z=2.1, p <.04  |
| Concentration           | 6.9 (1.5)                 | 6.7 (1.6)             |      |
| Relaxation              | 6.9 (1.7)                 | 5.7 (2.5)             | Z=3.1, p <.003 |
| Clear goals             | 7.5 (1.1)                 | 7.3 (1.3)             |      |
| Control of situation    | 7.1 (1.2)                 | 6.7 (1.5)             |      |
| Challenges              | 6.7 (1.5)                 | 6.7 (1.4)             |      |
| Skills                  | 6.8 (1.4)                 | 6.7 (1.4)             |      |

aN of participants
with opportunities for flow experiences that are globally optimal, at the cognitive, affective, and motivational levels. Traditional activities clearly differ according to the local cultural heritage, but they all present common characteristics of complexity and challenge. They require dexterity and imply a definite visible outcome (a crop, a woolen sweater, a carved table). In modern jobs, the standardization of behavior and of its products inevitably leads to restrictions in individual initiative and to a decrease in the variation of activity structure and outcomes. Consumption prevails on transformation and effective use of environmental resources (Oskamp, 2000). By contrast, creativity, autonomy, and skill development favor optimal experiences at work (Delle Fave et al., 2011).

These considerations are further supported by a closer examination of the flow activities selected by a subsample of the western workers, sharing the same cultural background but involved in different occupations, such as office and factory work, handicrafts, and weaving (Table 9.4). Although the vast majority of participants in all groups (ranging from 74 to 91%) reported optimal experiences in their lives, the percentage of participants associating work with the most pervasive flow experiences steadily declined from 58.2 for artisans to 15.3 for clerks. The predominance of traditional work activities among factory workers is due to the answers provided by participants who, besides their daily job as blue collars, derived part of their income from farming, classified as traditional work. Among women employed as factory workers, clerks, and executives the traditional work activities associated with flow prominently included cooking.

The better quality of experience reported by participants during traditional work tasks can be finally related to the value of these activities in relation to personal and cultural meanings. Traditional jobs are often transmitted by parents or relatives, thus contributing to the preservation and strengthening of family ties, as well as of the workers’ personal and cultural identities (Nelson, LaBat, & Williams, 2005).

**Work-related goals: a key component of psychological selection**

As reported in Table 9.2 and Table 9.3, the experience associated with work is overall characterized by high values of perceived goals across job categories. Pursuing clear goals through the task at hand thus represents a core component of flow at work. The table below shows the distribution of traditional and modern work activities selected as occasions of pervasive optimal experiences across occupations.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Artisans</th>
<th>Weavers</th>
<th>Factory workers</th>
<th>Executives</th>
<th>Clerks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional work</td>
<td>38 (56.7)</td>
<td>18 (48.6)</td>
<td>36 (26.2)</td>
<td>2 (3.7)</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Modern work</td>
<td>1 (1.5)</td>
<td>1 (2.8)</td>
<td>21 (15.4)</td>
<td>14 (25.9)</td>
<td>7 (11.9)</td>
</tr>
<tr>
<td>Total flow</td>
<td>39 (58.2)</td>
<td>19 (51.4)</td>
<td>57 (41.6)</td>
<td>16 (29.6)</td>
<td>9 (15.3)</td>
</tr>
<tr>
<td>Total flow</td>
<td>67 (85.9)</td>
<td>37 (74.0)</td>
<td>137 (91.3)</td>
<td>54 (77.1)</td>
<td>59 (90.8)</td>
</tr>
</tbody>
</table>

*N of participants (each participant could select only one flow activity)
work. Moving from the momentary experience to the long-term perspective, the specific role of work-related goals in orienting the lifelong process of psychological selection was investigated in the present sample through the LT, by inviting participants to list their most important future goals. As shown in Table 9.5, 44.1% of the participants in the total sample identified work as a relevant goal. This percentage included both people who associated work with pervasive flow experiences and people who did not. These results were confirmed also when the analyses were run on the western and nonwestern subgroups separately. They suggest that the association of work with flow is not a necessary prerequisite to the identification of work as a goal.

These findings are consistent with those obtained through the Eudaimonic and Hedonic Happiness Investigation, described in the previous pages (Delle Fave, Wissing, et al., 2013), in which work was acknowledged as a prominent future goal, second only to family, by participants across countries. The role of work as a component of psychological selection can thus be related – on the one hand – to the complex structure of some jobs and their potential in fostering flow through the recruitment of individual attention and concentration. On the other hand, the manifold roles of work in the lifelong perspective – as a culturally shared value, as a means to satisfy family needs, and as a major pathway to achieve social integration – can further strengthen its relevance for individual well-being (when it is associated with flow) or counterbalance its structural and experiential limitations (when it is not associated with flow).

### Migration and work: promoting integration through flow

In the last few decades the number of people leaving their native countries in search of better life opportunities abroad has steadily increased. Finding a job is the first step to settling down and earning a living in the new land. In the migration process, individuals carry cultural values that deeply shape their expectations, adjustment opportunities, and well-being in the new country. The new environment poses a number of challenges, first of which is acculturation – that is, the process of change...
in collective and individual behaviors that allows a minority group to interact with the norms and habits of a dominant social system (Berry & Sam, 1997).

