Overly Immersed: Understanding the Two Sides of Flow and their Implications for

Mediated Work Environments

Authors

Giang V. Pham, University of Illinois at Urbana-Champaign

Abstract

"Flow" states- which people experience when fully focusing on an activity- are believed to be the key to peak performance and enjoyment at work. However, the positives of flow may have a potential downside- it could facilitate one activity at the cost of others by diverting people's time and mental resources away from these tasks. The shift to remote work due to Covid-19 has given people more responsibility in terms of holding themselves accountable than what they have in the interpersonal environment. With work being fully mediated, the ability to keep up with- and switch between- tasks has become crucial, and an over engagement due to flow in one task could easily impede this ability and hinder performance. The current paper thus advocates the importance of recognizing flow as a source of both positive and negative outcomes. It aims to identify potential contextual factors that determine when flow in a mediated environment could be beneficial vs. harmful for productivity, thereby providing implications for a systematic detection and intervention of "disruptive" flow experiences in such environments.

Keywords: mediated work; flow; flow diversion; productivity; goal performance

Introduction

In light of the Covid-19, a large portion of the workforce has had to switch to working from home, and will likely continue to do so even after the pandemic has passed (Levy, 2020). Working remotely requires workers to rely on digital devices and technologies such as remote desktops, cloud technologies, collaborative tools (e.g., Sharepoint, Microsoft Teams) to carry out their tasks. While this shift provides people the convenience of performing every task in one virtual space and not having to physically move between places, it also takes away the accountability from being surrounded by other people and physical movements. For example, in the traditional interpersonal environment, people oftentimes have their coworkers close by to discuss or to remind them of the tasks they need to complete. They could also see others leaving for a meeting, which could remind them to stop what they are doing to get to their meeting in time. Because these external cues play an important role in keeping workers on track with their responsibilities, it is important to understand how the lack of such cues in the mediated work environment could affect people's work performance.

Research has shown that people perform best and enjoy their work the most when they are in "flow" - a psychological state characterized by intense focus, loss of self-consciousness, and temporal distortion (Csikszentmihalyi, 1975). When in flow, people fully immerse themselves in what they are doing and instead of being constantly interrupted by external things like emails, instant messages, and even internal thoughts about their personal life, they are able to focus on the task long and deep enough to accomplish a peak performance. For that reason, flow has been posited to be the driver of productivity (see reviews by Csikszentmihalyi, 2000). However, despite the ability to facilitate the performance of the flow-inducing activity, flow

encompasses characteristics that can be problematic to the performance of tasks outside of that activity. Particularly, the full absorption of cognitive resources during flow could divert people from the awareness of other tasks they want or need to do. For example, a person planned to accomplish three tasks within three hours: programming, responding to email, and writing a report. However, when the person experiences flow in programming, he becomes overly immersed in it and forgets about the notion of time as well as his other obligations. As a consequence, he might have to spend less time on other tasks or even delay them.

Given the lack of external cues in mediated work environments, the over engagement with an activity due to flow could potentially be even more of a concerning issue for workers, because now it's entirely up to them to transition between tasks at work. In addition, the easy switch between work and entertainment (e.g., using social media, reading/watching news, etc.) on digital devices while working remotely could make the lure of becoming overly engaged and spending too much time on entertainment activities even harder to inhibit. Thus, the present paper calls for attention to the potential downsides of flow for productivity. We propose goal pursuit context (i.e., the number of tasks to be completed) as a potential determinant of flow's outcomes- whether it will be beneficial vs. harmful for workers who experience it. This line of research promises to extend the theoretical knowledge of productivity by demonstrating flow as a source of both positive and negative outcomes in regard to productivity. It will also advance flow research by demonstrating how the context in which flow occurs affects people's work performance, thus providing implications for building a computer supported system that takes into account the roles of contextual factors in handling work engagement and helps improve the amount of desirable while decreasing the amount of undesirable flow experiences at work.

