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CHAPTER 8

# *Jumping About*
## *The Role of Mind-Wandering and Attentional Flexibility in Facilitating Creative Problem Solving*

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### Introduction

Creative cognition is thought to be rooted in executive functions, relying on both cognitive flexibility – quickly shifting between approaches, thoughts, and ideas – and cognitive persistence – systematically combining and recombining elements and possibilities to arrive at a novel solution (e.g., Nijstad et al., 2010). The creative benefit of flexibility becomes clearer when thinking about the ways in which creative idea generation may become blocked. For example, when people try to solve a creative problem, they can become stuck on old and inappropriate ideas – a phenomenon known as mental fixation (e.g., Smith & Blankenship, 1991). Taking a short break from the task (i.e., an incubation interval) can help overcome a mental impasse, which has been shown to both reinvigorate creative idea generation (for reviews, see Orlet, 2008; Ritter & Dijksterhuis, 2014; Sio & Ormerod, 2009) and to lead to a sudden insightful solution to difficult, ill-defined problems (Danek, 2018; Sternberg & Davidson, 1995). There have been several theories explaining how incubation intervals might facilitate creative problem solving (Orlet, 2008; Segal, 2004). Here, however, we consider the role of attentional disengagement. First, we review the creative benefits of task disengagement, such as incubation intervals, before considering evidence from inattention and cognitive-control perspectives. Finally, we present a novel study examining the potential benefits of task-switching on creative idea generation and discuss the potential relationship between mind-wandering, attentional flexibility, and creative problem solving.

## The Creative Benefits of Task Disengagement

Since Graham Wallas adopted the term "incubation" (Wallas, 1926) to describe one of his four proposed stages of the creative process (preparation, incubation, illumination, and verification), numerous studies have examined how taking a break from a problem may facilitate the generation of creative solutions. In keeping with Wallas's original conception, experiments have focused largely on two types of incubation. The first involves the redirection of attention away from the problem at hand via engagement in other effortful work (a "filled" incubation period). The second involves refraining entirely from directed mental engagement; that is, an "unfilled" incubation period in which mind-wandering presumably occurs. To examine possible benefits of incubation, the performance of groups engaged in one of the two types of incubation have been compared either to each other or to a group that engages in uninterrupted work (no incubation period).

A meta-analytic review from 2009 suggests that there exists an overall positive effect of incubation (Sio & Ormerod, 2009); in other words, creative problem solving is enhanced following an interruption as compared to no interruption. However, comparisons across individual studies present, at times, mixed and even conflicting results. While some studies suggest a benefit of unfilled incubation periods compared to filled incubation (e.g., Browne & Cruse, 1988), others have observed the opposite pattern of results (e.g., Patrick, 1986). When comparing incubation conditions to nonincubation conditions, the results are also not straightforward, with some studies finding an effect and others not (Sio & Ormerod, 2009). These inconsistent results may be due to the fact that incubation studies vary across numerous parameters, such as type of task (e.g., anagrams; Vul & Pashler, 2007; divergent thinking; Snyder et al., 2004), length of incubation (Both et al., 2004; Smith & Blankenship, 1989), and even dependent variables (fluency; Dodds et al., 2002; originality; Frith et al., 2021). These contextual factors appear to play an important role; indeed, the same meta-analytic review reported that longer preparation periods (prior to the incubation phase) seem to result in greater benefits, whereas filler tasks that involve lower cognitive demand may also lead to greater benefits when compared to both high-demand tasks and rest (at least for linguistic problems). Although the methodologies used in various studies differ, the main take-away seems to be that the effects of incubation are sensitive to other parameters present in the studies, which suggests a more nuanced, context-specific benefit of incubation.

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There have been several theories explaining how incubation intervals might facilitate creativity more generally (Orlet, 2008; Ritter & Dijksterhuis, 2014; Segal, 2004). Of particular importance here, however, is the "forgetting fixation theory" (Smith, 1995), which posits that task disengagement facilitates creativity by allowing one to forget fixated ideas, thereby reducing interference and increasing the accessibility of more novel ideas (Simon, 1977; Smith & Blankenship, 1989). Critically, under this view attentional disengagement is only beneficial to the extent that one has become fixated, and it may not provide any general creative benefits (Smith & Blankenship, 1991). It also seems plausible that disengagement during times when one has access to novel ideas would hinder, rather than help, creative performance.

