CANADIAN PSYCHOLOGICAL ASSOCIATION
SOCIÉTÉ CANADIENNE DE PSYCHOLOGIE

Canadian Journal of Experimental Psychology /
Revue canadienne de psychologie expérimentale

ISSN: 1196-1961

https://doi.org/10.1037/cep0000400

The Costs and Benefits of Mind-Wandering: 13 Years On

Shivang Shelat and Jonathan W. Schooler
Department of Psychological and Brain Sciences, University of California, Santa Barbara

An abundance of evidence suggests that mind-wandering, or task-unrelated thought, poses significant detriments to performance. In 2013, however, Mooneyham and Schooler (2013) broadened mind-wandering's impact by reviewing emerging literature on both its costs and benefits. Research has now expanded enough that mind-wandering can no longer be treated as a simple failure of attention. In this sequel, we synthesize key findings from the past 13 years on when mind-wandering harms and when it helps. On the cost side, mind-wandering can reduce sensitivity to others' pain, spread lapses across peers in learning contexts, disrupt fine motor control, and weaken memory encoding. On the benefit side, mind-wandering is linked with improved memory consolidation, especially when thoughts return to recently learned material. Additional work suggests that mind-wandering can facilitate extraction of hidden probabilistic structure during statistical learning, support low-stakes decisions with less deliberative effort, and reduce semantic satiation during highly repetitive tasks. We also revisit mind-wandering's relation to mood, emphasizing that affective outcomes depend on more than just task-relatedness alone. This article outlines future directions to cultivate a sharper scientific understanding of how mind-wandering shapes different kinds of behavior.

Public Significance Statement

This review updates the past 13 years of evidence on costs and benefits of mind-wandering. We summarize new costs (reduced sensitivity to others' pain, "contagious" lapses in groups, disrupted fine motor control, weaker memory encoding) and new benefits (improved memory consolidation, better extraction of hidden patterns, reduced decision fatigue, dishabituation). Mind-wandering emerges as a familiar mental state that warrants more scientific study so we can learn to prevent its downsides while harnessing its upsides.

Keywords: mind-wandering, task-unrelated thought, attention, perceptual decoupling, behavioral performance

A moment of introspection reveals that our mind seems to have a mind of its own; it takes flights of fancy through rich streams of thought that have nothing to do with our external world. Cognitive scientists have operationalized mind-wandering as a shift in attention to task-unrelated thought (TUT; Seli et al., 2018; Smallwood & Schooler, 2015), and a great deal of effort has been dedicated to understanding its consequences. To study this phenomenon in the lab, participants are periodically interrupted while doing tasks to report the focus of their attention. An unsurprising finding is that TUT has negative consequences for many behaviors that seem to require attention: reading (Bonifacci et al., 2023), stimulus detection (Schooler et al., 2011), and more. Thus, TUT is thought of as an attentional *failure*, where something intrinsic and irrelevant "takes possession of the mind" (James, 1890) and causes task performance to suffer. A reflection on the aftermath of your own past mind-wandering episodes (when you read, study, or listen to a friend) makes this self-evident.

Nonetheless, the view that TUT represents a coarse attentional failure is incomplete. Mind-wandering reveals a fundamental property of attention: It oscillates across our external and internal worlds (Klein, 2022) of its own accord, and this oscillation produces costs but also benefits. Indeed, in 2013, Mooneyham and Schooler (2013) published a landmark review in the *Canadian Journal of Experimental Psychology* which outlined a set of context-dependent benefits of mind-wandering. This review has been cited more than 1,000 times as of 2026 and has shaped a decade of research showing that mind-wandering is heterogeneous in its effects on cognition. Mind-wandering was linked with planning for the future, problem-solving, and creative thinking. The literature on each of these has burgeoned, and in the 13 years since the initial review, new benefits and broader costs have emerged.

In this review, we build on Mooneyham and Schooler's (2013) foundation by synthesizing newly uncovered costs and benefits. Our goal is to provide a forward-looking article that fleshes out the field's future directions and methodological innovations. Recent work documents costs such as reduced sensitivity to others' pain,

Jean Saint-Aubin served as action editor.
Shivang Shelat https://orcid.org/0000-0001-9015-9709
Shivang Shelat is supported by a National Science Foundation Graduate Research Fellowship under Grant 2139319. Shivang Shelat thanks Margo Le, Massimo Romano, and Clark Romano for their insights.

Shivang Shelat contributed to conceptualization, investigation, writing–original draft, and writing–review and editing. Jonathan W. Schooler contributed to supervision and writing–review and editing.
Correspondence concerning this article should be addressed to Shivang Shelat, Department of Psychological and Brain Sciences, University of California, Santa Barbara, Psychology East, Santa Barbara, CA 93106, United States. Email: sshelat@ucsb.edu

induced lapsing across peers, disrupted fine motor control, and degraded memory encoding. In a separate vein, there is evidence of benefits to memory consolidation, statistical learning, decision-making, and dishabituation during repetitive tasks. Whereas Mooneyham and Schooler aimed to provide an exhaustive review, the field has since grown so much that it is not feasible to cover it in its entirety. Hence, we provide an illustrative review of several key developments, leaving out comprehensive treatment of now large and mixed literatures such as mind-wandering and creativity (Fox & Beaty, 2019; Murray et al., 2024; Schooler et al., 2024). This is done in order to reinforce mind-wandering as a complex phenomenon with heterogeneous consequences, more than just an attentional failure.

Costs of Mind-Wandering

Mind-wandering is theorized to degrade performance because attention shifts to processing or sustaining irrelevant thoughts instead of external information that guides task-related behaviors (Schooler et al., 2011). It is further proposed that attending thoughts consumes a limited pool of executive resources (Smallwood & Schooler, 2006). Accordingly, during mind-wandering, there are less executive resources available to process perceptual input, and behavior is less responsive to the environment. These general mechanisms of mind-wandering explain new costs in social, cognitive, and motor domains.

Reduces Sensitivity to Others' Pain

Beyond costs to task performance, mind-wandering may also blunt how we connect with others. One line of work shows that when attention drifts inward, people become less sensitive to others' suffering. Kam et al. (2014) showed participants pictures of hands in painful situations (e.g., a hand shut in a drawer) or neutral situations (e.g., a hand next to a drawer). Throughout the task, participants were probed on whether they were on-task or experiencing TUT. During TUT, they judged painful images as less painful than when they were on-task, even though their ratings of neutral images did not change. Put differently, TUT reduced how much pain participants thought someone else was experiencing.

The researchers also recorded brain activity via electroencephalogram. They found that during TUT, neural responses associated with evaluating the emotional meaning of the pictures were attenuated. The earliest, automatic reactions to seeing a hand in pain were unchanged, but the later stage of processing when the brain normally registers that an image is emotionally significant was reduced. Thus, TUT was not obscuring perception altogether but rather making people less likely to engage with the emotionality of what they saw.

This work highlights a social–affective cost of mind-wandering. When attention is elsewhere, we demonstrate reduced empathy-related processing. In daily life, we propose that attention might function as a social currency; when spent inward, less may be available to register others' cues and respond appropriately. Even brief TUTs could therefore decrease interpersonal connection by lowering the perceived severity of others' pain. Future work could test whether restoring external attention rescues empathic judgments in naturalistic settings and quantify downstream impacts on helping behaviors.

