Chapter 7: Applications of Flow to Work

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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"). Csikzentmihalyi 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 91 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 et al., 2014), and school teachers (Salanova, Bakker, & Llorens, 2006). They identified important antecedents of flow at work, including individual difference components (e.g., Eisenberger et al., 2005), work environment characteristics (e.g., Mäkikangas et al. 2010), and the additive or interactive effects of the two (e.g., Bakker, 2005; Moneta, 2012a; Salanova, Bakker, & Llorens, 2006). Scholars also identified important consequences of flow at work, including enhanced employee's 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 in 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, i.e., as a state of being deeply immersed in an activity. On the other extreme, Jackson and Csikszenmihalyi (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, 2012b) 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 intervention: only one based on Schiefele and Raabe's (2011) definition of flow, up to nine based on Jackson and Csikszenmihalyi'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, i.e., experiences that can be caused by flow, whereas the remaining are *antecedents* of flow, i.e., 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 Csikszenmihalyi'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, 2012b). 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, & Prescott, 1977; Csikszentmihalyi & Larson, 1987) 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, Abuham-deh, & Nakamura, 2005; Delle Fave & Massimini, 2005; Ellis, Voelkl, & Morris, 1994; Fong, Zaleski, & Leach, 2015; Inkinen et al., 2014; Rheinberg et al., 2007). Therefore, the perception of challenges and skills when engaged in work tasks appear 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, 2012, 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 betweeen 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 professsional 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.
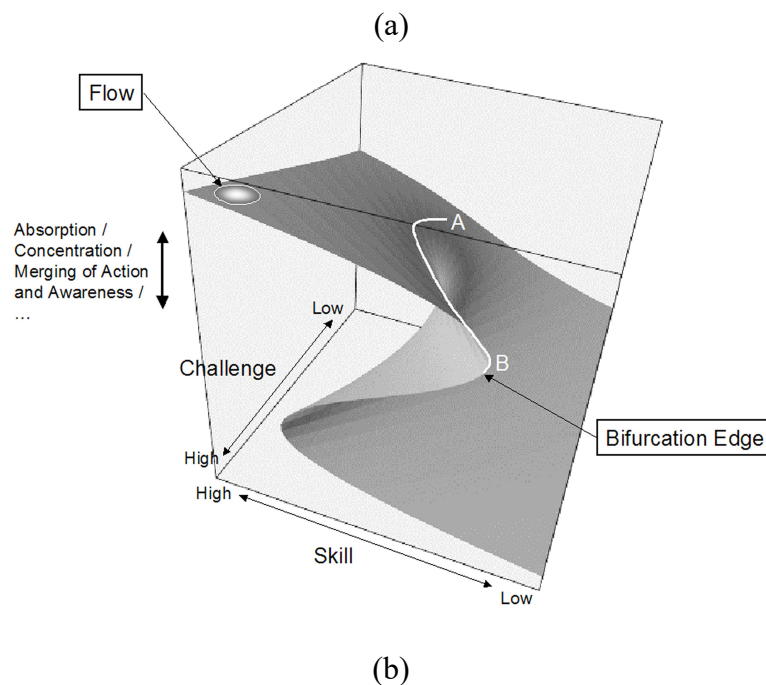
Can organizations intervene on, and "tune" their employees' levels of perceived challenges and skills in an average workday? In principle, it seems possible to induce a reduction or augmentation of an employee's level of perceived challenges by changing the level of difficulty of the work task or assigning 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 1. Figure 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 enhancement of

subjective experience or a sharp deterioration of subjective experience, and the probability of

either outcome is about fifty percent. 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

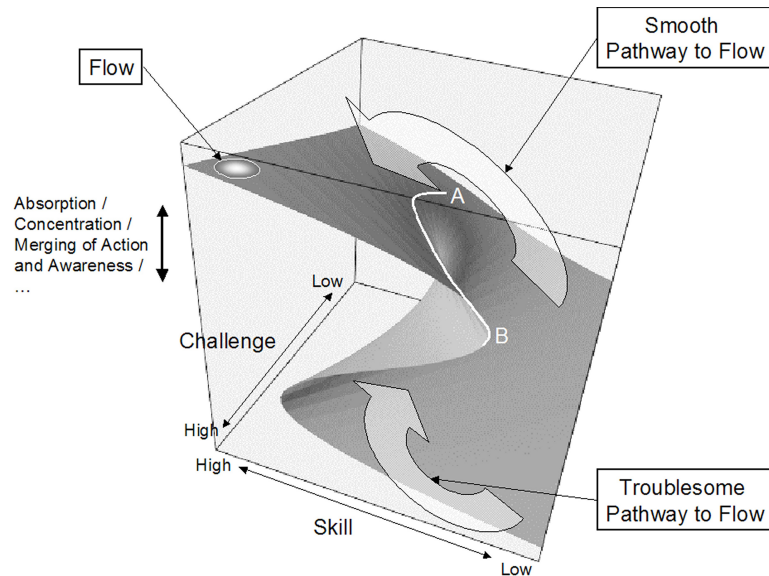the greatest variability of outcomes.

(a)

(b)

Figure 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)

How does the nonlinearity of flow influence the way a worker can enter flow at work? Figure 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 till 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 patway begins with high challenges and low skills, proceeds by just increasing skills till 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.

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 employee's 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 and co-workers (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 "non-flow". 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 states that they never had such experiences. For example, 32.7 per cent 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 2 of 3 workers experience flow, how many of them do experience it at work? Moneta (2012a) 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. More than 58 per cent of flow-ers resulted having 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 – in the weekends and holydays. Therefore, the answer to the second sticky question is that there is a sizable 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 et al., 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 (McClelland, 1985). Two studies unveiled the powerful influence achievement motivation has on the occurrence flow and its consequences to performance. Eisenberger and co-workers (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 (2012a) 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 per cent). 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 team members. This raises the issue of whether flow, which was originally defined within an individualistic phenomenology that depicts the individual 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 and co-workers (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 helping directly 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) – indicate 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., Fullagar & Kelloway, 2009; Engeser & Baunmann, 2016); 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 and co-workers (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 non-hierarchical, *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 and co-workers (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 and co-workers (2014) replicated Walker's (2010) finding using two-wave data gathered in experimental conditions involving a simulated work task, and found, in adddition, 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 meting room. They can also introduce formal programs that allow for the spontaneous creation of distributed teams. For example, Google allows his engineers to devote up to 20 per cent 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 startup companies. Startup 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 environments. 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' (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 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 of how to alternate flow and rest in they 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 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 & Matthews, 1994; Wells, 2009) 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 then trying to foster flow by means of external influence. The development and initial application of the Flow Metacognitions Questionnaire (FMQ; Wilson & Moneta, 2016) indicates 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 in 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 results 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 operalization 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 at 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., Guptil, 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 non-flow 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 employee's 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.

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