Incubation effects have been shown in various types of creative tasks, such as alternate uses tasks (where participants come up with creative uses for everyday objects; Guilford, 1967) and insight problems (which require a change in perspective or mindset to solve; Sternberg & Davidson, 1995). In both cases, taking a break or incubating the idea can lead to more novel and creative solutions. These tasks may differ in many ways, but arriving at a solution in both tasks is believed to require divergent thinking, which involves forming loose and diverse associations and engaging in fluent and flexible thought processes (DeYoung et al., 2008; Jones et al., 2011; Webb et al., 2017). This type of thinking facilitates the retrieval of potentially relevant concepts, increasing the likelihood of finding a novel idea and an insightful solution (Ansburg, 2000). Theoretical explanations for incubation effects across different tasks are similar in that they propose that disengaging from the task allows for divergent thought and overcoming mental fixation by changing the way attention is allocated, either through withdrawal, redirection, or "broadening" (e.g., Segal, 2004; Zedelius & Schooler, 2015). Prior studies on the relationship between mind-wandering, inattention, and creativity have predominantly investigated idea-generation tasks, albeit without making a theoretical distinction between insight and idea-generation tasks (e.g., Rummel et al., 2021). Therefore, the focus of our review will be the general role that attentional disengagement plays in incubation effects across creativity tasks, and we will address any potential differences between tasks as they are relevant.

## The Role of a Wandering Mind in Facilitating Creative Problem Solving

A common form of attentional disengagement involves mind-wandering: the shift of attention from the external environment to internal thoughts (Smallwood & Schooler, 2006). The fact that people mind-wander so often, despite its evident costs, suggests that its experience might sometimes have value. In line with this possibility, anecdotes abound of individuals who have successfully generated solutions to problems while relinquishing attention from those problems (i.e., while mind-wandering, see Schooler et al., Chapter 7, this volume). Consistent with these anecdotes are the results of a study conducted by Baird et al. (2012), who examined whether performance on the alternate uses task (AUT) (Guilford, 1967) could be improved by increasing participants' rates of mind-wandering during an incubation period. In support of their hypothesis, Baird and colleagues found that an incubation period that was associated with high rates of mind-wandering led to improved AUT performance compared to an incubation period associated with lower rates of mind-wandering, leading to the proposal that mind-wandering does in fact appear to facilitate creativity. Additionally, Baird et al. found that participants who reported high levels of trait-level mind-wandering tended to perform better on the AUT than those reporting lower levels of trait-mind-wandering, indicating that those who mind-wander more frequently in their daily lives tend to be more creative.

Unfortunately, the incubation effect reported in Baird et al. (2012) does not appear to be reliable, as indicated by several failed attempts to conceptually replicate the finding (Leszczynski et al., 2017; Murray et al., 2021; Smeekens & Kane, 2016; Smith et al., 2022; Steindorf et al., 2020). That said, a more recent, and more ecologically valid study conducted by Gable et al. (2019) indicated that mind-wandering might indeed produce creative problem-solving benefits, but perhaps such benefits can only be observed in daily life wherein individuals have the opportunity to gain ideas from a rich sensory environment, as compared to a controlled, relatively sterile and artificial laboratory environment. In their study, Gable and colleagues had professional writers and physicists report on (a) their most creative idea of the day and (b) whether they were mind-wandering (defined as not working nor actively pursuing the problem) or not mind-wandering when their ideas came to them. Critically, results revealed that 20 percent of participants' most significant ideas were produced during periods of their daily lives wherein they were mind-wandering. Interestingly, Gable et al. also found that the ideas people generated during periods of mind-wandering were more likely to be associated with the Aha! experience that comes with overcoming an impasse on a problem. Thus, although the failures to replicate Baird et al.'s incubation effect would seem to cast doubt on the notion that mind-wandering can facilitate creative problem solving, Gable et al.'s findings – obtained in a naturalistic environment – point to the creative benefits of mind-wandering.

