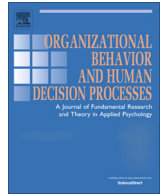




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“Switching On” creativity: Task switching can increase creativity by reducing cognitive fixation



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ABSTRACT

Whereas past research has focused on the downsides of task switching, the present research uncovers a potential upside: increased creativity. In two experiments, we show that task switching can enhance two principal forms of creativity—divergent thinking (Study 1) and convergent thinking (Study 2)—in part because temporarily setting a task aside reduces cognitive fixation. Participants who continually alternated back and forth between two creativity tasks outperformed both participants who switched between the tasks at their discretion and participants who attempted one task for the first half of the allotted time before switching to the other task for the second half. Importantly, Studies 3a–3d reveal that people overwhelmingly fail to adopt a continual-switch approach when incentivized to choose a task switching strategy that would maximize their creative performance. These findings provide insights into how individuals can “switch on” creativity when navigating multiple creative tasks.

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1. Introduction

In a world of hustle and bustle, switching back and forth between tasks—“task switching”—has become the work style of countless individuals (e.g., [Hallowell, 2005](#); [Perlow, 1999](#)). Bombarded with emails, phone calls, and meetings, managers and employees alike constantly shift their attention from one task to another ([Rosen, 2008](#)). Task switching is especially common among senior executives due to their numerous responsibilities ([Bandiera, Prat, Sadun, & Wulf, 2014](#); [Dean & Webb, 2011](#); [Ocasio, 1997](#)). In fact, the propensity to task switch emerges as early as adolescence: the average 7th–12th grader estimates spending 60% of the time they set aside for homework switching between homework and other activities (e.g., email, instant messaging; [Foehr, 2006](#)).

Not surprisingly, the increasing prevalence of task switching has prompted substantial research on its psychological consequences. For instance, past research has revealed that task switching increases susceptibility to distraction ([Leroy, 2009](#); [Ophir, Nass, & Wagner, 2009](#)), facilitates error-making ([Monsell, 2003](#)), slows execution ([Rogers & Monsell, 1995](#)), diminishes learning ([Hembrooke & Gay, 2003](#)), induces forgetting ([Einstein, McDaniel,](#)

[Williford, Pagan, & Dismukes, 2003](#); [Finstad, Bink, McDaniel, & Einstein, 2006](#)), lowers writing quality ([Foroughi, Werner, Nelson, & Boehm-Davis, 2014](#)), and heightens social anxiety ([Becker, Alzahabi, & Hopwood, 2013](#)).

While these studies clearly show the *negative* consequences of task switching, they leave open the question of whether there are any *benefits* of adopting a task-switching approach to one’s work. Using both divergent and convergent thinking measures of creativity, the present research demonstrates that continually switching between tasks can enhance *creative* performance by reducing cognitive fixation. Importantly, we also provide evidence that people undervalue the benefits of continually switching between creative tasks: when incentivized to maximize their performance on multiple creative tasks, people overwhelmingly fail to select the most effective work approach (i.e., continual task switching), suggesting that creative performance may improve if people are encouraged to switch between tasks at a greater frequency.

The present work contributes to research on workplace creativity in several important ways. First, it is among the first to empirically demonstrate an upside of task switching, while past research has almost exclusively focused on its downsides. As a result, the current findings offer a more balanced way of conceptualizing the effects of task switching. Second, although many modern employees increasingly switch among *multiple* tasks ([Rosen, 2008](#)) and although creativity is increasingly valuable to organizations ([IBM, 2010](#)), the scholarly literature is nearly silent about whether and how a task-switching approach shapes people’s

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creative work. To fill this gap in knowledge, we explore the implications of this workplace trend for creative performance. Third, we provide mechanistic evidence for why task switching may enhance creativity by introducing a novel metric of cognitive fixation, which past research has struggled to directly measure (e.g., Durso, Rea, & Dayton, 1994). Finally, we reveal that people erroneously expect that continually switching between tasks is less conducive to creative performance than alternative approaches (e.g., performing tasks in a serial fashion). This implies that individuals and organizations stand to profit from recognizing the creative benefits of task switching and adjusting the way they structure creative tasks at work.

1.1. Creativity at work

Creativity, typically defined as the production of ideas that are both novel and useful (Amabile, 1983), is critical to individual and organizational success (for reviews, see Hennessey & Amabile, 2010; Shalley & Gilson, 2004; Shalley, Zhou, & Oldham, 2004; Zhou & Hoever, 2014). According to a survey of over 1500 CEOs across 60 nations and 33 industries, creativity was identified as the most important leadership quality (IBM, 2010). Creative employees conceive ideas, products, services, procedures, and processes (Woodman, Sawyer, & Griffin, 1993) that can culminate in innovations that benefit the organization. From an interpersonal perspective, creative employees can inspire “outside-the-box thinking” among their colleagues to build an inventive environment within the organization (Shalley & Gilson, 2004). From an organizational perspective, creativity empowers the organization to survive and thrive in a dynamic world of unforeseen challenges and opportunities (Nonaka, 1991).