Among the various acculturation strategies that have been identified (Berry, 1997), the most adaptive one is integration, through which acculturating individuals acquire values and behaviors of the dominant culture while preserving their own traditions and habits. This strategy fosters flexibility and complexity in both individuals and cultural systems (Delle Fave & Massimini, 1999).

A prerequisite of integration is sociocultural adjustment (Ward, 2001), by which migrating individuals acquire new skills and behaviors through learning and interaction with host citizens. Key predictors of sociocultural adjustment are the length of residence in the new country, the relationships with host nationals, the immigrant status (having a residence permit versus being “illegal”), and the education level (Ward & Kennedy, 1994; Zlobina, Basabe, Paez, & Furnham, 2006). Integration is also related to psychological adaptation (Searle & Ward, 1990) – namely, individuals’ emotional well-being, satisfaction, and self-actualization.

In this domain, research has primarily focused on the mental and psychosomatic disorders related to migration (Finch & Vega, 2003; Kazarian & Evans, 2001), while a much more limited amount of studies have explored the positive consequences of migration on perceived well-being (Jasinskaja-Lahti, Liebkind, Jaakkola, & Reuter, 2006; Phinney, Horenczyk, Liebkind, & Vedder, 2001). Among them, the studies conducted by our research group on flow among immigrants cast some light on this complex social and psychological phenomenon.

Migration indeed represents a fracture in individual daily habits and life trajectory. As concerns flow, migrants may not be able to practice the activities they associated with optimal experience in their native country. Nevertheless, the host environment can provide new challenges, and thus new opportunities for flow that can contribute to individuals’ well-being and successful acculturation (Delle Fave et al., 2011; Fianco & Delle Fave, 2006). Results derived from first-generation immigrants settled in Italy from African, Asian, and Latin American countries, as well as from Eastern Europe (Delle Fave & Bassi, 2009), underlined the role of the sociocultural components of adaptation in providing participants with opportunities to experience flow. More specifically, and consistent with previous studies (Zlobina et al., 2006), length of stay in Italy, immigrant status, cultural distance between the homeland and the hosting country, and support from a social and family network played a crucial role in this process. In addition, a pervasive component of sociocultural adaptation that emerged from our study was access to job opportunities.

Although participants’ main reason for migration was search for a job and higher standard of living for themselves and their families, not all of them had achieved this goal at the time they were enrolled in our study. Moreover, many participants who could rely on a stable job – especially women from South America and Eastern Europe – were occupied in activities characterized by lower skill complexity and social status, compared to those they practiced in their homeland. This problem is relatively common among migrants, and especially among women (Suto, 2009). They are often employed in unskilled and part-time jobs, but they also frequently
leave to their husbands the role of family earners, investing their resources in family responsibilities and domestic chores (Meares, 2010; Purkayastha, 2005). This decision is partially related to the financial constraints that prevent immigrant families from getting domestic help to manage housework and daily parental commitments.

In spite of these constraints, many of the participants were able to exploit their jobs to acquire competences and build interpersonal relations facilitating their integration process at the linguistic, social, and cultural levels. This was, however, not true of the African men included in the study, who earned a living through precarious and temporary occupations not only different from the traditional work activities they performed at home, but also low in complexity and requiring unspecialized skills, thus preventing these participants from building new competencies or refining existing ones. These differences in employment status were reflected in the perceived opportunities for flow at work. While Indians, South Americans, and Eastern Europeans prominently associated optimal experience with work tasks, leisure was the major flow domain for Africans.

Although most participants’ work conditions were far from being adequate, the results deriving from their answers to the Life Theme questionnaire showed that work was globally perceived as an important current challenge and future life goal. However, Africans quoted as their prominent goal finding a stable job in the short term, whereas participants in other groups – who had already achieved a relatively stable job position – mentioned long-term objectives, such as career advancement or improvement of work conditions. For African participants finding a job represented a means to satisfy basic survival needs, a substantial prerequisite to pursue the more complex and autonomously regulated goals identified by the other immigrants (Sheldon, Ryan, Deci, & Kasser, 2004).

Further evidence concerning, on the one hand, the role of work features in shaping flow experience and, on the other hand, the manifold role of work for migrants comes from the data collected among two groups of women working in Italian hospitals as registered nurses, thirty-one Italians and twenty-five Eastern Europeans. The large majority (fifty-two, 92.9%) reported flow in their lives. Out of them, fourteen participants (26.9%) selected their job as opportunity for pervasive optimal experiences; however, most of them belonged to the migrant group (ten participants, 41.7% of the twenty-four Eastern Europeans who identified flow in their lives), while only four were Italians (14.3% of the twenty-eight participants reporting flow in this group). This difference was statistically significant (Fisher’s exact test = 0.0332). As concerns the features of optimal experience reported at work and during other activities, the findings presented in Table 9.6 confirm previous studies suggesting that the work paradox does not apply to highly complex and socially relevant jobs. For these nurses, optimal experience at work was characterized by significantly higher levels of concentration and lower levels of relaxation, compared with flow in other activities.

These findings are consistent with those obtained in a recent study conducted among Finnish health professionals (Vivoll Straume & Vitterso, 2012), showing that complex work tasks promote eudaimonic dimensions of well-being – such as
inspiration and absorption. They also confirm the potential of work in promoting well-being after migration, especially when job opportunities are adequate to the migrants’ skills and competences.