Beyond processing others' pain, it might be the case that mind-wandering interferes with listening and comprehension during conversations or processing of affective cues such as joy and frustration. Any of these forms of interference might mediate a negative impact of mind-wandering on social connectedness. Consistent with attention playing a significant social role, recent work demonstrates a correlation between mind-wandering and social desirability bias, such that high-bias participants are less likely to say that they experience TUT (Marcusson-Clavertz & Kjell, 2018; Shelat et al., 2025). Experimental designs that leverage dyads or groups might be able to capture the interference of TUT on interpersonal dynamics and the heightened under-reporting of TUT due to impression management concerns.

Diffuses Attentional Lapses Across Peers

In keeping with a theme of plausible new social consequences of mind-wandering, recent work demonstrates that mind-wandering spreads across learners (i.e., as a "contagion"). Forrin et al. (2021) showed this in a simulated classroom. Undergraduate students were paired with confederates who displayed either attentive behaviors (e.g., leaning forward or taking notes) or inattentive behaviors (e.g., slouching or looking around). Those seated with an inattentive peer reported less focus, took fewer notes, and remembered less of the lecture content in a posttest.

Building on this, McHale and Kane (2025) examined the attention contagion account in an online learning context. Participants viewed a lecture while accompanied by prerecorded peers who again behaved either attentively or inattentively. Those in the inattentive-peer condition reported significantly higher TUT rates than those in the attentive condition. This effect persisted even after excluding probe responses coded as environmental distraction, indicating that inattentive peers did not just merely capture others' attention momentarily (as a sort of physically salient external distractor) but rather also encouraged others to engage in internally generated TUT.

Although the manipulation increased TUT, it did not reduce performance on a posttest. The authors attributed this null result to limitations in the posttest's validity. Even so, the findings highlight a previously underappreciated social cost of mind-wandering: TUT can be contagious, spreading within groups and increasing disengagement in shared learning environments. This raises the possibility that the lapses of a few may cascade to shape the lapses of many.

There are two theoretical explanations for this phenomenon. Using cues from others' inattention, participants could either infer that the lecture is unimportant (via social appraisal; Manstead & Fischer, 2001) or that there is no active learning goal to pursue (via goal contagion; Dijksterhuis & Aarts, 2010). Both cases would lead to mind-wandering. Subsequent work should test how contagious TUT scales across group sizes and when/how contagion leads to consequences for comprehension and long-term retention.

It is worth noting that the inverse of this phenomenon implies that learning outcomes can be promoted via attentive confederates. This may explain why some of today's learners use "study with me" videos (i.e., self-shot videos of content creators studying; Kim &

Ryoo, 2025; Lee et al., 2021) to play in the background while they study. If such videos improve attention during learning, then it suggests that being in the presence of other focused people might help one's own focus regardless of what those others are focusing on. That is, the focus of attention might not have to be shared within a group in order to give a benefit to an individual learner's attention. It is a fruitful avenue of research for the future with implications for education.

Disrupts Fine Motor Control

Mind-wandering leaves its mark on our physical actions, disrupting the fine control of movement. In a demanding working memory task, M. R. Dias da Silva and Postma (2020) recorded people's mouse paths while they solved problems and, at the end of each set, asked about their thoughts. Even while TUT reports were rare, subtle changes in the mouse trajectories sometimes signaled when people had been mind-wandering.

M. R. Dias da Silva and Postma (2022) performed a follow-up study using a visuomotor tracking task in which participants used a mouse to follow a bouncing ball while responding to occasional oddball targets. Probes assessed TUT as well as graded ratings of the depth of perceptual decoupling. During TUT, participants missed more oddballs, responded more slowly, and were less accurate at tracking. Greater self-reported depth of perceptual decoupling predicted lower accuracy and less variable cursor velocities, consistent with graded decoupling of sensorimotor processing.

Taken together, these results suggest that mind-wandering weakens the moment-to-moment coupling between perception and action, and leaves a detectable motor signature. In practical terms, tasks that rely on continuous fine control (e.g., driving a car or piloting an aircraft; Karasinski & Robinson, 2022; Voinea et al., 2025) may be executed less responsively during TUT, even when the action is completed. Evidence shows that when drivers report mind-wandering, they brake more slowly in response to sudden events, drive faster, and follow more closely behind vehicles. Work in aviation is sparser, but some evidence shows that TUT occurs often during simulated flight and explains certain errors (Casner & Schooler, 2014, 2015). Given that TUT's cost to fine motor control manifests as an imprecise and less adaptive adjustment to incoming sensory information, future work may seek to leverage these empirical insights to track the wandering mind in real time based on fine-grained shifts in behavior (cf. M. R. Dias da Silva et al., 2022; Kuvar et al., 2023; Shelat et al., 2024). In other words, perturbations in motor actions could signal when TUT is ongoing. This will be useful in human–machine interactions, where upon the detection of a lapsing state, countermeasures can reel in the wandering mind before serious errors occur.

Degrades Encoding Into Memory

Mind-wandering's costs stretch far beyond performance in the moment, as evidenced by studies on attention and memory (Blondé et al., 2022). Items encountered during TUT are less likely to be retrieved from long-term memory, whether that item is a word or a complex scene. In one recent example, Marome et al. (2025) found that verbal and visual stimuli presented during TUT were less likely to be recognized in a later memory test. Extending this, Shelat et al. (2026) integrated a memory task with mind-wandering depth probes on a slider scale to measure finer shifts in sustained attentional state (see also Martarelli & Ovalle-Fresa, 2024). They showed that deeper TUT during the study of complex scenes predicted recalling fewer objects from those scenes in a subsequent visual free recall drawing task. Notably, the benefit of visual memorability (a property that predicts memory for something across observers; Bainbridge, 2019) did not appear in visual recall if the scene was encountered during mind-wandering. Converging evidence from sustained attention paradigms shows a similar degradation of encoding when lapses are indexed behaviorally instead of by self-report (Corriveau et al., 2025; deBettencourt et al., 2018). Altogether, the evidence illustrates that when attention decouples from our external environment, encoding processes are interrupted and memory suffers.

At the same time, not all off-task thought is equally detrimental. Researchers have asked participants to categorize their TUT as whether it was triggered by task-related stimuli (stimulus-dependent; e.g., a photo of a supermarket cueing a TUT about your shopping list) or not (stimulus-independent). Maillet et al. (2017) showed that stimulus-dependent TUTs were associated with better memory under shallow encoding conditions. One possibility is that these thoughts provided unintentional links between the stimulus and related knowledge in memory via elaborative processing. Such associations may have given extra routes for retrieval. However, the exact mechanisms that underlie this plausible benefit remain uncertain, and further work is needed to determine when stimulus-dependent TUT supports encoding.

The encoding costs reviewed here raise a question: If TUT interferes with learning in the moment, could it support what happens after learning ends? The work reviewed next suggests that under certain conditions, mind-wandering may play a constructive role during postencoding periods by supporting memory consolidation.