Although it is clear that creativity can influence critical organizational outcomes, many practitioners struggle to design work routines that foster creativity at work. For example, in a survey conducted with senior executives, over 70% championed workplace innovation as a vital driver of organizational success, yet 65% expressed a lack of confidence in their ability to promote it (Barsh, Capozzi, & Davidson, 2008).¹ In response to this knowledge gap, scholars have increasingly studied job design factors that enhance or hamper creativity. For example, studies have demonstrated that autonomous jobs make individuals more intrinsically motivated, which in turn enhances their creativity (Greenberg, 1992; Zhou, 1998). Other creativity-related job design factors include the spatial configuration of work settings (Shalley et al., 2004), job complexity (Hackman & Oldham, 1980), time pressure (Baer & Oldham, 2006; Byron, Khazanchi, & Nazarian, 2010), choice provision (Chua & Iyengar, 2006, 2008), and contingent rewards (Byron & Khazanchi, 2012).

One underexplored job design factor that may influence creativity is task switching. This oversight is puzzling not only because people often need to decide whether to adopt a switching versus serial approach to navigating multiple tasks, but also because there is a strong theoretical reason to suspect that switching between creative tasks increases the quality of output: by forcing individuals to temporarily put tasks aside, a continual-switch approach may elevate their creative performance by alleviating their tendency to cognitively “fixate” on ineffective ideas or problem-solving strategies (Chrysikou & Weisberg, 2005; Jansson & Smith, 1991; Purcell & Gero, 1996; Smith, 1995, 2003; Smith & Blankenship, 1991). In the sections that follow, we construct the theoretical case and test the hypothesis that performance on

creative tasks may improve when people continually switch between them because temporarily putting tasks aside reduces cognitive fixation.

1.2. Cognitive fixation impedes creativity

The notion that people commonly struggle to conceive creative solutions because they “fixate,” or fail to abandon inappropriate problem-solving angles, dates back to Luchins’s (1942) Einstellung (i.e., mental set) paradigm. In his seminal experiments, participants first attempted a series of problems whose solutions shared the same type of complex algorithm (i.e., the Einstellung algorithm). Strikingly, when participants later received a problem solvable with a much simpler algorithm, most of them “fixated” on the inefficient Einstellung algorithm and failed to utilize the simpler algorithm (see also Luchins & Luchins, 1959). Duncker (1945) advanced a similar explanation for poor problem-solving performance in his work on “functional fixedness,” or the inability to think beyond the conventional use of an object (i.e., to repurpose the object for a novel task setting). For example, Duncker (1945) demonstrated that when given a candle, a pack of matches, and a box of tacks, and challenged to affix the candle to the wall so that the candle burns properly and does not drip wax, a large percentage of individuals fixate on the tack box’s function as a repository for tacks and fail to realize that it can also be affixed to the wall and converted into a candleholder.

Building on these classic demonstrations, researchers have established cognitive fixation as a primary barrier to two principal forms of creativity: divergent thinking and convergent thinking (Smith & Blankenship, 1991; Smith, Ward, & Schumacher, 1993; Storm & Angello, 2010). Whereas divergent thinking involves the generation of *multiple* ideas in diverse directions (e.g., listing creative uses for a brick, Guilford, 1967), convergent thinking involves identifying the *unique* or *best* solution to a clearly defined problem (e.g., Duncker’s candle problem; Duncker, 1945). Both divergent and convergent thinking are considered critical yet distinct pathways to creativity, as identifying creative solutions often necessitates both diverging from previous approaches and converging on the optimal approach.

A wealth of evidence suggests that cognitive fixation impedes both divergent and convergent aspects of creativity. For instance, in the context of divergent thinking, individuals tend to generate fewer and less novel designs when the design instruction is accompanied by a pictorial example, because they are apt to generate ideas that conform to this example (Chrysikou & Weisberg, 2005; Jansson & Smith, 1991; Smith et al., 1993). Likewise, individuals generate fewer unique ideas when part of a brainstorming group compared to when brainstorming alone, because they fixate on the ideas proposed by other group members (Kohn & Smith, 2011).

In a similar vein, cognitive fixation is considered a barrier to solving problems that require convergent thinking. For instance, the classic convergent thinking task, the Remote Associates Test (RAT; Lu et al., 2017; Mednick, 1962), presents three cue words and asks the subject to conceive a fourth word that is associated with each of the three words (e.g., cue words: cheese, blood, print; solution: blue). The RAT can be challenging because people may first think of and fixate on a non-solution word that is strongly associated with just one of the cues (e.g., cheese—cake; blood—red; print—ink) instead of a word that is commonly associated with all three of them (Smith & Blankenship, 1991; Storm & Angello, 2010). Likewise, people commonly fail to solve insight problems because they fixate on unwarranted assumptions and strategies that interfere with the requisite insight (e.g., Duncker’s candle problem, Duncker, 1945).

¹ In the organizational behavior literature, innovation is typically defined as the successful implementation of creative ideas (e.g., Hennessey & Amabile, 2010), implying that creativity is the indispensable first stage of innovation (Zhou & Hoever, 2014).

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