No cultural difference was instead detected in the percentage of nurses reporting their job as a long-term goal (45.2% of the Italians and 32% of the Eastern Europeans). This result further supports the findings derived from the international studies described in the previous pages, showing the long-term role of work as a component of the psychological selection process, not necessarily related to its association with flow.

**Conclusions**

Work represents a highly challenging research topic in psychology, due to the variety of its manifestations, and its manifold valences at the individual, social, and cultural levels. In this chapter we attempted to illustrate some of the aspects of work that support its role in the promotion of individual and community well-being, with specific reference to its potential in fostering flow and long-term goal setting.

We have also highlighted some of the still unexplored areas in the domain of work psychology. In particular, very little information is presently available on the work experience of people involved in traditional activities, such as farming and handicrafts, while researchers have privileged studies conducted among employees working in factories and tertiary sector companies, in which office and automated

<table>
<thead>
<tr>
<th>Table 9.6: Optimal experience associated with work and other activities among nurses from Italy and Eastern Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work (N=14)</strong></td>
</tr>
<tr>
<td><strong>M (SD)</strong></td>
</tr>
<tr>
<td>Involvement</td>
</tr>
<tr>
<td>Clear feedback</td>
</tr>
<tr>
<td>Wish to do the activity</td>
</tr>
<tr>
<td>Excitement</td>
</tr>
<tr>
<td>Ease of concentration</td>
</tr>
<tr>
<td>Enjoyment</td>
</tr>
<tr>
<td>Concentration</td>
</tr>
<tr>
<td>Relaxation</td>
</tr>
<tr>
<td>Clear goals</td>
</tr>
<tr>
<td>Control of situation</td>
</tr>
<tr>
<td>Challenges</td>
</tr>
<tr>
<td>Skills</td>
</tr>
</tbody>
</table>

*N participants (each participant could select only one flow activity)*
tasks are prominent. The international economic crisis affecting large productive sectors (from industries to public services, finance, administration, and consulting) and the increasing dissatisfaction with the rhythms and rituals of postindustrial life manifested by citizens of affluent countries are bringing this neglected issue back to the attention of psychologists. Gardening, handicrafts, and creative activities are becoming increasingly popular as ways to escape the constraints of daily life, but also as opportunities to strengthen individual identity and social belongingness, and to identify new sources of income and survival (Dickie, 2003; Jalas, 2006). Yet psychologists pay very little attention to the job and life experience of the millions of people who, not only in distant countries and cultures but also in Europe, Northern America, and Australia, invest their skills and resources in agriculture, handicrafts, and other traditional occupations. The investigation of these topics, however, requires broadening the “work culture” notion, and reintegrating in it a remarkable though neglected component: the “workmanship of risk” (Schwalbe, 2010), as opposed to the “workmanship of certainty,” that today’s crisis calls into play. The former is related to the openness needed in the craft practice (referred to both material and intellectual creations), which entails a creative and flexible interaction with both the raw materials and the tools used to transform them into products – be they objects or symbolic outcomes. The latter is related to the faithful reproduction of material or intellectual objects, following specific rules that guarantee the outcome quality and characteristics. This expansion in perspective is indeed necessary if we want to successfully cope with the new challenges that the growing number of unemployed and disaffected workers is posing to psychology researchers and clinical practitioners.

From a different perspective, the international economic crisis severely affecting the industrial sector entails serious consequences for the blue-collar workers directly employed in production tasks. Yet, within the broad domain of modern jobs, this category of workers is substantially neglected by psychologists, in spite of its key role in the industrial productivity chain. In the light of the social and economic transformations taking place worldwide, a fairer and more exhaustive investigation of the diversity of problems and resources characterizing the work context cannot be further postponed.

References


What is work?
The question seems purely rhetorical – immersed as we are everyday in the hustle and bustle of workers around us, from the sanitation truck loading our trash at dawn to the waitresses in the restaurant at night; and in between these our own work at desks or in schools, hospitals, construction sites, or boardrooms – we certainly know what work is. Yet as with many other aspects of life, familiarity with a given phenomenon does not imply understanding it. So is it with work: generally we assume that it is a necessary evil one has to put up with, something to get rid of as soon as possible so we can enjoy ourselves doing something else – watching TV, playing an electronic game, or, if nothing better is available, gazing outside the window.

Most scientific analysis of the work experience, conducted by psychologists or sociologists, takes the existence of work as a given, and tries to understand how it affects the individuals who are doing it. Until recently, however, little systematic attention has been paid to what is actually meant by “work.” In this chapter, we shall start by taking a closer look at some of the characteristics that make work either a positive or a negative human experience, before considering suggestions for implementing conditions leading to more positive work experiences.

First of all, work is not a stable, unchanging process. Under favorable conditions it can be the best part of life; under badly designed social conditions it can be an almost unendurable burden. We do not have any way of knowing how our ancestors living 20,000 years ago or earlier experienced work. But the work of anthropologists who have observed contemporary groups of hunter-gatherers have often remarked that in these “primitive” societies men and women seem to enjoy whatever work they have to do to survive – and that for them, the distinction between what we would call “work” and what we would call “leisure” – such as dancing,
playing music, telling stories around the campfire – was practically nonexistent (Evans-Pritchard, 1974; Sahlins, 1972; Turnbull, 1961). A man on a hunt did not think of himself as living any differently than when he was beating the drums at the evening dance. Both the “work” and the music were expressions of different aspects of his selfhood, motivated by real needs he could not help feeling.