Benefits of Mind-Wandering

Promotes Memory Consolidation

A transient episode of mind-wandering may be enough to open an offline replay window or to enter wakeful rest (a state theorized to promote memory consolidation; Mildner & Tamir, 2019; Wamsley, 2022). At the trait level, Varma et al. (2019) tested whether individual differences in TUT propensity modulate consolidation in older adults. After encoding word–picture pairs, participants either rested quietly or performed a difficult task. Overall memory did not differ by condition, but trait TUT scores moderated an effect of postencoding consolidation based on the task type: High-TUT individuals retained more after rest than after the demanding task, whereas low-TUT individuals retained more after the demanding task than after rest. Thus, rest aided consolidation only for those disposed to experience attentional lapses, suggesting that trait differences determine whether offline states provide opportunities for reactivation (see also King & Nicosia, 2022). The authors speculated that, for high-TUT participants, thoughts related to the studied material emerged during rest, enabling improved retrieval later on. This initial work suggests that TUT has an adaptive function for memory depending on context and content.

A follow-up study by Nicosia and Balota (2024) examined whether cue-driven shifts in the content of TUT during a post-encoding retention period were associated with later memory performance. Older and younger adults studied stimulus clusters (e.g., picture–sound–word triads) and then performed an undemanding task designed to evoke TUT. During the undemanding task (serving as a retention interval), they were probed on whether their thoughts were related to the present task, the previous study phase, or unrelated to the experiment at all. A portion of the learned items were also re-presented as auditory or visual cues. Results indicated that the cues biased the content of TUT toward the material from the study phase and that, in the memory posttest, participants were generally faster to correctly recall cued versus uncued items. Additionally, those who experienced greater TUT related to the previous study phase gained the most from the cues. The pattern in the data is consistent with the notion that memory benefits arise when cues successfully bias ongoing thought toward the encoded material.

Consolidation of other types of memory appears to be enhanced by TUT as well. Girardeau et al. (2023) designed a naturalistic paradigm to test whether mind-wandering during a delay could enhance prospective memory, the ability to remember to do a previously determined intention. Adults first encoded a series of intentions (e.g., "at the florist's, buy a plant" or "at 16:30, send a message to a friend"). Afterward, they performed either an easy TUT-conducive task or a demanding task. Finally, participants entered a city modeled in virtual reality and freely navigated while carrying out pre-encoded intentions and new ones that were introduced midnavigation. Analyses revealed that higher TUT during the post-encoding retention task was linked to better prospective memory performance. Moreover, qualities of TUT uniquely related to dimensions of prospective memory. For intentions learned before the retention task, spontaneous past-oriented TUT predicted better recall of the intended action itself, whereas spontaneous episodic future-oriented TUT predicted better recall of when/where to execute that action. If self-generated thoughts were returning to the learned content during the postencoding task, mind-wandering here might represent a spontaneous form of rehearsal. Mind-wandering again appears to serve an adaptive function for memory in this high-fidelity virtual reality simulation.

This collective of work suggests that certain types of TUT may benefit consolidation under certain conditions. On top of that, the most recent relevant work exemplifies broad advances in the field by showing how immersive virtual reality can be used to test predictions about the wandering mind. The evidence, though, is far from conclusive; it is possible that certain types of mind-wandering (i.e., ruminative TUT) are actually detrimental for consolidation (Fell, 2025). Forthcoming work must expand on what types of mind-wandering guide reactivation versus disruption and also continue to explore what types of memory are benefited.

Facilitates Statistical Learning

We constantly face heaps of information, and one way our minds are suited to process this information is by learning regularities and engaging in predictive processing. This ability, however, might depend on attention processes (see Daw et al., 2005; Poldrack & Packard, 2003; Tóth et al., 2017). Evidence indicates that TUT may be conducive to statistical learning. Vékony et al. (2025) tested this by probing participants during a task with visual targets presented in probabilistic sequences. While immediate accuracy on the task dropped during TUT, there was evidence that participants more efficiently extracted hidden patterns. Those with TUT earlier in the task had greater statistical learning in initial blocks, suggesting that TUT may facilitate an early extraction of predictive structure.

Another study by Simor et al. (2025) replicated and extended these findings with electroencephalogram. Using a similar task with hidden structures within visually presented target streams, statistical learning was strongest during spontaneous TUT rather than deliberate TUT. Neural recording showed slow/delta oscillatory activity (which are signatures reminiscent of sleep-like offline states; Andrillon et al., 2021) that co-occurred with periods of TUT and predicted greater learning of probabilities. Although TUT hinders ongoing performance, the exciting new research reviewed here indicates that it may create a state optimized for extracting hidden patterns (see also Decker et al., 2023).

Prior to these two recent studies, work by Franklin et al. (2016) and Brosowsky et al. (2021) used different tasks to address similar questions regarding mind-wandering and statistical learning, reaching starkly different conclusions. Franklin et al. argued that TUT impaired implicit sequence learning, while Brosowsky et al. addressed some of their methodological limitations and concluded that mind-wandering had a null relationship with implicit sequence learning. As one possible explanation, Vékony et al. (2025) suggested that tasks which measure probabilistic rather than deterministic sequence learning are more sensitive to benefits from TUT. However, this distinction has yet to be directly tested. The primary takeaway is that the relationship between statistical learning and mind-wandering is promising yet still a little unclear, and this is partially attributable to variety in paradigms used. A direct comparison between different types of statistical learning would be a good next step, as would the consideration of a role for TUT in other types of learning such as the learned suppression of high probability spatial distractors (Gaspelin et al., 2025; Vicente-Conesa et al., 2024).

In the section before this, we framed mind-wandering as an offline state conducive to memory consolidation. The findings on statistical learning reviewed here are likely closely related, but it is useful to note differences in these literatures. Consolidation studies have so far emphasized how TUT may reactivate and stabilize specific, recently encoded episodes or intentions, making them easier to retrieve later on. By contrast, the statistical learning research has emphasized how TUT may promote the extraction of hidden regularities from noisy streams of input. Future research must explicitly distinguish between the mechanisms that give rise to these behavioral gains.

Mitigates Decision Fatigue

A third line of research suggests that mind-wandering may also serve an adaptive function in decision-making. Giblin et al. (2013) tested how "deciding by mind-wandering" affected postchoice satisfaction. Participants faced one of three sets of instructions. They were told to deliberately select a poster ("Think carefully about the posters until you identify the poster you most prefer"), to let their mind wander until a poster stood out ("Let your mind wander until the poster you feel most drawn to randomly comes to mind"), or to accept a randomly assigned poster. Interestingly, in an initial forecasting experiment, observers predicted that people who chose by mind-wandering would be less satisfied with their poster than those who deliberated. In reality, however, participants who decided via mind-wandering reported equal levels of satisfaction as those who deliberated and were more satisfied than those given a random poster.

This finding suggests the wandering mind can be strategically dispatched for low-stakes choices. One explanation is that engaging in TUT prevents overanalysis and comparisons across alternatives, processes that might increase regret (Wilson et al., 1993). By avoiding deliberation, TUT could allow individuals to save effort. Accordingly, TUT may help reduce decision fatigue (e.g., Pignatiello et al., 2020). Instead of expending time and energy to weigh different options, people could potentially rely on mind-wandering to guide them to a choice that feels just as satisfying.