Relevant Body of Work

Flow is defined as a state of intense, effortless concentration on the present activity (Csikszentmihalyi, 1975). It is considered an optimal experience, in which people seem to be cut off from the outside world and they are doing something purely ''for its own sake, with little concern for what they will get out of it" (Csikszentmihalyi, 1990, p. 71). Researchers have identified the characteristics of flow including a merging of action and awareness, a sense of control, a loss of self-reflective consciousness, a distortion of temporal experience, and an experience of the activity as intrinsically rewarding (e.g., Finneran & Zhang, 2005). When in flow, people act without the awareness of their every movement (e.g., clicking on the mouse without being aware of it), have a complete sense of control (e.g., knowing what happens next when they make a command), set aside their personal concerns, abandon the notion of time, and above all, truly enjoy the experience. The physiological measures taken during flow indicate a specific psychological state characterized by high arousal, high positive valence, steady mental effort, high pleasure and reward (Bian et al., 2016; Mauri et al., 2011; Salimpoor et al., 2011).

The balance between challenge and skill in an activity is the condition necessary to the production of flow (Csikszentmihalyi, 1975). If challenge exceeds skill (e.g., the activity is too difficult), people will feel overwhelmed and anxious. On the other hand, if skill surpasses challenge (e.g., the activity is too easy), people will quickly get bored. In either case, people will not feel as motivated and satisfied in the process of the activity as they do when experiencing flow; hence, flow has been considered the optimal state of enjoyment and motivation (Csikszentmihalyi, 2000). Flow has been found a universal experience that can occur in every domain of daily life such as work, sports, creativity, and even entertainment such as watching

movies and browsing social media (e.g., Finneran & Zhang, 2005; Mauri et al., 2011), etc. When occurring at work, flow is believed to not only help people excel at what they are doing, but also enjoy what they do the most (Martin, 2005). For these reasons, achieving flow while working has been highly valued, and there has been a lot of effort into understanding what could facilitate flow experiences for workers (e.g., Souders, 2020).

However, most research on flow has assumed that the flow-inducing activity is either the only or ultimate goal that people have. Specifically, researchers have only focused on the positives of flow within a single task without examining how it would fit into the larger context of daily life where people often have a series of tasks and goals they need to complete. When people have several tasks to be done, the ability to efficiently switch between tasks is crucial to their performance, and an over engagement in one task would potentially cost them the time and effort that they should devote to other obligations, affecting the quantity and quality of tasks that they can complete. For that reason, it is important to begin examining how flow could lead to diversion effects on productivity when people have multiple goals and obligations.

A critical condition of successful goal performance is that people remember their goal intention including what to do and when to do it, so that they can start acting on their goal (Locke & Latham, 1990). In order to do so, they need to be able to retrieve information regarding their goal intention that has been previously stored in the cognitive systems (Einstein & McDaniel, 1996). For example, in order to create a slidedeck, one has to successfully retrieve information regarding the task intention (e.g., what to create, when to start creating, etc.). Nowadays, workers also rely on means other than their own memory such as smartphone or laptop reminders to manage their activities (e.g., Stawarz, Cox, & Blandford, 2014). These

reminders serve as external cues that remind people of their goal intentions. Even checking the time could be essential as it informs people of the temporal markers of their task. However, for these cues to be effective, people need to have the capacity to attend to these external cues and recognize them at the moment.

A plethora of research has shown that humans have a limited pool of attentional and cognitive resources at any given time (e.g., Lang, 2000). When a person performs an activity, a part of their resource pool will be devoted to this activity. Depending on the nature of the activity, there could be few resources available in their pool to perform other activities simultaneously. Because the defining feature of flow is a full immersion in the activity and it requires a match between challenge and skill (Csikszentmihalyi, 1975, 2000), when people are in flow, their cognitive resources should be strictly and entirely allocated to the activity. People might not yet reach the cap of their limited resource pool (as they are still able to carry on the activity), but they should narrowly focus their attention on the concurrent activity. If the current activity is people's only goal pursuit, flow provides them the opportunity to become engrossed in the activity and advance their performance, as previous research has demonstrated. However, if people have other ongoing goals or obligations, the full devotion of cognitive resources to the flow-inducing activity could prevent them from directing resources to retrieving or recognizing information regarding their subsequent goal(s).