It took a long time for work to become an alienated experience. What made it so was the evolution of technology that allowed people to accumulate food like grains and cereals, which could be stored without spoilage; in turn, this allowed some sections of the population to become full-time soldiers, others to farm full-time, or to become masons, carpenters, servants, and scribes. Society turned from a democratic group made of people who all did the same thing for a living to an increasingly differentiated workforce held in place by the armies of despotic tyrants.

As technologies advanced, so did opportunities for the exploitation of labor. Some of the worst cases occurred during the Industrial Revolution of the eighteenth and nineteenth centuries, when the small farmers and craftsmen of England, Germany, the United States, and pretty much elsewhere in the “developed world” were no longer able to make a living selling their products against the bigger and faster machines that took over the economy. It was quite usual for a former farm-boy not quite eight years old in Manchester in the 1700s to have to get out of bed by three or four in the morning, rush to the cotton-mills without breakfast, and then work for ten or twelve hours, stoking the furnaces that provided steam for the mechanical weaving looms. If the boy was lucky, he lived to become a man; however, for him “work” would remain anathema forever (Scitovsky, 1976; Thompson 1963).

Fortunately, the labor movements across the industrialized world eventually redressed some of the most inhuman aspects of this situation. It still exists in countries recently colonized by the expansion of the capitalist economy, like Indonesia or the Philippines. But by and large, even though most of the workers of the industrial world cannot experience their work as an extension of what is best in themselves – as a hunter or a farmer could – the conditions under which they work are immeasurably better than what they have been in some of the worst periods of human history.

In reality some of the most satisfying and meaningful moments of life happen when we are working (Csikszentmihalyi, 2003; Csikszentmihalyi & LeFevre, 1968). The reason for it is not difficult to find. Living organisms are built for extracting energy from the environment, and when they are allowed to do it well, they usually feel a deep sense of satisfaction, or even enjoyment. Bees living in a mountain meadow full of flowers might lazily flit in the sun, while still filling their hive with fine nectar. An arctic wolf might have to travel exhausting trails for many days and never find any food that it needs for its survival. But no matter how hard an animal has to work, it is difficult to say that it finds the struggle stressful or boring. In fact, most animals – at least those that are close enough to us to observe and interpret – are at their best when engaged in what we would call “work” – that is, when they practice the activity that makes it possible for them to survive.
Thinkers across the ages have remarked that living things are at their best when they do what they specifically adapted to do. The poet and philosopher Dante Alighieri expressed this idea best, about 700 years ago:

> For in every action . . . the main intention of the agent is to express his own image; thus it is that every doer, whenever he does, enjoys (delectatur) the doing. Because everything that is, desires to be, in doing the doer unfolds his being, and so enjoyment naturally follows.
>
> (Alighieri, 1921 [1317] Book 1, Chap. 13, our translation)

In a less poetic vein, the recently developed discipline of positive psychology is reaching similar conclusions. Individuals have different strengths – twenty-four according to Peterson and Seligman (2004) – and when they are using their strengths they not only are more efficient but also feel more positive moods. A good example was quoted in the recent obituary of Richard Grossman, a physician specializing in the treatment of burn victims, whose “fierce dedication” to his work and the new techniques he developed for alleviating the pain of his patients had become legendary. When he was asked what led him to become so addicted to such grueling work, he did not mention the good he was accomplishing, but simply answered, “You develop a skill, and you want to use it” (Nelson, 2014). Dante Alighieri would have understood. But this is true not only of professionals or other fortunate individuals. People involved in seemingly simple farming chores, who apparently would have very little to enjoy about their work, are often as eloquent about what they do for a living as a poet or a physician. “I still take care of the cows and tend the orchard,” says a sixty-two-year-old woman living in the Italian Alps. “I feel special satisfaction in caring for the plants: I like to see them grow day by day. It is very beautiful.” Or, a fifty-year-old farmer from the same village: “For me to work means taking care of the fields and the animals. Especially the animals . . . I had other jobs in France, but I am glad I came back . . . I like to be close to them. It gives me a lot of satisfaction” (Delle Fave & Massimini, 1988, p. 197, 199).

And yet, surveys around the world keep showing that “work” is often disliked and rarely found satisfying by most adults. Despite improved working conditions, something is still clearly lacking. It is still very rare for workers to feel that their job is an expression of their best qualities, that it is a meaningful activity, that it is fun.

Where can we look for ideas that can change this state of affairs?

### Reconstructing enjoyable work

Autonomy at work has emerged as one of the main variables responsible for positive organizational outcomes. Self-determination theory (SDT; Ryan & Deci, 2000) and the job characteristics model (Hackman & Oldham, 1975) both include it as a component of their respective models. In terms of self-determination theory, autonomy is included as a basic component of motivation along with relatedness and competence. The theory has been productively used as a basis and justification in
many organizational studies seeking to unravel the connections between individual motivation and positive organizational outcomes (Gagné & Deci, 2005; Greguras & Diefendorff, 2009; Ryan & Deci, 2000).