Although evidence for this effect remains limited, the study highlights a potential benefit of TUT beyond memory or learning. A low-effort route to satisfaction is useful in contexts where costs of deliberation outweigh its gains. These initial results suggest a promising avenue of research. What are the risks of deciding by mind-wandering for more consequential decisions? Are the benefits restricted to basic preferences, like in Giblin et al.'s (2013) work? The answers to these questions would help better characterize TUT as a useful decision-making tool in real life.

Prevents Semantic Satiation

Mind-wandering might help by preserving meaning when a task becomes very repetitive. Mooneyham and Schooler (2016) empirically showed this using a basic word task. On each trial, participants saw the same word repeated and then saw a second word and judged whether the two words were related. They assessed semantic priming, the typical finding that people respond faster or more accurately when the second word is related to the first. Repeating the first word many times usually reduces semantic priming and makes the first word appear to lose its meaning (Smith & Klein, 1990). On long trials with many repeats, priming disappeared when people were on-task. When people were experiencing TUT, however, priming remained strong even after many repetitions.

Here, TUT resulted in the repeated word being processed less continuously. In turn, this attenuated the mind-numbing effect of repetition and helped protect the word's meaning. In the authors' follow-up experiment, they used Sustained Attention to Response Task (SART) omission errors as a behavioral proxy for deep TUT (Cheyne et al., 2009; Robertson et al., 1997; for a discussion on perceptual decoupling in the SART, see also Shelat & Giesbrecht, 2025) and again showed that lapsing attention protects semantic priming during highly repetitive trials.

In light of this, mind-wandering could function as a brief mental break that enables dishabituation and helps sustain performance during highly redundant tasks. In real life, this may matter for activities that involve constant exposure to the same material. Future work could test whether microbreaks or task designs that allow brief lapses of attention reduce semantic satiation. It may also be the case that the content or absorptiveness of TUT modulates whether this benefit appears.

Revisiting Mind-Wandering and Mood

Here we use the link between mind-wandering and mood, which was previously reviewed by Mooneyham and Schooler (2013), as an example to show how conclusions in this field have changed over time. Early work by Killingsworth and Gilbert (2010) suggested that participants are in a worse mood when mind-wandering, and moreover, mind-wandering seemed to precede negative mood rather than vice versa. This gave rise to their titular claim: "A wandering mind is an unhappy mind." Subsequent research, however, reveals a more complicated picture. Mood-related outcomes depend on what people are thinking about, not just the task-relatedness of the thought. Our revisiting of the mind-wandering–mood literature in this section is not meant to initiate a broader re-review of all domains covered by Mooneyham and Schooler, but rather to show how advances in measurement have helped refine our conclusions.

Evidence for this more nuanced view comes from work examining the content of off-task thought. Franklin et al. (2013) showed that when people are mind-wandering about topics that they find interesting, they find themselves in a more positive mood. Thus, the emotional consequences of mind-wandering depend on factors beyond whether the thought is on- or off-task. The content and qualities of thought are critical variables to consider when assessing links between emotions and mind-wandering.

Gross et al. (2024) replicated the main mood-related findings from Killingsworth and Gilbert (2010), showing that mood is worse when the mind wanders. However, they noted one limitation of the original work: The procedure did not ask about valence for non-mind-wandering states. By doing this, Gross et al. showed that a substantial source of mind-wandering's negative effect on mood is explained by negative thought contents. Again, a wandering mind is not doomed to make you unhappy; it seems to partially depend on the actual content and/or valence of the thought being experienced.

It is worth noting that the literature on this issue is still unsettled. Killingsworth and Gilbert's (2010) finding that mind-wandering precedes mood is echoed by Welz et al. (2018), although the latter found that it was linked with later increases in *positive* mood. Thus, they agree on temporal dynamics but disagree on mood outcome. Other authors have found the inverse of this temporal dynamic; Poerio et al. (2013) found that sadness preceded mind-wandering, but mind-wandering did not precede later sadness. Finally, at least one study has shown no significant time-lagged relationship between TUT and mood (Mills et al., 2021). Experimental manipulation studies on mood also remain mixed. Smallwood et al. (2009) used a posttask retrospective mind-wandering survey after the SART to show that a negative mood induction increased TUT. A later study by Jonkman et al. (2017) showed that this only reliably occurred for those with high attention-deficit/hyperactivity disorder–inattention symptoms when TUT was measured retrospectively and not when TUT was caught with probes. Most recently, Nayda and Takarangi (2025) showed that induced mood itself weakens over the course of the SART, raising concerns that this could muddy inferences from the effects of inductions on mind-wandering. Broad uncertainty in this subdomain of the literature makes it clear that the genuine link between mind-wandering and mood is still not yet fully understood. The thoughtful consideration of individual differences (Jonkman et al., 2017) and potential sources of noise (Nayda & Takarangi, 2025) will help us pin this link down.

Summary and Conclusions

Our minds wander often. This has been mostly cast as a problem since TUT hurts performance in a myriad of domains. Although TUT's costs have broadened in recent work, our review here also spotlights several benefits, challenging the view that TUT is solely a negative phenomenon. On new costs: TUT can reduce how sensitive we are to other people's pain, cause our peers to lapse, subtly disrupt motor control, and weaken memory encoding. These findings confirm that the consequences of lapsing attention spill over into social and physical domains. On new benefits: After learning, TUT can help stabilize memories, especially when thoughts return to previously studied material. Similarly, when attention defocuses, people may be better at picking up hidden patterns, boosting statistical learning. In decision-making, allowing choices to emerge during TUT can leave people just as satisfied as deliberation. TUT also preserves meaning during highly repetitive tasks. In these ways, TUT can guide consolidation, pattern learning, efficient decision-making, and the protection of semantic information.

Our goal in this review was to expand on the terrain already mapped by Mooneyham and Schooler (2013). Their framework and subsequent updates (e.g., for creativity, Fox & Beaty, 2019; Schooler et al., 2024; for reading, Bonifacci et al., 2023) remain excellent entry points for readers who want a comprehensive overview of mind-wandering. To provide an adequate sequel to Mooneyham and Schooler, we have focused here on new phenomena that are beyond the original catalog of performance decrements and gains (Table 1). We hope to have highlighted how mind-wandering shapes cognition in domains that were not previously emphasized and to have sketched out promising lines for future work.

Having a nuanced perspective on mind-wandering might help us answer a big question: Why is TUT so pervasive and relentless if it so often hurts us? A compelling answer posited by Mooneyham and Schooler (2013) is that the numerous benefits to cognition add up and make mind-wandering an adaptive feature of human experience born out of evolutionary processes, not just a "glitch in the system." It is likely that our flexible regulation of the wandering mind is an important skill and individual difference (Schubert et al., 2024) that allows it to help us in some contexts while preventing its consequences in others. This regulation might be enhanced through mindfulness training (Rahl et al., 2017), neurofeedback (Kawashima et al., 2023), or other means.