With respect to Baird et al.'s (2012) second finding – that trait mind-wandering is positively associated with creativity – subsequent research has successfully replicated this effect (e.g., Smeekens & Kane, 2016), indicating that there does appear to be a robust link between one's self-reported tendency to mind-wander in daily life and one's propensity to score high on indices of creativity (which dovetails nicely with Gable et al.'s 2019 findings). Extending this research, Agnoli et al. (2018) conducted a study in which they took a more nuanced view of mind-wandering by distinguishing between intentional and unintentional varieties of the experience (Seli et al., 2016) to determine whether intentionality matters when it comes to the link between mind-wandering and creativity. Consistent with previous research indicating that intentional and unintentional mind-wandering often behave differently (see Seli et al., 2016 for a review), Agnoli and colleagues found that, whereas intentional mind-wandering was positively associated with creativity, unintentional mind-wandering was negatively associated with creativity. Interestingly, these findings suggest that the type of wandering matters: whereas spontaneously occurring bouts of mind-wandering seem to hinder the creative process, deliberate bouts appear to bolster it. However, given the small size of the observed effects, and the measures used to draw their conclusions, we would caution against over-interpreting the importance of this result. Although promising, more work is required to confirm the presence of this effect and corroborate the link between the types of mind-wandering and creativity.

## Attentional Flexibility and Creative Cognition

Analogous to creative cognition, modern accounts of cognitive control view goal-directed behavior as striking a balance between two antagonistic control strategies (e.g., Brosowsky & Egner, 2021; Dreisbach, 2012; Egner, 2014). At the one end of the spectrum is attentional stability – a more constrained, focused attentional state that is resistant to distraction. At the other end is attentional flexibility – a relaxed, but distractible state, wherein goals can be rapidly updated to meet unexpected changes in the task (e.g., Brosowsky & Crump, 2018; Dreisbach, 2012; Egner, 2014). The desirability of biasing control along the spectrum is context dependent. In some contexts, like studying for an exam, it might be desirable to adopt a stable attentional control strategy to prevent potential distraction. In others, like cooking, where you might juggle multiple simultaneous tasks, it might be more desirable to adopt a flexible attentional control strategy.

One way that cognitive control is studied is in the context of task-switching paradigms wherein participants perform two different simple cognitive tasks, switching tasks from trial-to-trial (e.g., Brosowsky & Egner, 2021; Dreisbach & Fröber, 2019; Monsell, 2003). In these paradigms, attentional control is indexed by the switch cost – the difference in performance on task-switch versus task-repeat trials – and changes in the switch cost are taken as evidence for modulations of control along the flexibility–stability spectrum (Dreisbach & Fröber, 2019): whereas high switch costs are indicative of a stable (or inflexible) attentional control strategy, low switch costs are indicative of a flexible attentional control strategy.

Regulating control along the flexibility–stability spectrum is often characterized in terms of a cost-benefit trade-off, whereby the potential rewards of engaging in control are weighed against the intrinsic costs of doing so. Indeed, people often adapt their attentional strategies to reduce mental effort (Brosowsky & Egner, 2021; Kool et al., 2010) and maximize rewards (Braem, 2017) by exploiting the regularities in the task structure and offloading controlled processing to learning and memory processes (Brosowsky & Crump, 2016, 2018, 2021; Bugg, 2014). For instance, in many studies that manipulate the frequency of switching between tasks (e.g., Dreisbach & Haider, 2006; Leboe et al., 2008), conditions that require participants to switch frequently result in a reduction in switch costs, as compared to conditions wherein switching is infrequent. This is generally thought to occur because the high probability of switching induces a general state of attentional flexibility that benefits multitasking situations.

Within the context of creativity, there is little evidence that "task-switching", in the traditional sense, can benefit creativity. Rather than have participants switch between tasks, prior work has required participants to switch between prompts within the same task.[1] Interestingly, there is much evidence that switching between item prompts, as compared to

[1] In the traditional sense, task switching relies on the notion of a "task set": the organization of cognitive and mental processes that enable someone to complete a task (Monsell, 2003). Switching between task sets incurs a performance cost, thought to result from task set reconfiguration and/or inhibition of previously used task sets. Although it is difficult to provide a general definition of what constitutes a "task" (e.g., Rogers & Monsell, 1995), we would argue that generating an unusual use for a brick versus a bottle would be considered variants of a single task, rather than two different tasks. This, in our view, falls in line with the common usage of the term in the cognitive control literature.

continuously working on a single item prompt, can be beneficial for idea generation. For example, in a category generation task, participants produced more novel responses when they switched between two different ad hoc category prompts, rather than continuously working within one category prompt (though there was no difference for structured taxonomic categories; Smith et al., 2017). Similarly, in the AUT, participants must generate "creative and unusual uses" for a common object (e.g., a brick; Guilford, 1967). Here, again, switching between object prompts (e.g., brick, bottle, brick) tends to elicit more novel and creative responses than repeating the same prompt (George & Wiley, 2019; Lu et al., 2017). These results are interpreted in the same way as incubation intervals, where disengagement is thought to allow participants to inhibit old ideas and overcome fixation.