The job characteristics model provides a framework for thinking about the relationship that connects individuals to the specific characteristics of jobs. Autonomy is one of five characteristics that Hackman and Oldham include in their model. Nielsen and Cleal (2010) showed that the core job characteristics included in the job characteristics model—including autonomy—are positively related to work-related flow. Additionally, Saavedra and Kwun (2000) have linked autonomy to positive affect at work, and Fried and Ferris (1987) have made a connection between autonomy and motivation. Autonomy orientation and autonomy support within an organization have also been linked to an increase in prosocial activities (Gagné, 2003). More generally, Demerouti (2006) has shown that motivating job characteristics (including autonomy) are positively related with flow at work and that conscientiousness moderates the relationship between flow at work and job performance.

While there are certainly individual differences that make autonomy more salient to some people than to others (Ryan & Deci, 2006), it has been well established that it is often a vital trait of engaged, motivated, and productive employees (Spector, 1986; Stone, Deci, & Ryan, 2009). In addition to the support offered by several decades of organizational psychology research, the importance of autonomy is spreading across the public consciousness as well. Several organizational trends highlight its importance across industries. For example, many companies are embracing the cost-saving benefits of remote and virtual teams. Allowing employees to work from home and utilizing information technology that makes immediate communication among dispersed teams possible help companies attract the best talent. For many employees, the option of working from home full- or part-time is a crucial consideration when looking at available jobs. Even within more traditional organizations there has been a movement toward self-managing teams, open floor plan offices, and results-only work environments (ROWE)—all of which place a greater focus on autonomy in making decisions about work.

There is also a growing class of workers who are forgoing traditional employment entirely and crafting independent careers built around their own entrepreneurial efforts. Entrepreneurship is growing in popularity, as success stories like Facebook and the start-up culture of Silicon Valley convince more and more people to try building their own product or service instead of working for someone else. Even freelancing, traditionally viewed as the unfortunate result of a weak labor market or the inability to land a full-time job, is becoming an important part of the economy and a career many people are consciously choosing and embracing. In each of these cases, increase in autonomy is perhaps the hallmark characteristic that best describes the reason why this is happening in each of these organizational activities.

The impulse may be to assume that an increase in autonomy across the board, from traditional employees and organizational structures to the growth of independent work, is an unquestionable step in a positive direction. As Deci and Ryan
have clearly articulated in their SDT, autonomy (along with relatedness and competency) is one of the key motivational factors. However, one should also analyze the flip side of this expansion in autonomy. By definition, greater autonomy means a reduction in supervision and management. In a world where workers are given more autonomy and responsibility can productivity be kept high, quotas met, and standards maintained? If greater autonomy leads to more motivated and productive employees, then why hasn’t this change happened already?

It’s obviously a gross oversimplification to view an increase in autonomy as a cure-all for organizational and economic woes. There is a necessary role for management, leadership, and supervision in most, if not all, industries. However, the increase in autonomy that is being viewed across the spectrum of productive activity, from self-managing manufacturing teams to white-collar telecommuters working from home offices, to entrepreneurship, and to the individuals selling their experience and skills on a shifting basis as freelancers, cannot be denied. How can this trend be effectively used to not only increase work and life satisfaction of workers but also allow organizations to be productive and profitable? Do these two forces, employee well-being and profitability, have to be in opposition to each other?

In a world where autonomy is moving toward a more primary role in the way we think about how jobs and organizations are structured, we are suggesting that flow will play a growing and important role. Workers who are given more autonomy in the way they approach and complete their work will have more control over how they can find flow at work. Some who enjoy working alone will have a chance to do so; those who enjoy working early in the morning can wake up early and quit at midday; those who hate some aspect of their job might have a chance to delegate it to someone who enjoys doing it.

Workers who are in control of how to do their job are likely to spend more of their time at work in flow, be more engaged in what they do, and work at their peak capacity. Being in flow while doing your primary job is likely to set off a positive cascade where increasing challenges must be found to match increasing skills. This constant positive pressure is what should keep productivity high, quotas and standards met, and workers satisfied, happy, and committed to their organizations. Very simply, a fully engaged worker is not looking to shirk responsibilities, steal time from the organization, or otherwise find ways to cut corners. When it becomes a flow experience, work becomes more like a game – a game where cheating is not an option, because it would destroy the point of the activity. Challenges are sought, skills are consciously developed, and job tasks and responsibilities are tweaked to allow individuals to lose themselves completely in the task at hand.

The growing trend of autonomy in the workplace may be a major contributing factor to people finding work fun again. With flow rising to an increased level of importance as part of a more autonomous work style, what is the role of the organization in this new reality? One could be tempted to simply argue that an organization that wants to harness the best of its more autonomous employees must simply get out of the way and let them do what they must to find greater flow in work. However, that would be an oversimplified way to conceptualize the role of
the organization. Instead, organizations can take active roles in providing the environment, resources, and support that allow workers to find flow more easily.

To start, this could simply be providing professional development opportunities to teach employees about how to find enjoyment in their work. The first step to employees finding more flow in work is increasing their understanding of what it is and how to find it. Secondly, organizations can explicitly support employees by talking about flow-inducing and flow-blocking components of the work during performance reviews and other opportunities where managers or leaders can hear from employees. Managers can help employees figure out ways to overcome the parts of their job that seem to be resulting in boredom, anxiety, or any other negative states. Finally, organizations can provide the resources to allow employees the opportunity to develop their skills and provide more challenging opportunities. A likely consequence of being in flow is that the skills of employees will constantly grow. In order to remain in flow, employees need to have greater challenges on which they can utilize their increasing skills. Organizations that fail to provide for the growth of their employees will likely experience an unmotivated workforce as boredom and apathy set in.