Various neuropsychological conditions are characterized by unique dynamics of thought (Kucyi et al., 2023). For example, attention-deficit/hyperactivity disorder is consistently linked to higher rates of mind-wandering (Lanier et al., 2021). This tendency is often cast only as a downside as it disrupts tasks. However, our review suggests more nuance. The very propensity to experience failures in sustained attention can also guide some advantages (Climie & Mastoras, 2015; Sedgwick et al., 2019). Acknowledging both the benefits and costs of mind-wandering allows us to reframe certain TUT-prone clinical conditions as a profile of strengths and weaknesses that may align well with particular environments.

A nuanced perspective on mind-wandering may also be important for extending its application to new technological innovations. For example, as artificial intelligence and automation become ubiquitous in the tools we use, task demands are attenuated and the mind is given more room to wander (Gouraud et al., 2018). These automated affordances for mind-wandering may provide valuable opportunities for future planning and big picture thinking (Casner & Schooler, 2014). However, in tasks where humans and intelligent systems collaborate ("human-in-the-loop"; see Gouraud et al., 2017; Plebe et al., 2022; Zhang et al., 2024; Zheng et al., 2023), the human must remain vigilant so as to catch errors made by automated systems. It is absolutely essential for the field to incorporate mind-wandering into models of human–system interaction to best understand how we can collaborate with machines safely and effectively, and a sharp consideration of the costs and benefits of TUT in this domain is timely.

Progress in the field of mind-wandering relies on improving measurement and recognizing that different types and topics of TUT

Table 1
A List of Representative Studies (2013–2026) on the Costs and Benefits of Mind-Wandering Since Mooneyham and Schooler's Initial Review

Selected article	Cost or benefit?	Type of observed effect
Kam et al. (2014)	Cost	Reduces sensitivity to others' pain
Forrin et al. (2021)	Cost	Diffuses attentional lapses across peers
McHale and Kane (2025)		
M. R. Dias da Silva and Postma (2020)	Cost	Disrupts fine motor control
M. R. Dias da Silva and Postma (2022)		
Marome et al. (2025)	Cost	Degrades encoding into memory
Shelat et al. (2026)		
Varma et al. (2019)	Benefit	Promotes memory consolidation
Nicosia and Balota (2024)		
Girardeau et al. (2023)		
Vékony et al. (2025)	Benefit	Facilitates statistical learning
Simor et al. (2025)		
Giblin et al. (2013)	Benefit	Mitigates decision fatigue
Mooneyham and Schooler (2016)	Benefit	Prevents semantic satiation

can have distinct consequences. Beyond standard thought probes that distinguish between on- and off-task thoughts, it will be beneficial to gather more data on phenomenological qualities and content across a multitude of contexts (Garg et al., 2025; Gross et al., 2021; Marome et al., 2025; Ortega et al., 2025). This will help define mind-wandering as a flexible state that decouples us from our external worlds but, under the right circumstances, allows access to forms of processing that focused attention cannot. The task for the next decade is to flesh out when it helps and when it hurts, and perhaps how to create environments that let us harness its benefits. We look forward to forthcoming work on this mental phenomenon that we all enjoy—sometimes.

Résumé

Une abondante littérature scientifique indique que l'errance mentale, ou pensée non liée à la tâche en cours, entraîne des coûts importants sur le plan de la performance. En 2013, toutefois, Mooneyham et Schooler ont élargi la portée des travaux sur l'errance mentale en examinant la littérature émergente sur ses effets bénéfiques. La recherche s'est depuis suffisamment développée pour que l'errance mentale ne soit plus considérée comme une simple perte d'attention. Dans cette suite, nous synthétisons les principales conclusions tirées des 13 dernières années de recherche afin de mieux comprendre dans quelles circonstances l'errance mentale est nuisible et dans lesquelles elle peut être bénéfique. En ce qui concerne les aspects négatifs, l'errance mentale peut entraîner une diminution de la capacité à ressentir la douleur d'autrui, favoriser la propagation des lapsus attentionnels entre pairs dans les contextes d'apprentissage, altérer la motricité fine et affaiblir l'encodage des souvenirs. En ce qui a trait aux effets bénéfiques, l'errance mentale est associée à une amélioration de la consolidation de la mémoire, particulièrement lorsque les pensées reviennent à des informations récemment apprises. D'autres travaux suggèrent également que l'errance mentale favorise l'extraction de structures probabilistes sous-jacentes dans le cadre de l'apprentissage statistique, soutient la prise de décisions à faible enjeu en nécessitant moins d'efforts délibératifs et réduit la satiation sémantique lors de tâches hautement répétitives. Nous réexaminons également le lien entre l'errance mentale et l'humeur, en soulignant que les effets sur l'état affectif ne dépendent pas uniquement du caractère lié ou non à la tâche de la pensée. Cet article propose des pistes de recherche futures pour une meilleure compréhension scientifique de l'influence de l'errance mentale sur différents types de comportements.

Mots-clés : errance mentale, pensée non liée à la tâche, attention, découplage perceptif, performance comportementale

References

Andrillon, T., Burns, A., Mackay, T., Windt, J., & Tsuchiya, N. (2021). Predicting lapses of attention with sleep-like slow waves. *Nature Communications*, *12*(1), Article 3657. https://doi.org/10.1038/s41467-021-23890-7

Bainbridge, W. A. (2019). Memorability: How what we see influences what we remember. In K. D. Federmeier & D. M. Beck (Eds.), *Psychology of learning and motivation* (Vol. 70, pp. 1–27). Elsevier. https://doi.org/10.1016/bs.plm.2019.02.001

Blondé, P., Girardeau, J.-C., Sperduti, M., & Piolino, P. (2022). A wandering mind is a forgetful mind: A systematic review on the influence of mind wandering on episodic memory encoding. *Neuroscience and Biobehavioral Reviews*, *132*, 774–792. https://doi.org/10.1016/j.neubiorev.2021.11.015

Bonifacci, P., Viroli, C., Vassura, C., Colombini, E., & Desideri, L. (2023). The relationship between mind wandering and reading comprehension: A meta-analysis. *Psychonomic Bulletin & Review*, *30*(1), 40–59. https://doi.org/10.3758/s13423-022-02141-w

Brosowsky, N. P., Murray, S., Schooler, J. W., & Seli, P. (2021). Attention need not always apply: Mind wandering impedes explicit but not implicit sequence learning. *Cognition*, *209*, Article 104530. https://doi.org/10.1016/j.cognition.2020.104530

Casner, S. M., & Schooler, J. W. (2014). Thoughts in flight: Automation use and pilots' task-related and task-unrelated thought. *Human Factors*, *56*(3), 433–442. https://doi.org/10.1177/0018720813501550

Casner, S. M., & Schooler, J. W. (2015). Vigilance impossible: Diligence, distraction, and daydreaming all lead to failures in a practical monitoring task. *Consciousness and Cognition*, *35*, 33–41. https://doi.org/10.1016/j.concog.2015.04.019

Cheyne, J. A., Solman, G. J., Carriere, J. S., & Smilek, D. (2009). Anatomy of an error: A bidirectional state model of task engagement/disengagement and attention-related errors. *Cognition*, *111*(1), 98–113. https://doi.org/10.1016/j.cognition.2008.12.009