The distortion of temporal perception, a crucial component of flow, also results from the full absorption of attentional and cognitive resources during flow. Because the capacity for experiencing time is decreased by the requirement of resources for generating flow, people no longer have the conscious awareness of time passing by and later recall an much shorter duration

of time spent on the activity (Rau et al., 2006). This underestimation of time could make people unconsciously extend their stay on the flow-inducing activity and delay the subsequent activity because they don't truly comprehend how long they have spent in the task.

Taken together, it is posited that flow can negatively impact work performance when people have several goals they need to accomplish, because: (1) it takes up the cognitive resources needed for people to retrieve and/or recognize information regarding their subsequent goal intention(s), (2) it distorts their time perception, which could lead to an unintentional overstay on the flow-inducing task and delay of the subsequent task(s), and (3) it leaves people with fewer resources to perform subsequent tasks that could be equally or more important than the flow-inducing activity. Given that people have a limited capacity of cognitive resources and a limited total of 24 hours for their daily activities, the more time and cognitive resources they devote to the flow-inducing activity, the less time and resources they would have for subsequent activities. Besides, because the experience of flow is intrinsically rewarding, it could not only make people spend more time on the task than intended but could also make them reluctant to switch to another task, imposing subtle emotional costs.

For example, a worker could originally plan to work on a slide deck for one hour then respond to emails, but while working on the slide deck, they experience the flow state and become too focused that they can't recognize they need to start working on emails even after one hour has passed. Due to this, the worker might end up having to spend less time than intended on emails, which could result in an unsatisfactory performance, or having to take time from other activities (e.g., making a report) to make up for their time lost in flow. While having enjoyed working on the slidedeck, the worker feels unsatisfied afterwards because of failing to comply

with their original schedule and having to take time off their other activities.As such, flow has

facilitated one task (creating the slide deck) but disrupted other tasks (writing emails and/or

making a report) for the worker.

With all work now being carried out virtually, people naturally have to spend more time

in the mediated environment than they usually do. Even though most productivity tools provide

notification functions for a better management of tasks, due to a number of reasons (the

notifications are turned off or easily ignored), they could be not as effective as external cues that

the interpersonal work environment provides. Thus, workers have to rely significantly on

themselves to keep up with their work obligations. At the same time, entertainment media

consumption has seen a massive increase in the age of Covid-19 (Jones, 2020). The need for

Covid-19 updates and pandemic positivity has motivated people to consuming media (e.g.,

reading news, watching online videos, using social media) a higher amount than usual, possibly

without realizing that they could experience flow and become more immersed in media

consumption more than they planned to. When people experience flow in entertainment activities

while working remotely, the amount of time and cognitive resources for work obligations would

be even more hampered than when they experience flow in one of their work tasks. As such, a

computer supported system that could detect people's over engagement with an activity and

determine whether that over engagement would lead to potential conflicts in work performance

would be really helpful for those working in mediated environments.

Current Implications

The examination of flow as a double edged sword for productivity will extend the

knowledge of the predictors of productivity by demonstrating the potential moderation role of

contextual factors (e.g., the number of tasks and goals) in the relationship between flow and productivity. It also brings up a notion about the potential tradeoff between work quality vs. quantity due to flow- while flow could benefit the quality of work in one task, it could harm the quantity and potentially the quality of tasks to be accomplished within a period of time. Thus, it is recommended that workers, especially those who work remotely, make a conscious effort to create the conditions for experiencing flow for tasks they want to immerse themselves in and achieve a high performance, but avoid the conditions for experiencing flow for tasks that they know would impede their performance on other tasks. This could be done by planning tasks in a way that flow-inducing activities would not immediately conflict with other activities (e.g., setting time to work on something that requires an intense focus or could easily become engaging on days when there are no scheduled meetings or deadlines).