Building flow into the future of work

We know that work is trending toward greater autonomy in many different ways. Traditional organizations are frequently adopting flatter hierarchies and giving real decision-making authority to self-managing teams. Outside the world of organizational work, independent workers, such as freelancers, solopreneurs, and contractors, are creating viable and rewarding careers. Given this increase in autonomy across various work modalities, how can individuals use flow theory to increase their well-being at work?

This question falls under the purview of job crafting research. Job crafting refers to the idea that individuals can deliberately and consciously alter their jobs in ways that align better with their skills and interests (Wrzesniewski & Dutton, 2001). A robust body of research has emerged from this initial idea, with researchers investigating the role personality plays in predicting job crafting behaviors (Bakker, Tims, & Derks, 2012), the impact of job crafting on the proactive behaviors of dyads (Bakker, Rodriguez-Muñoz, & Sanz Vergel, 2016), the relationship between job crafting and job performance (Tims, Bakker, & Derks, 2015), its impact on meaningfulness (Berg, Dutton, & Wrzesniewski, 2013) and work engagement, to name but a few areas of inquiry (Tims, Bakker, Derks, & van Rhenen, 2013). The goal of this chapter is not to comprehensively review the extant job crafting literature but to simply ask about the inevitable importance of this concept in the highly autonomous future we are both predicting and already observing. What does job crafting based on flow look like in a world where workers have ever-increasing autonomy over the what, where, and how of work?

There are three major components to keep in mind when trying to create the possibility of finding flow in any activity: clear goals and a sense of progress, prompt
and appropriate feedback, and a balance between challenge and skill (Csikszentmihalyi, 1990). Having clear goals allows an individual to have a sense of purpose while working. Immediate feedback allows for the adjustment of effort toward an overall sense of progress. Finally, the balance between challenge and skill allows an individual to work without entering the realm of anxiety (when the situation is more challenging than the current skill level will tolerate) or boredom (when the situation is less challenging than the current skill level). In the world of highly autonomous work, individuals have control over how they approach and structure their work and environment to support these three conditions of the flow experience.

**Goals and progress**

The first condition for having flow at work is the ability to set one’s goals – not necessarily the long-range goals, but the moment-by-moment goals that need to be met as the task proceeds in order to achieve the overall goal of the enterprise. In every activity we have studied, the flow experienced by the actor is contingent not on the overall goal but on the enjoyment experienced from overcoming the obstacles presented by the task along the way. The main enjoyment of a musician does not come from reaching the end of the song he is playing, but by playing each note and each chord as well as he can. The main enjoyment of a rock climber usually comes from each move, each small progress she makes on the rock, not from reaching the end of the climb. Similarly, to improve the quality of the work experience what matters most is not the ultimate goal of the task but how we can organize the ways needed to reach it.

In any job, there are several variables that can be modified so as to define more clearly how the task ought to be done. The first, of course, is what product or service the worker is expected to provide. This decision in a contemporary work setting run along traditional lines is likely to remain a top-down decision dictated by management and unions, and not directly by the worker himself. However, the details of how the task is to be accomplished leave an enormous latitude to the worker. And, as the architect Mies van der Rohe used to say, “God is in the details.”

In the first place, as far as the worker is concerned, the goal might be very different from what the job description stipulates. As Wrzesniewski and Dutton (2001) have shown, one cleaning woman at a hospital might describe her task as keeping the patient’s bed and bathroom clean, while another hired to do the same job describes it as making the patient happy and comfortable in her hospital room. Not surprisingly, the second woman is likely to find her job more challenging and rewarding – even though she essentially goes through the same motions as the first one.

Middle-level managers often report that what they like least about their job is having to turn in weekly written reports to their superiors, which are time-consuming to write, boring to read, and rarely noticed or commented upon by the boss. It does not take too much effort, however, to make these managers see that if they redefine their task as that of writing a little essay that concisely but accurately describes what their team has accomplished, and turn the routine report into an elegant personal
statement, then the dread task becomes a win-win proposition: the writer will enjoy it more, and so will the reader. Perhaps the report will even lead to some actionable improvement in the workflow of the organization.

In traditional organizational contexts goals were usually handed down from an authority figure or supervisory position. Tasks were clear and goals were clearly defined every step of the way. Progress against some sort of externally imposed quota was the primary concern for both management and the employee. However, as autonomy increases across many work modalities this highly directed and regimented approach to goals and progress is shifting to the purview of the individual worker or self-managed team. How are decisions about goals made when an increase in autonomy means there is no longer a boss or supervisor dictating specific goals for employees to execute?

Self-leadership, the process by which individuals control their own behavior through behavioral and cognitive strategies, may become a much more prominent factor in the highly autonomous work of the future (Manz, 1986). Self-leadership is generally broken into three types: behavior-focused strategies, natural reward strategies, and cognitive thought pattern strategies. These strategies all revolve around the conscious decisions individuals make about how to structure and interact with their work and environment in order to achieve their goals. In a work environment where autonomy is very prevalent the successful utilization of self-leadership strategies becomes even more important. Breevaart, Bakker, and Demerouti (2014) found support for this concept with a study that showed maternity nurses who used daily self-leadership behaviors had greater work engagement via the mechanism of greater resourcefulness of the daily work environment (i.e., more skill variety, feedback, and developmental opportunities).