Climie, E. A., & Mastoras, S. M. (2015). ADHD in schools: Adopting a strengths-based perspective. *Canadian Psychology/Psychologie canadienne*, *56*(3), 295–300. https://doi.org/10.1037/cap0000030

Corriveau, A., Chao, A. F., deBettencourt, M. T., & Rosenberg, M. D. (2025). Recognition memory fluctuates with sustained attention regardless of task relevance. *Psychonomic Bulletin & Review*, *32*(2), 714–728. https://doi.org/10.3758/s13423-024-02560-x

Daw, N. D., Niv, Y., & Dayan, P. (2005). Uncertainty-based competition between prefrontal and dorsolateral striatal systems for behavioral control. *Nature Neuroscience*, *8*(12), 1704–1711. https://doi.org/10.1038/nn1560

deBettencourt, M. T., Norman, K. A., & Turk-Browne, N. B. (2018). Forgetting from lapses of sustained attention. *Psychonomic Bulletin & Review*, *25*(2), 605–611. https://doi.org/10.3758/s13423-017-1309-5

Decker, A., Dubois, M., Duncan, K., & Finn, A. S. (2023). Pay attention and you might miss it: Greater learning during attentional lapses. *Psychonomic Bulletin & Review*, *30*(3), 1041–1052. https://doi.org/10.3758/s13423-022-02226-6

Dias da Silva, M. R., & Postma, M. (2020). Wandering minds, wandering mice: Computer mouse tracking as a method to detect mind wandering. *Computers in Human Behavior*, *112*, Article 106453. https://doi.org/10.1016/j.chb.2020.106453

Dias da Silva, M. R., Faber, M., de Andrade Branco, D. A., & Postma, M. (2022). Mind and body: The manifestation of mind wandering in bodily behaviors. In N. Dario & L. Tateo (Eds.), *New perspectives on mind-wandering* (pp. 59–75). Springer International Publishing. https://doi.org/10.1007/978-3-031-06955-0_4

Dias da Silva, M. R., & Postma, M. (2022). Straying off course: The negative impact of mind wandering on fine motor movements. *Journal of Motor Behavior*, *54*(2), 186–202. https://doi.org/10.1080/00222895.2021.1937032

Dijksterhuis, A., & Aarts, H. (2010). Goals, attention, and (un)consciousness. *Annual Review of Psychology*, *61*(1), 467–490. https://doi.org/10.1146/annurev.psych.093008.100445

Fell, J. (2025). *The role of mind wandering in memory consolidation: A status report*. OSF Preprint. https://osf.io/preprints/psyarxiv/42x8b_v1

Forrin, N. D., Huynh, A. C., Smith, A. C., Cyr, E. N., McLean, D. B., Siklos-Whillans, J., Risko, E. F., Smilek, D., & MacLeod, C. M. (2021). Attention spreads between students in a learning environment. *Journal of*

Experimental Psychology: Applied, *27*(2), 276–291. https://doi.org/10.1037/xap0000341

Fox, K. C., & Beaty, R. E. (2019). Mind-wandering as creative thinking: Neural, psychological, and theoretical considerations. *Current Opinion in Behavioral Sciences*, *27*, 123–130. https://doi.org/10.1016/j.cobeha.2018.10.009

Franklin, M. S., Mrazek, M. D., Anderson, C. L., Smallwood, J., Kingstone, A., & Schooler, J. W. (2013). The silver lining of a mind in the clouds: Interesting musings are associated with positive mood while mind-wandering. *Frontiers in Psychology*, *4*, Article 583. https://doi.org/10.3389/fpsyg.2013.00583

Franklin, M. S., Smallwood, J., Zedelius, C. M., Broadway, J. M., & Schooler, J. W. (2016). Unaware yet reliant on attention: Experience sampling reveals that mind-wandering impedes implicit learning. *Psychonomic Bulletin & Review*, *23*(1), 223–229. https://doi.org/10.3758/s13423-015-0885-5

Garg, A., Shelat, S., Gross, M. E., Smallwood, J., Seli, P., Taxali, A., Sripada, C. S., & Schooler, J. W. (2025). Opening the black box: Think aloud as a method to study the spontaneous stream of consciousness. *Consciousness and Cognition*, *128*, Article 103815. https://doi.org/10.1016/j.concog.2025.103815

Gaspelin, N., Ma, X., & Luck, S. J. (2025). Signal suppression 2.0: An updated account of attentional capture and suppression. *Psychonomic Bulletin & Review*, *32*(6), 2648–2668. https://doi.org/10.3758/s13423-025-02736-z

Giblin, C. E., Morewedge, C. K., & Norton, M. I. (2013). Unexpected benefits of deciding by mind wandering. *Frontiers in Psychology*, *4*, Article 598. https://doi.org/10.3389/fpsyg.2013.00598

Girardeau, J. C., Ledru, R., Gaston-Bellegarde, A., Blondé, P., Sperduti, M., & Piolino, P. (2023). The benefits of mind wandering on a naturalistic prospective memory task. *Scientific Reports*, *13*(1), Article 11432. https://doi.org/10.1038/s41598-023-37996-z

Gouraud, J., Delorme, A., & Berberian, B. (2017). Autopilot, mind wandering, and the out of the loop performance problem. *Frontiers in Neuroscience*, *11*, Article 541. https://doi.org/10.3389/fnins.2017.00541

Gouraud, J., Delorme, A., & Berberian, B. (2018). Influence of automation on mind wandering frequency in sustained attention. *Consciousness and Cognition*, *66*, 54–64. https://doi.org/10.1016/j.concog.2018.09.012

Gross, M., Raynes, S., Schooler, J. W., Guo, E., & Dobkins, K. (2024). When is a wandering mind unhappy? The role of thought valence. *Emotion*, *25*(3), 671–682. https://doi.org/10.1037/emo0001434

Gross, M. E., Smith, A. P., Graveline, Y. M., Beaty, R. E., Schooler, J. W., & Seli, P. (2021). Comparing the phenomenological qualities of stimulus-independent thought, stimulus-dependent thought and dreams using experience sampling. *Philosophical Transactions of the Royal Society B*, *376*(1817), Article 20190694. https://doi.org/10.1098/rstb.2019.0694

James, W. (1890). *The principles of psychology volume II*. Henry Holt.