However, the cognitive-control literature brings another interpretation to bear on these results: increased task-switching induces attentional flexibility. Although attentional flexibility could certainly help overcome fixation when it does occur, it is also possible that it has a more general benefit by virtue of the multitasking nature of creative tasks. The AUT, for example, instructs participants to generate many "creative and unusual" uses for a common object. Such instructions imply that participants should (a) generate uses and (b) evaluate whether those uses are creative and/or unusual to determine if they should record their idea or continue the search. Presumably, to accomplish this task, people must quickly shift between generating and evaluating ideas. Likewise, one explanation as to why incubation benefits insight problem solving is that it allows the periodic redirection of attention away from and back to the problem (Segal, 2004; Salvi et al., 2015; Zedelius & Schooler, 2015). Attentional flexibility, then, should benefit creative problem solving by allowing one to switch between these two tasks quickly and efficiently. Thus, inducing attentional flexibility might be beneficial for creativity its own right, even when fixation does not occur (see also Siegel & Bugg, 2016).

## An Experimental Test of the Attentional Flexibility Hypothesis

In a new experiment, we explored whether attentional flexibility could improve creative idea generation. We designed a cognitive-control creativity task that combined a creative idea-generation task with a traditional task-switching manipulation. Unlike previous studies, where participants switched between prompts within the same task prompts (George & Wiley, 2019; Lu et al., 2017; Smith et al., 2017), in our experiment participants switched between two different tasks on each trial. In each trial, participants completed either a task where they generated a creative and unusual use for an everyday object (e.g., a brick), or a task where they evaluated the creativity of a use for a different object generated by another participant.

We then manipulated the frequency of switching between groups (75 percent vs. 25 percent switch rate; see Figure 8.1 for an illustration of the task). Like in traditional task-switching paradigms, we expected there to be a performance cost to switching between tasks, although this has not been demonstrated in prior studies examining prompt-switching and creativity. These performance costs ought to be reflected in participants' response times and creativity scores, with worse performance on switch versus repeat trials. We also expected, however, that increasing the

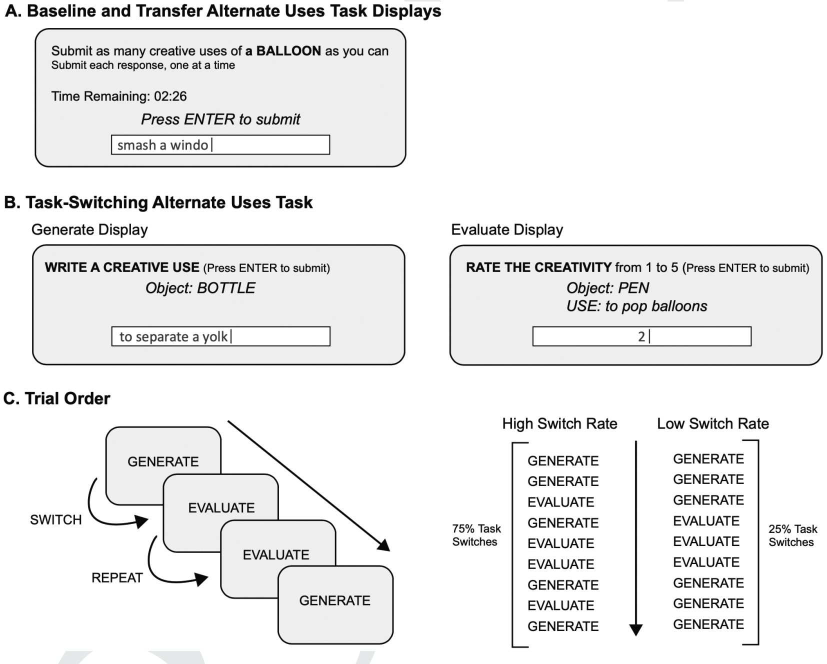


Figure 8.1 Figure 8.1A illustrates the task interface used in the baseline and transfer alternate uses tasks. Figure 8.1B illustrates the task interface used in the generation (left) and evaluation (right) trials of the task-switching alternate uses task. Figure 8.1C provides information about the trial order used in the task-switching alternate uses task, illustrating a switch versus repeat trial (left) and an example of the trial order used in the high switch rate versus low switch rate conditions.

frequency of switching would induce attentional flexibility and reduce the cost of switching between tasks (Dreisbach & Haider, 2006; Leboe et al., 2008). Consequently, we predicted larger switch costs for the low versus high switch-rate group.