This research also provides practical implications for planning and scheduling programs to improve their ability in assisting workers with their work management. Particularly, such programs could take into account the knowledge of the relationship between flow and productivity to build suggestions, alerts, and even interventions that help people maximize the positives of flow while minimizing the negatives of it. For example, tracking the amount of time people typically spend on each type of activity and using that information to inform the planning of tasks so that flow-inducing activities will be placed on days with minimal conflicts will help remote workers take the most advantages of flow experiences during work. Among similar lines, detecting when people are getting too engaged with a task while having upcoming obligations and sending them alerts to help them prepare for a task-switching would help them stay on track with their responsibilities and ensure their productivity.

Conclusion

Overall, the current research represents an effort toward extending the theoretical understanding of flow and its impact on productivity, as well as the practical implications for work performance. Given the shift to remote work due to the pandemic, understanding flow as a factor that can both facilitate and impede work performance will certainly be useful for developing technologies that assist workers to hold themselves accountable and effectively plan and carry out their work in mediated environments.

References

Bian, Y., Yang, C., Gao, F., Li, H., Zhou, S., Li, H., Sun, X., & Meng, X. (2016). A framework for physiological indicators of flow in VR games: construction and preliminary evaluation. *Personal and Ubiquitous Computing*, *20*(5), 821-832.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco, CA: Jossey‑ Bass.

Czikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. Pennsylvania, NY: Harper & Row.

Csikszentmihalyi, M. (2000). The contribution of flow to positive psychology. In J. E. Gillham (Ed.), *Laws of life symposia series. The science of optimism and hope: Research essays in honor of Martin E. P. Seligman* (pp. 387-395). West Conshohocken, PA: Templeton Foundation Press.

Finneran, C. M., & Zhang, P. (2005). Flow in computer-mediated environments: promises and challenges. *Communications of the Association for Information Systems*, *15*(1), 4.

Jones, K. (2020, April 7). *How COVID-19 Has Impacted Media Consumption, by Generation*. Retrieve from https://www.visualcapitalist.com/media-consumption-covid-19/

Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication*, *50*(1), 46-70.

Levy, A. (2020, May 11), *Working from home is here to stay, even when the economy reopens*. Retrieve from https://www.cnbc.com/2020/05/11/work-from-home-is-here-to-stay-after-coronavirus.html

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice–Hall.

Martin, A. J. (2005). The role of positive psychology in enhancing satisfaction, motivation, and productivity in the workplace. *Journal of Organizational Behavior Management*, *24*(1-2), 113-133.

Mauri, M., Cipresso, P., Balgera, A., Villamira, M., & Riva, G. (2011). Why is Facebook so successful? Psychophysiological measures describe a core flow state while using Facebook. *Cyberpsychology, Behavior, and Social Networking*, *14*(12), 723-731.

Novak, T. P., Hoffman, D. L., & Yung, Y. F. (2000). Measuring the customer experience in online environments: A structural modeling approach. *Marketing Science*, *19*(1), 22-42.

Rau, P. L. P., Peng, S. Y., & Yang, C. C. (2006). Time distortion for expert and novice online game players. *CyberPsychology & Behavior*, *9*(4), 396-403.

Salimpoor, V. N., Benovoy, M., Larcher, K., Dagher, A., & Zatorre, R. J. (2011). Anatomically distinct dopamine release during anticipation and experience of peak emotion to music. *Nature neuroscience*, *14*(2), 257.

Souders, B. (2020, Jan 17). *Flow at Work: The Science of Engagement and Optimal Performance*. Retrieve from https://positivepsychology.com/flow-at-work/