Jonkman, L. M., Markus, C. R., Franklin, M. S., & van Dalfsen, J. H. (2017). Mind wandering during attention performance: Effects of ADHD-inattention symptomatology, negative mood, ruminative response style and working memory capacity. *PLOS ONE*, *12*(7), Article e0181213. https://doi.org/10.1371/journal.pone.0181213

Kam, J. W. Y., Xu, J., & Handy, T. C. (2014). I don't feel your pain (as much): The desensitizing effect of mind wandering on the perception of others' discomfort. *Cognitive, Affective, & Behavioral Neuroscience*, *14*(1), 286–296. https://doi.org/10.3758/s13415-013-0197-z

Karasinski, J., & Robinson, S. K. (2022). *Extending the structural model of the human pilot to include concurrent bandwidth Feedback* [AIAA SCITECH 2022 forum]. https://doi.org/10.2514/6.2022-0509

Kawashima, I., Nagahama, T., Kumano, H., Momose, K., & Tanaka, S. C. (2023). Pavlovian-based neurofeedback enhances meta-awareness of mind-wandering. *Neural Networks*, *158*, 239–248. https://doi.org/10.1016/j.neunet.2022.11.024

Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. *Science*, *330*(6006), Article 932. https://doi.org/10.1126/science.1192439

Kim, D., & Ryoo, D. (2025). Exploring self-regulated learning and achievement goal orientation in Generation Z through "study with me". *Interactive Learning Environments*, *33*(4), 3130–3146. https://doi.org/10.1080/10494820.2024.2437543

King, O., & Nicosia, J. (2022). The effects of wakeful rest on memory consolidation in an online memory study. *Frontiers in Psychology*, *13*, Article 932592. https://doi.org/10.3389/fpsyg.2022.932592

Klein, R. M. (2022). Thinking about attention: Successive approximations to a productive taxonomy. *Cognition*, *225*, Article 105137. https://doi.org/10.1016/j.cognition.2022.105137

Kucyi, A., Kam, J. W. Y., Andrews-Hanna, J. R., Christoff, K., & Whitfield-Gabrieli, S. (2023). Recent advances in the neuroscience of spontaneous and off-task thought: Implications for mental health. *Nature Mental Health*, *1*(11), 827–840. https://doi.org/10.1038/s44220-023-00133-w

Kuvar, V., Kam, J. W., Hutt, S., & Mills, C. (2023). Detecting when the mind wanders off task in real-time: An overview and systematic review. *Proceedings of the 25th International Conference on Multimodal Interaction* (pp. 163–173).

Lanier, J., Noyes, E., & Biederman, J. (2021). Mind wandering (internal distractibility) in ADHD: A literature review. *Journal of Attention Disorders*, *25*(6), 885–890. https://doi.org/10.1177/1087054719865781

Lee, Y., Chung, J. J. Y., Song, J. Y., Chang, M., & Kim, J. (2021). Personalizing ambience and illusionary presence: How people use "study with me" videos to create effective studying environments. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (pp. 1–13).

Maillet, D., Seli, P., & Schacter, D. L. (2017). Mind-wandering and task stimuli: Stimulus-dependent thoughts influence performance on memory tasks and are more often past-versus future-oriented. *Consciousness and Cognition*, *52*, 55–67. https://doi.org/10.1016/j.concog.2017.04.014

Manstead, A. S. R., & Fischer, A. H. (2001). Social appraisal: The social world as object of and influence on appraisal processes. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 221–232). Oxford University Press. https://doi.org/10.1093/oso/9780195130072.003.0012

Marcusson-Clavertz, D., & Kjell, O. N. E. (2018). Psychometric properties of the spontaneous and deliberate mind wandering scales. *European Journal of Psychological Assessment*, *35*(6), 878–890. https://doi.org/10.1027/1015-5759/a000470

Marome, B., Shelat, S., & Schooler, J. W. (2025). The phenomenology of encoding: Experience sampling reveals thoughts associated with the retention of visual and verbal materials. *Consciousness and Cognition*, *136*, Article 103958. https://doi.org/10.1016/j.concog.2025.103958

Martarelli, C. S., & Ovalle-Fresa, R. (2024). In sight, out of mind? Disengagement at encoding gradually reduces recall of location. *Quarterly Journal of Experimental Psychology*, *77*(1), 42–56. https://doi.org/10.1177/17470218231159656

McHale, M. W., & Kane, M. J. (2025). The effects of attention contagion on task-unrelated thought in a virtual lecture. *Collabra: Psychology*, *11*(1), Article 140709. https://doi.org/10.1525/collabra.140709

Mildner, J. N., & Tamir, D. I. (2019). Spontaneous thought as an unconstrained memory process. *Trends in Neurosciences*, *42*(11), 763–777. https://doi.org/10.1016/j.tins.2019.09.001

Mills, C., Porter, A. R., Andrews-Hanna, J. R., Christoff, K., & Colby, A. (2021). How task-unrelated and freely moving thought relate to affect: Evidence for dissociable patterns in everyday life. *Emotion*, *21*(5), 1029–1040. https://doi.org/10.1037/emo0000849

Mooneyham, B. W., & Schooler, J. W. (2013). The costs and benefits of mind-wandering: A review. *Canadian Journal of Experimental Psychology/Revue Canadienne de Psychologie Expérimentale*, *67*(1), 11–18. https://doi.org/10.1037/a0031569

Mooneyham, B. W., & Schooler, J. W. (2016). Mind wandering minimizes mind numbing: Reducing semantic-satiation effects through absorptive lapses of attention. *Psychonomic Bulletin & Review*, *23*(4), 1273–1279. https://doi.org/10.3758/s13423-015-0993-2

Murray, S., Liang, N., Brosowsky, N., & Seli, P. (2024). What are the benefits of mind wandering to creativity? *Psychology of Aesthetics, Creativity, and the Arts*, *18*(3), 403–416. https://doi.org/10.1037/aca0000420

Nayda, D. M., & Takarangi, M. K. T. (2025). Does mood change during a mind-wandering task? *Cognitive Therapy and Research*. Advance online publication. https://doi.org/10.1007/s10608-025-10626-w

Nicosia, J., & Balota, D. A. (2024). Targeted memory reactivation and consolidation-like processes during mind-wandering in younger and older adults. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *50*(2), 266–286. https://doi.org/10.1037/xlm0001187

Ortega, J. R., Gross, M. E., & Schooler, J. W. (2025). When life is but a dream: Does transliminality predict continuity of thought across the sleep–wake cycle? *Philosophy and the Mind Sciences*, *6*. https://doi.org/10.33735/phimisci.2025.10272

Pignatiello, G. A., Martin, R. J., & Hickman, R. L., Jr. (2020). Decision fatigue: A conceptual analysis. *Journal of Health Psychology*, *25*(1), 123–135. https://doi.org/10.1177/1359105318763510

Plebe, A., Rosati Papini, G. P., Cherubini, A., & Da Lio, M. (2022). Distributed cognition for collaboration between human drivers and self-driving cars. *Frontiers in Artificial Intelligence*, *5*, Article 910801. https://doi.org/10.3389/frai.2022.910801

Poerio, G. L., Totterdell, P., & Miles, E. (2013). Mind-wandering and negative mood: Does one thing really lead to another? *Consciousness and Cognition*, *22*(4), 1412–1421. https://doi.org/10.1016/j.concog.2013.09.012

Poldrack, R. A., & Packard, M. G. (2003). Competition among multiple memory systems: Converging evidence from animal and human brain studies. *Neuropsychologia*, *41*(3), 245–251. https://doi.org/10.1016/S0028-3932(02)00157-4

Rahl, H. A., Lindsay, E. K., Pacilio, L. E., Brown, K. W., & Creswell, J. D. (2017). Brief mindfulness meditation training reduces mind wandering: The critical role of acceptance. *Emotion*, *17*(2), 224–230. https://doi.org/10.1037/emo0000250