Finally, participants completed two additional AUT phases: one prior to the task-switching phase and one following the task-switching phase. In these phases, participants completed a traditional version of the AUT: They received an everyday object prompt (e.g., brick) and a limited time to generate as many creative and unusual uses for the everyday object as possible. We included the pretask-switching AUT phase to account for individual differences in creative ability that may moderate the effect of our attentional flexibility induction (e.g., Patrick, 1986). The follow-up AUT allowed us to determine whether the effects of task-switching, our attentional flexibility induction, transfers to a phase where participants complete a traditional AUT. Again, from the cognitive-control perspective, increasing the frequency of task-switching induces a more general state of attentional flexibility. We hypothesized that this induction should transfer to the following phase when participants were no longer forced to switch between tasks.

To summarize our findings: we discovered that task-switching incurs costs in terms of both reaction time and creativity scores (as scored by two independent raters following Murray et al., 2021; Smith et al., 2022; Cronbach's alpha of 0.92), with participants performing worse on task-switch trials compared to task-repeat trials (see Figure 8.2A). We also found that the rate of forced task-switching influences the magnitude of these switch costs, with smaller costs for frequent task-switching compared to infrequent switching (see Figure 8.2B). This replicates a common finding in the task-switching literature (e.g., Dreisbach & Haider, 2006; Leboe et al., 2008), but not previously demonstrated within creativity tasks, and demonstrates that our manipulation of frequency induced attentional flexibility.

More importantly, we also examined how creativity scores varied across switch-rate groups as a function of creative ability (e.g., Patrick, 1986). Although we did not observe a general benefit to inducing attentional flexibility, we found that high-ability individuals performed better in the high-rate switching condition than in the low-rate condition, while low-ability participants performed worse in the high-rate condition than in the low-rate condition (see Figure 8.2C). This suggests that the effects of task-switching on creativity may depend on individual differences in creative ability. An identical pattern of results was also observed during the transfer