Individuals need to be able to set their own goals and gauge their progress without the guiding hand of an external supervisor. Knowledge of flow and the conditions that lead to it becomes a powerful piece of knowledge for the independent worker trying to figure out how to best work with little supervision and a seemingly endless array of possibilities in terms of strategies and behavior. Flow is found as goals are set so as to provide a sense of progress while working in a highly autonomous environment.

For example, the solopreneur who can break a nebulous goal, like “Start a profitable company,” into concrete and ultimately doable goals is likely to find more flow than the individual who has not clearly defined any specific goals. This goal setting and progress checking must be an individually motivated activity in a work environment where supervision is limited. Without it the pervading feeling of workers in the future, regardless of specific industry, is likely to be one of dull frustration as they encounter amorphous goal after amorphous goal.

Feedback

Another primary component of finding flow is timely feedback. Immediate feedback allows the individual to make slight alterations to behavior that guide progress. For the flow-engaged rock climber that feedback is simply the fact they are still
clinging to the rock face and making progress toward the summit. For the pianist, the feedback of hearing a wrong note allows changes to be made and skills developed. For the highly supervised worker, this feedback may come in the form of praise or criticism from an ever-vigilant boss, customers, or coworkers. True, in the world of highly autonomous work, external feedback is often lacking.

In many cases, the sources of feedback are highly dependent on the type of work. In manufacturing and other industries where physical products are manipulated and created, feedback can be generated visually or through quality control processes. Highly skilled workers may be able to create feedback for themselves by simply observing the final product. In a modern manufacturing facility the assembly line approach may divorce the individual worker from any sense of actionable feedback because the result of their work is not clearly observable and the overall task identity is nonexistent. For this reason many manufacturing facilities have shifted production from a pure division of labor model to self-managed teams that are involved in production from the beginning to the end. Teams of this nature can receive the feedback of observing and testing the final product, which provides valuable information for future work, or from the other team members (e.g., Bakker, 2005; Walker, 2010).

It is clear how making things can provide tangible sources of feedback, but what about the realm of knowledge work? Knowledge workers rarely produce physical products and can spend the entirety of their workday sitting in front of computers. In this context, feedback needs to be generated by the individual. The ultimate source of feedback is that which is generated by the expert who is competent to judge what it takes to do his job well. A master worker knows when he or she is creating excellent or mediocre work. In a highly autonomous work environment, this master worker has the freedom to monitor his or her physical and mental energy. Knowing when work is beginning to suffer and taking the proper course of action to rectify the slip in quality, whether taking a power nap or moving to a less taxing activity, are the mark of a master worker. Master workers are able to find flow in their work because they can find real-time, meaningful feedback on their own progress. When the feedback begins to show a decline in quality, autonomous workers can decide how to best use their time and attention to be productive. Feedback is no longer the purview of the higher levels of the organizational hierarchy, but an intra-individual process for making decisions about how to work.

**Balancing challenge and skill**

In order to find flow one must find the balance between the perceived opportunities for action – or challenge – an activity offers and the skills related to that activity one has at one’s disposal. Autonomy in work provides a great amount of leeway for making adjustments to bring these two characteristics into alignment. Whereas low-autonomy work situations often result in individuals having much greater skill than needed for a particular situation, thus resulting in boredom, high autonomy allows individuals to tweak the amount of perceived challenge and ideally find flow in a larger proportion of their work.
Finding the flow “channel” and staying in it for as long as possible has the added bonus of allowing the individual to improve his or her skill in a certain domain. As workers improve their skills, they must find greater challenges in order to continue experiencing flow. Many nonautonomous work situations do not give individuals an opportunity to increase the challenge of their work once they have acquired the necessary amount of skill to no longer make it a flow activity. On the other hand, a highly autonomous job, whether working for an organization or as an independent professional, may allow the individual to seek out and engage with higher-challenge situations as they develop their skills.

For example, a new digital design freelancer may find the process of completing simple logo creation assignments a very challenging endeavor. The process of finding a small client, such as a local retail store, developing a logo, incorporating feedback, and eventually delivering a final product may be incredibly flow-inducing. However, as the freelancer gains skill in each of these areas he may feel compelled to find more challenging assignments and larger clients in the future. By noticing when he is and is not experiencing flow in his current work, he can make better decisions about how to grow his business and engage in more challenging, and ultimately more rewarding, work.

To remain in flow, a person should not be distracted by stimulation that is irrelevant to the task at hand. Some people can concentrate better when they work alone in a quiet and neutral space, while others are more efficient in focusing when there are people moving around and there is background noise. A one-size-fits-all workplace is certainly easier to set up and probably cheaper, but is likely to waste a great deal of the attention of the workers – which after all, is the most important asset the organization possesses – distracting them with boredom induced by solitude, or with anxiety due to unexpected social intrusions. The same applies to the surroundings: some persons can concentrate better in minimalist spaces without any visual distraction; others can focus better amid the clutter of personal objects and images.