Robertson, I. H., Manly, T., Andrade, J., Baddeley, B. T., & Yiend, J. (1997). 'Oops!': Performance correlates of everyday attentional failures in traumatic brain injured and normal subjects. *Neuropsychologia*, *35*(6), 747–758. https://doi.org/10.1016/S0028-3932(97)00015-8

Schooler, J. W., Smallwood, J., Christoff, K., Handy, T. C., Reichle, E. D., & Sayette, M. A. (2011). Meta-awareness, perceptual decoupling and the wandering mind. *Trends in Cognitive Sciences*, *15*(7), 319–326. https://doi.org/10.1016/j.tics.2011.05.006

Schooler, J. W., Gross, M. E., Zedelius, C. M., & Seli, P. (2024). Mind wondering: Curious daydreaming and other potentially inspiring forms of mind wandering? In C. Salvi, S. Smith, & J. Wiley (Eds.), *The emergence of insight*. Cambridge University Press. https://doi.org/10.1017/9781009244244.007

Schubert, A. L., Frischkorn, G. T., Sadus, K., Welhaf, M. S., Kane, M. J., & Rummel, J. (2024). The Brief Mind Wandering Three-Factor Scale (BMW-3). *Behavior Research Methods*, *56*(8), 8720–8744. https://doi.org/10.3758/s13428-024-02500-6

Sedgwick, J. A., Merwood, A., & Asherson, P. (2019). The positive aspects of attention deficit hyperactivity disorder: A qualitative investigation of successful adults with ADHD. *Attention Deficit and Hyperactivity Disorders*, *11*(3), 241–253. https://doi.org/10.1007/s12402-018-0277-6

Seli, P., Kane, M. J., Smallwood, J., Schacter, D. L., Maillet, D., Schooler, J. W., & Smilek, D. (2018). Mind-wandering as a natural kind: A family-resemblances view. *Trends in Cognitive Sciences*, *22*(6), 479–490. https://doi.org/10.1016/j.tics.2018.03.010

Shelat, S., Clubb, A. R., Giesbrecht, B., & Schooler, J. (2025). *Social desirability bias obscures mind-wandering reports*. OSF Preprint. https://osf.io/preprints/psyarxiv/d234m_v3

Shelat, S., & Giesbrecht, B. (2025). Perceptual decoupling in the sustained attention to response task is likely: Comment on Bedi, Russell, & Helton (2024). *Experimental Brain Research*, *243*(4), Article 86. https://doi.org/10.1007/s00221-025-07032-9

Shelat, S., Marome, B., Lopez, C., Giesbrecht, B., & Schooler, J. W. (2026). The veil of distraction: Mind-wandering and memorability jointly shape visual recognition and recall. *Memory & Cognition*. Advance online publication. https://doi.org/10.3758/s13421-025-01811-z

Shelat, S., Schooler, J. W., & Giesbrecht, B. (2024). Predicting attentional lapses using response time speed in continuous performance tasks. *Frontiers in Cognition*, *3*, Article 1460349. https://doi.org/10.3389/fcogn.2024.1460349

Simor, P., Vékony, T., Farkas, B. C., Szalárdy, O., Bogdány, T., Brezóczki, B., Csifcsák, G., & Németh, D. (2025). Mind wandering during implicit learning is associated with increased periodic EEG activity and improved extraction of hidden probabilistic patterns. *Journal of Neuroscience*, *45*(19), Article e1421242025. https://doi.org/10.1523/JNEUROSCI.1421-24.2025

Smallwood, J., Fitzgerald, A., Miles, L. K., & Phillips, L. H. (2009). Shifting moods, wandering minds: Negative moods lead the mind to wander. *Emotion*, *9*(2), 271–276. https://doi.org/10.1037/a0014855

Smallwood, J., & Schooler, J. W. (2006). The restless mind. *Psychological Bulletin*, *132*(6), 946–958. https://doi.org/10.1037/0033-2909.132.6.946

Smallwood, J., & Schooler, J. W. (2015). The science of mind wandering: Empirically navigating the stream of consciousness. *Annual Review of Psychology*, *66*(1), 487–518. https://doi.org/10.1146/annurev-psych-010814-015331

Smith, L., & Klein, R. (1990). Evidence for semantic satiation: Repeating a category slows subsequent semantic processing. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *16*(5), 852–861. https://doi.org/10.1037/0278-7393.16.5.852

Tóth, B., Janacsek, K., Takács, Á., Kóbor, A., Zavecz, Z., & Nemeth, D. (2017). Dynamics of EEG functional connectivity during statistical learning. *Neurobiology of Learning and Memory*, *144*, 216–229. https://doi.org/10.1016/j.nlm.2017.07.015

Varma, S., Takashima, A., Fu, L., & Kessels, R. P. C. (2019). Mindwandering propensity modulates episodic memory consolidation. *Aging Clinical and Experimental Research*, *31*(11), 1601–1607. https://doi.org/10.1007/s40520-019-01251-1

Vékony, T., Farkas, B. C., Brezóczki, B., Mittner, M., Csifcsák, G., Simor, P., & Németh, D. (2025). Mind wandering enhances statistical learning. *iScience*, *28*(2), Article 111703. https://doi.org/10.1016/j.isci.2024.111703

Vicente-Conesa, F., Castillejo, I., & Vadillo, M. A. (2024). Working memory load does not interfere with distractor suppression in the additional singleton task. *Attention, Perception, & Psychophysics*, *86*(6), 2003–2012. https://doi.org/10.3758/s13414-024-02940-4

Voinea, G.-D., Gîrbacia, F., Boboc, R. G., & Postelnicu, C.-C. (2025). The mind-wandering phenomenon while driving: A systematic review. *Information*, *16*(8), Article 681. https://doi.org/10.3390/info16080681

Wamsley, E. J. (2022). Offline memory consolidation during waking rest. *Nature Reviews Psychology*, *1*(8), 441–453. https://doi.org/10.1038/s44159-022-00072-w

Welz, A., Reinhard, I., Alpers, G. W., & Kuehner, C. (2018). Happy thoughts: Mind wandering affects mood in daily life. *Mindfulness*, *9*(1), 332–343. https://doi.org/10.1007/s12671-017-0778-y

Wilson, T. D., Lisle, D. J., Schooler, J. W., Hodges, S. D., Klaaren, K. J., & LaFleur, S. J. (1993). Introspecting about reasons can reduce post-choice satisfaction. *Personality and Social Psychology Bulletin*, *19*(3), 331–339. https://doi.org/10.1177/0146167293193010

Zhang, S., Yu, J., Xu, X., Yin, C., Lu, Y., Yao, B., Tory, M., Padilla, L. M., Caterino, J., Zhang, P., & Wang, D. (2024). Rethinking human–AI collaboration in complex medical decision making: A case study in sepsis diagnosis. *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (pp. 1–18).

Zheng, J., Shelat, S., & Marquez, J. J. (2023). Facilitating crew-computer collaboration during mixed-initiative space mission planning. *Conference for Human–Computer Interaction for Space Exploration, SpaceCHI 3.0*.

Received February 10, 2026
Revision received April 23, 2026
Accepted May 1, 2026 ■