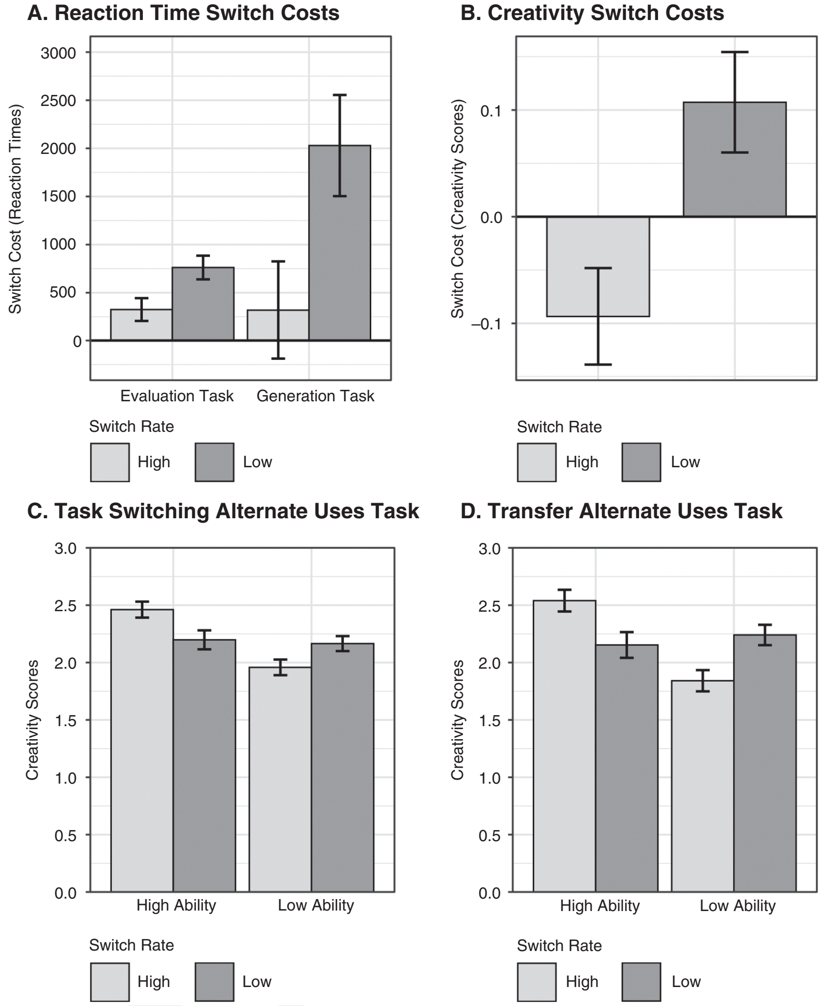


Figure 8.2 Reaction time switch costs (task-switch minus task-repeat performance) are displayed in Figure 8.2A as a function of the task (Evaluation vs. Generation) and condition (High vs. Low Switch Rate); positive numbers indicate that participants were slower on switch versus repeat trials. Figure 8.2B displays the creativity score switch costs (task-repeat minus task-switch performance) as a function of Switch Rate; A positive number indicates that participants had worse creativity scores on task-switch versus task-repeat trials. Figure 8.2C displays the creativity scores from the task-switching alternate uses task as a function of creative ability (High vs. Low) and Switch Rate. Similarly, Figure 8.2D shows creativity scores from the transfer alternate uses task. In all figures, error bars represent standard errors.

phase, wherein participants were no longer forced to switch between tasks (see Figure 8.2D). This result is particularly noteworthy as it suggests the attentional strategies adopted during the forced task-switching persisted and influenced performance in a similar manner in the following traditional AUT.

Prior studies, in contrast to ours, compared participants who switch between item prompts to participants who continuously work on a single prompt at a time. This work has found some general benefits for the switching group, which has been explained in terms of overcoming mental fixation (George & Wiley, 2019; Lu et al., 2017; Smith et al., 2017). Although here we compare a low-switch group to a high-switch group, presumably reducing the switch rate even further would have the same effect. Thus, an increase in attentional flexibility provides a plausible alternative explanation to the prior prompt-switching effects. However, there are other ways in which continuous work differs from task-switching – even at low rates – and these differences could have an impact on creative idea generation. Continuous work, for example, is thought to impair performance by causing fixation, which may not have occurred in our low-switch group. This might explain why prior work finds a general benefit, whereas here we find it depends on participant ability. Of course, these explanations are not mutually exclusive, and more research is needed to fully understand the relationship between attentional flexibility, mental fixation, and the generation of creative ideas.

Along these same lines, our current results are unlikely to be explained by traditional theories of incubation, such as the forgetting fixation hypothesis (Smith, 1995). First, participants were switching much more frequently than the typical incubation paradigm and it seems unlikely that participants were becoming fixated within the span of one or two responses. From the forgetting fixation perspective, we may have even predicted the opposite result in that the low-switch-rate participants should have been more likely to become fixated after four or five responses in a row and should have benefitted more from task disengagement. It also seems unlikely that our high-ability participants encountered fixation more often than our low-ability participants (e.g., Patrick, 1986). Finally, it is unclear whether one would expect that the effects of overcoming fixation during the task-switching phase would transfer to a phase where participants were not forced to switch tasks. However, as outlined in the introduction to this chapter, these results are to be expected from the cognitive-control perspective.

Although the shift in attentional flexibility between groups was validated in terms of switch costs, there are other possible explanations for our findings that should be investigated further. The alternating task, for instance, required participants to evaluate the creativity of others' responses. This could have provided participants with examples of alternative ways of thinking about objects, inspired them to think more creatively, or encouraged evaluative thinking. Gross & Schooler (2020), for example, examined explicit strategies for overcoming fixation. Participants in one group were shown their responses to a previous object and instructed to modify it for the current object. These participants performed better than a control group who were not shown examples or given explicit strategies. Thus, their own previous responses served as "examples" of other ways of thinking about objects and improved performance when explicitly instructed to use them as such.[2]

Finally, the diverging effects for high- versus low-ability individuals are also interesting from a cognitive-control perspective. As discussed in the introduction to this chapter, the effectiveness of adopting a flexible attentional strategy is context dependent; some tasks, like cooking, might benefit from adopting an attentionally flexible strategy to allow one to shift quickly and efficiency between multiple subtasks (e.g., cutting vegetables, melting butter, etc.), whereas other tasks, like studying or driving, might benefit from stability. In hindsight, it is perhaps unsurprising that ability would also be a major factor in determining which strategy one should adopt. We might expect, for instance, that a novice cook might not benefit from attentional flexibility to the extent that an expert chef would. In fact, as we observed here, the novice might perform better by adopting stable attentional strategies because of their lack of experience with the subtasks. Thus, it is not simply about adopting a single "best" attentional strategy, but, rather, matching the strategy appropriate to one's experience or skill-level.

