

This chapter provides an introduction to the philosophy of mind-wandering. It begins with a philosophical critique of the standard psychological definitions of mind-wandering as task-unrelated thought or stimulus-independent thought. Although these definitions have helped bring mind-wandering research onto center stage in psychology and cognitive neuroscience, they have substantial limitations. They do not account for the dynamics of mind-wandering, task-unrelated thought that does not qualify as mind-wandering, or the ways in which mind-wandering can be task-related. The chapter reviews philosophical accounts that improve upon the current psychological definitions, in particular an account of mind-wandering as “unguided thinking.” It critically assesses the view that mind-wandering can be defined as thought lacking meta-awareness and cognitive agency, as well as the view that mind-wandering is disunified thinking. The definition of mind-wandering as unguided thinking not only is conceptually and phenomenologically precise, but also can be operationalized in a principled way for empirical research.

mind-wandering, psychology, neuroscience, cognition, task-unrelated thought, stimulus-independent thought, mental action

Part III

Philosophical, Evolutionary, and Historical Perspectives

Chapter 8

The Philosophy of Mind-Wandering

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Before the twenty-first century, research on the wandering mind was “relegated to the backwaters of mainstream empirical psychology” (Smallwood & Schooler, 2006, p. 956). Not anymore. Indeed, some researchers have dubbed our time “the era of the wandering mind” (Callard, Smallwood, Golchert, & Margulies, 2013). Nevertheless, because the cognitive science of mind-wandering is so young, foundational questions remain unanswered. In particular, there is no consensus about how to define mind-wandering (Christoff, 2012; Irving, 2015), although recent philosophical work on mind-wandering has addressed this foundational issue (Carruthers, 2015; Dorsch, 2015; Irving, 2015; Metzinger, 2013, 2015; Sutton, 2010; Thompson, 2015). In this chapter we provide an introduction to the philosophy of mind-wandering, and we argue that mind-wandering is best defined as “unguided thinking” (Irving, 2015).

We begin by criticizing the standard definitions of mind-wandering in psychology, according to which mind-wandering is “task-unrelated thought” or “stimulus-independent thought” (see Irving, 2015). Using these definitions, scientists have produced important findings and have brought mind-wandering onto center stage in psychology and cognitive neuroscience (Schooler, Smallwood, Christoff, Handy, Reichle, & Sayette, M. A., 2011; Smallwood & Schooler, 2006, 2015). Nevertheless, these definitions have substantial limitations that must be overcome in order for research to move forward. Specifically, the standard definitions do not account for (1) the

dynamics of mind wandering, (2) task-unrelated thought that does not qualify as mind-wandering, and (3) the ways that mind-wandering can be task-related.

We then survey three philosophical accounts that improve upon the current psychological definitions in various ways. We first present our account of mind-wandering as “unguided thinking” (Irving, 2015). Next we review Thomas Metzinger’s (2013) view that mind-wandering can be defined as thought lacking meta-awareness and cognitive agency, as well as Peter Carruthers’s (2015) and Fabian Dorsch’s (2015) definitions of mind-wandering as disunified thinking. We argue that these views are inadequate, and we show that our definition of mind-wandering as unguided thinking not only is conceptually and phenomenologically precise, but also can be operationalized in a principled way for empirical research.

Mind-Wandering as Task-Unrelated Thought or Stimulus-Independent Thought

Experientially, we all know mind-wandering when we see it. On the commute home, a programmer’s thoughts drift away from the sights and sounds of the subway car. At first she imagines the chicken she is brining for dinner. She can almost taste the thyme and rosemary when, suddenly, a line of code pops into her head. She plays with the code for a while, and then, smiling, remembers a joke she heard today...and so on. Clearly, the programmer’s mind is wandering. But what exactly makes her train of thought a case of mind-wandering? What precisely is mind-wandering?

Scientists in the empirical literature typically define mind-wandering as thought that is “task-unrelated” or “stimulus-independent,” or both. For example, Smallwood and Schooler define mind-wandering as “a shift in the contents of thought away from an

ongoing task and/or from events in the external environment to self-generated thoughts and feelings” (Smallwood & Schooler, 2015, p. 488). This definition correctly identifies paradigm cases of mind-wandering. For example, the programmer’s wandering thoughts are unrelated to her ongoing task—commuting home—and to her external environment—the subway car.

Nevertheless, this definition abstracts away from a central feature of mind-wandering, namely, its *dynamics* (Christoff, 2012; Irving, 2015). Wandering trains of thought unfold in a distinctive way over time. Experientially, the thoughts seem to drift freely from one topic (a line of code) to another one (a joke). Irving (2016) notes that the term “mind-wandering” reflects these dynamics: according to the *Oxford English Dictionary* (online), “to wander” means “to move hither and thither without fixed course or certain aim.” The preceding definition of mind-wandering, however, focuses only on individual mental states and seeks to determine whether their content is related to one’s task or environment. This focus tells us nothing about how trains of thought unfold over time. As we now argue, this definition of mind-wandering in static terms is unsatisfactory in two ways: it cannot differentiate between mind-wandering and other kinds of task-unrelated and stimulus-independent thought; and it cannot account for the fact that mind-wandering can be task-related.