Applying the perspective of flow theory to the workplace of the future suggests one basic conclusion: in order to achieve the best results, we should create productive organizations that can make the best use of the psychic energy of its members, while at the same time endeavoring to make the process of work as enjoyable, meaningful, and engaging as possible. If the worker experiences flow at work, he or she will focus mental energy on the task – thus achieving organizational goals – and at the same time feel that the energy is well spent because it is fun.

Measurement and the future of flow at work

While organizations have an important role in the support and development of flow among employees, individuals also have the opportunity to take on greater responsibility in making their work a more enjoyable expression of their strengths and values. As autonomy continues to increase in the organizational setting, employees can take an increasing role in their day-to-day experience of work. The problem
is very often workers might feel a general sense of dissatisfaction with their job, without knowing what it is that they feel. We seldom have an objective sense of our inner lives – of what it is that bothers us, and why. Yet if we want to achieve flow at work, it is necessary to have reasonably accurate information about how the activities, the people, and the tasks that make up our job affect us. Only then can we begin to change the parameters of the job, and find out, by trial and error, what might make it better.

One way this could be done in the near future – short of difficult and time-consuming training in systematic introspection – could be achieved through the application of “wearable technology.” Wearable technology refers to the growing class of technological gadgets embedded within everyday objects or adorning our bodies. They are full of sensors that passively monitor and record various aspects of our physiology and environment. Over the next several years, wearable technology is likely to be one of the largest areas of innovation in consumer electronics. We are already seeing the vanguard of this movement with products like Google Glass, a computer/glasses hybrid. Smart watches are being developed (e.g., the Apple Watch) which allow individuals to have access to various forms of data easily accessible on their wrist instead of on a phone in their pocket; or in the case of Hitachi, on electronic chips worn on a necklace. Even smartphones are entering the realm of wearable technology with their ability to track movement. Smartphone app developers and accessory creators have released heart rate monitors, GPS-based running assistants, and a multitude of other gadgets that can monitor changes in the body and present the user with that information.

The measurement of flow has always had a relationship with technology as early ESM studies utilized programmable beepers at a time when that was highly unusual in psychological research (see Csikszentmihalyi & LeFevre, 1989). Then study participants had to be given the beeper and trained in its use in order to record their data. Now, the vast majority of potential participants in flow studies, especially in the realm of white-collar knowledge work, already carry a smartphone of their own. The use of mobile apps like PACO to facilitate data collection has made ESM studies easier and cheaper to initiate.

However, the even greater potential lies in the ability of individual users to track their own experience over time with their own smartphones or other wearable tech. There is no reason an app could not be created today that makes it easy for individuals to set up an ESM-like self-study that would allow them to track how often and under what conditions they experience flow. In this scenario, the app facilitates their ability to track and manage their own experience of flow at work. The combination of the knowledge of what flow is, why it’s beneficial, actual data on when the individual does and does not experience flow, and the latitude to make changes in aspects of his or her work environment could unlock the potential for individuals to experience more flow at work.

Looking into the future a little bit further could unlock an even easier way for individuals to track flow throughout the day. Traditional ESM studies have always
Will work ever be fun again?

struggled with the fact that they require the participant to shift attention from whatever they were doing in the moment to the survey they are being prompted to respond to about what they are doing in that moment. Ironically, the measurement of flow can actually disrupt the experience itself. Wearable technology that monitors the body for biological markers can help work around this challenge. Imagine that a worker puts on his technology-infused glasses that measure his brain waves and a technology-infused shirt that monitors his skin conductance, heart rate, and several other biological markers as he gets ready for work in the morning. He goes through the day experiencing varying levels of stress, affect, flow, and boredom while wearable technology sits silently in the background, recording data. At the end of the day he opens the flow app on his smartphone (which is able to communicate with a calendar that records what he was doing and who he was with at specific points of the day) and is presented with an easy-to-understand visualization of his flow levels throughout the day. He learns that he experienced a high level of flow during the morning drive into the office (except when he was cut off a few miles away and silently fumed for the rest of the trip). The meeting which he prepared for very well turned out to be another high-flow activity during the day, whereas the emergency meeting later in the day in which he felt unprepared was another low point. With an understanding of what flow is and what factors affect whether he experiences it, his wearable technology and smartphone application offer a nearly limitless way to tweak experience at work to be more flow-like.

Conclusion

The last several pages have explored what the future may look like. Our predictions are based on sound evidence, but predicting the future is a difficult endeavor for anybody, particularly empirically minded scientists. If our predictions about the future of work are correct—that autonomy will continue to grow in importance and the new class of “independent workers” will move more and more into the spotlight—then it stands to reason that flow will continue to have an important role in designing and crafting work to be more meaningful and fulfilling.

The world of work holds the potential to be a great source of well-being in the lives of individuals, or a great source of sorrow, drudgery, and exploitation. The experience of work itself has evolved and gone through cycles that have mapped onto the social evolution of the human species. Our hope is that work can move once again toward an intrinsically rewarding and motivating source of self-expression for an increasing number of people. Learning about the antecedents to flow, self-monitoring our personal data with the astonishing advances in wearable technology, and then crafting our jobs based on that information are a series of steps in the direction of experiencing work as a positive force in life. Indeed, in the future we might perhaps turn Dante’s insight into reality, and work will once again provide the ultimate enjoyment that comes from expressing our images, and unfolding our beings.
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