## Is a Wandering Mind a Flexible Mind?

The results of our new experiment may help elucidate our inability to demonstrate the positive effects of mind-wandering on creativity in the lab (e.g., Murray et al., 2021) versus more ecological settings (Gable et al., 2019).

[2] To be clear, both groups in the current study saw the same number of examples and neither were given explicit instructions about how to use the examples. Moreover, the examples presented in the evaluation task were rarely responses rated high in creativity, making it unlikely that participants were consistently inspired by the examples. It is still possible, however, that interleaving examples at a higher frequency selectively enhanced creativity in the ways mentioned. A fruitful avenue for future research would be to examine the effect of various types of alternating tasks and determine the extent to which the current results are dependent on using an evaluation task.

In the lab, mind-wandering is typically measured by sampling a participant's thoughts throughout a focal task and estimating their frequency of mind-wandering (e.g., Seli et al., 2016) and its impact on task performance (e.g., Brosowsky et al., 2021a). Frequency measures, however, do not and cannot estimate how attentionally flexible an individual is. Attentionally flexible individuals, for instance, might mind-wander with a high frequency, but are capable of quickly and efficiently shifting their attention back when required (for a similar argument, see Brosowsky et al., 2020). Inflexible individuals, in contrast, might also mind-wander at a high frequency, but reorienting attention may be slow and effortful. Importantly, both individuals might report a high frequency of mind-wandering episodes, even though the time course and consequences of doing so are quite different. It is possible, then, that mind-wandering during a creative task or incubation period is beneficial only to the extent that the individual is attentionally flexible enough to exploit the brief disengagement and return to the task at hand. However, new measures are needed to capture the potentially important distinction between a flexible and inflexible mind wanderer and explore this idea further.

It is also interesting to note that participants in Gable et al. (2019) – who reported positive effects of mind-wandering in generating novel ideas and overcoming fixation – were experts in their relative fields (writers and physicists). Similarly, as we observed in the current study, frequent disengagement was only beneficial for the high-ability participants – those who were particularly adept at generating creative ideas. Mind-wandering, then, might only be beneficial in certain contexts, when one is well-versed in the task and problem-space. Future studies examining the influence of mind wandering on creativity would do well to consider whether participants have the necessary expertise in the task to exploit frequent disengagement.

Most research that has focused on the relationship between mind wandering and creativity has been done in the context of idea generation, which has been the focus of this chapter. But some studies have also examined whether mind-wandering may help overcome mental fixation to solve other types of creative problems, including insight problems. Insight problems are ill-defined problems that often lead to mental impasses and require some mental restructuring to overcome inappropriate fixation (Sternberg & Davidson, 1995). Solving an insight problem typically involves a feeling of insight or sudden understanding, accompanied by a change in mental representation that leads to the correct solution (Danek, 2018). Critically, similar to the generation of creative ideas, insight often happens during incubation periods (Wallas, 1926), which suggests that mind-wandering may facilitate insight problem solving for the same reasons that it would facilitate idea generation: by enabling divergent thought (Segal, 2004). However, the evidence on this is sparse and mixed. For instance, Tan et al. (2015), using a quasi-experimental design, found that participants who solved insight problems after an incubation period had engaged in more mind-wandering during the incubation period than those who did not solve the problem. More recently, however, Rummel et al. (2021) manipulated the level of mind-wandering during an incubation period by varying the difficulty of the incubation task (e.g., Brosowsky et al., 2021b) and found that increased mind-wandering *did not* result in increased problem solving. Thus, like much of the research on mind-wandering and creativity, there is some (albeit mixed) evidence to suggest that the frequency of mind-wandering during an incubation period is associated with insight problem solving. Future studies are also needed to examine the role of attentional flexibility and whether conditions might allow participants to exploit disengagement in insight problem solving.

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