Varieties of Task-Unrelated Thought

Current definitions of mind-wandering cannot distinguish it from depressive rumination, which is typically task-unrelated and stimulus-independent, but which has dynamics that fundamentally differ from that of mind-wandering (Irving, 2016).

Rumination is “a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms. . . . People who are ruminating remain fixated on the problems and on their feelings about them” (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

Rumination is strongly associated with major depressive disorder, but also is found in the normal population (Zetsche & Joormann, 2011). For example, a non-depressed teacher might ruminate about how to discipline a problem student.

Rumination is frequently task-unrelated and stimulus independent. For example, when a teacher ruminates about a problem student during her commute home, her thoughts are unrelated to her current task (commuting home) and perceptual environment (the subway train). Current researchers, therefore, classify rumination as a form of mind-wandering (e.g., Smallwood & Schooler, 2006, 2015).

Rumination, however, seems antithetical to mind-wandering. Consider the ruminating teacher in contrast to the programmer whose mind is wandering. Both individuals have task-unrelated and stimulus-independent thoughts on the commute home. But the dynamics of their thoughts could hardly contrast more: whereas the teacher’s thoughts fixate on her problem student, the programmer’s thoughts drift from dinner to her computer code to a joke. In general, whereas rumination remains fixed on a single topic, mind-wandering drifts from one topic to the next. One has not wandered—“moved hither and thither”—if one has stayed on a single spot.

Mind-Wandering and Goal-Directed Thought: A Dilemma

Current definitions of mind-wandering face a dilemma concerning the relationship between mind-wandering and cognitive tasks. On the one hand, if we say that all

stimulus-independent thinking is mind-wandering, then some mind-wandering will be task-related, because some stimulus-independent thinking is goal-directed. On the other hand, if we say that mind-wandering must be task-unrelated thinking, then we run afoul of empirical evidence that suggests that mind-wandering can be task-related. Let us explain each alternative and its problems in turn.

Suppose we define mind-wandering as any and all stimulus-independent thought. Smallwood and Schooler adopt this view, because they define mind-wandering as “a shift in the contents of thought away from an ongoing task and/or *from events in the external environment*” (2015, p. 488, emphasis added). According to the most restrictive conception in the literature, stimulus-independent mental states not only are non-perceptual states, but also are unrelated to any immediately present perceptual stimuli (Schooler, Smallwood, Christoff, Handy, Reichle, & Sayette, 2011). For example, imagining or thinking about kicking the pigeon in front of you would not count as a stimulus-independent thought, but rather as a stimulus-related thought. Similarly, in a visual detection experiment, thinking “these pictures are flashing by too quickly,” would count as a stimulus-related thought, not a stimulus-independent one. Nevertheless, even this restricted specification of what is required for a thought to be stimulus-independent—that it be a non-perceptual state unrelated to any immediately present perceptual stimuli—classifies much of our goal-directed thought as stimulus-independent and hence (counterintuitively) as mind-wandering.

Consider a mathematician solving a proof in her head or a politician rehearsing a speech under her breath. Both women have thoughts unrelated to their external environments, so they count as mind-wandering, despite their thinking being goal-

directed. The problem is that one's thoughts cannot *wander*—"move hither and thither without fixed course or certain aim"—if they are directed by a goal. Indeed, theorists at least since Thomas Hobbes (1651) have defined mind-wandering by contrasting it to goal-directed cognition. In one of the first European philosophical discussions of mind-wandering, Hobbes states that thoughts that "wander . . . seem impertinent to each other, as in a Dream" (1651, p. 20). In contrast, he wrote that goal-directed thinking is "more constant; as being regulated by some desire, and designe. For the impression made by such things as wee desire, or feare, is strong and permanent, or, (if it cease for a time,) of quick return" (1651, pp. 20–21).

To distinguish mind-wandering from goal-directed thought, we could maintain that all mind-wandering is task-unrelated thought. According to this conception, neither the mathematician thinking about her proof nor the politician thinking about her speech is mind-wandering, because both are thinking about a task.

But now we face the second horn of the dilemma: *Some mind-wandering is task-related* (Irving, 2016). Consider our vignette of a programmer whose mind is wandering on her commute home. Her thoughts drift to two personal goals—making dinner and writing code. Empirical evidence indicates that our minds often wander in this way to personal goals (Klinger, 1999). Indeed, one study reported that at least 25% of a person's wandering thoughts are about a "specific goal (defined as an objective or desired result that an individual endeavors to achieve)" (Baird, Smallwood, & Schooler, 2011, p. 1606). Another study found similar results with an experimentally induced goal. Participants were told that they would be quizzed on the names of US states after a "concentration task" (Morsella, Ben-Zeev, Lanska, & Bargh, 2010). When participants had this goal,

approximately 70% of their wandering thoughts were about geography (especially US state names). In contrast, the minds of participants in control conditions wandered to geography less than 10% of the time. This finding suggests that goals *cause* our minds to wander to goal-relevant information.

To see how such findings bear on the current definitions of mind-wandering, we must consider how “task-unrelated” is defined in the scientific literature. Laboratory studies define mind-wandering as thought that is unrelated to the experimental task (e.g., Christoff, Gordon, Smallwood, Smith, & Schooler, 2009). So far, so good: thoughts about personal goals such as making dinner are unrelated to the experimental task, and so correctly count as mind-wandering.

In studies of “real-world” mind-wandering outside the lab, however, “tasks” are operationally defined as *whatever the person is currently doing*. For example, participants are asked whether “my mind had wandered to something *other than what I was doing*” (Kane et al., 2007, p. 616, emphasis added), or “are you thinking about something other than *what you’re currently doing?*” (Killingsworth & Gilbert, 2010, p. 932, emphasis added).

Here is the problem. *What you are doing* often includes working toward the personal goals to which your mind wanders. For example, if we ask you, “what are you doing?” it would be natural for you to answer, “planning dinner” or “preparing for a test.” Therefore, rather than supposing that mind-wandering is task-unrelated thought, we could argue that individuals switch tasks when their minds begin to wander. According to this view, when the programmer’s mind wanders to computer code on the commute home,

her task switches to coding from watching for her subway stop. Relative to the new task of coding, her thoughts about code count as task-related.

We can now bring the dilemma into full view. On the one hand, if we say that any and all stimulus-independent thought is mind-wandering, then we muddy the distinction between mind-wandering and goal-directed thinking. On the other hand, if we try to hold onto this distinction by supposing that mind-wandering must be task-unrelated thinking, then we contradict the empirical evidence that shows that task-related mind-wandering is not only possible but frequently actual.

Our diagnosis of the dilemma highlights the dynamics of mind-wandering. The distinction between mind-wandering versus goal-directed thinking does not concern whether *mental states* are task-unrelated or stimulus-independent. Rather, the distinction concerns how *trains of thought unfold over time*. When a mathematician solves a problem in her head, she maintains her attention on this problem for a prolonged period of time. In contrast, wandering thoughts “move hither and thither,” drifting between topics unchecked. Because current definitions of mind-wandering abstract away from its dynamics, they cannot distinguish mind-wandering from either rumination or goal-directed thinking. We now propose a theory that overcomes these limitations: mind-wandering is unguided thinking (Irving, 2016).

Mind-Wandering Is Unguided Thinking

We define mind-wandering as unguided thinking. This definition depends on a particular concept of *guidance* taken from the philosophy of action. Thought or behavior is said to be guided when it is monitored and regulated as it unfolds over time (Pacherie, 2008; Railton, 2006). Harry Frankfurt provides a classic philosophical explanation of guidance:

Behaviour is purposive when its course is subject to adjustments which compensate for the effects of forces which would otherwise interfere with the course of the behavior. . . . This is merely another way of saying that their course is guided. (Frankfurt, 1978, pp. 159–160)

According to this account, “guidance” includes as part of its meaning a counterfactual aspect. To say that behavior is guided implies the following: Were it to go off course or deviate from some standard—as a result, for example, of interfering forces—one would alter it in order to bring it back on course. In other words, as Frankfurt states, guidance implies adjusting behavior to compensate for deviations. Thus the concept of guidance also includes a normative aspect: It implies the monitoring and correcting of behavior in relation to some norm or standard. For example, consider conversational interaction. In a conversation, you are guided to maintain a certain distance from your partner, for were your partner to stand too close to you, you would feel discomfited and drawn to step back (Brownstein & Madva, 2012). In other words, your behavior is guided in the sense that it compensates for deviations from the (culturally specific) standards or norms of conversation. It follows that for behavior to be guided, there must be regulatory processes for bringing “deviant” behavior back on track.

We use this technical concept of guidance in order to specify what it means for thought to be guided. We propose that one’s thinking is guided only if one would feel pulled back to its topic, were one distracted from it. We also suppose that thinking can be guided in a variety of ways. Our thoughts can be guided back to goal-relevant information, as happens when we are goal-directed, or guided back to affectively salient information, as happens when we ruminate. Although different neurocognitive processes

may underlie these two kinds of thinking, we argue that both kinds implement guidance in our technical sense.

Consider goal-directed thinking. In goal-directed thinking, one would feel pulled back to pursuing the goal were one to focus on information that seems irrelevant to it. Imagine a mathematician intently constructing a proof in a busy library. Her attentiveness manifests partly in how her attention is guided back from distractors. Were she to become momentarily distracted by students shuffling their papers, she would likely feel frustrated and pulled back to her work. Thus her mental activity is guided in its being regulated in relation to her goal.

We hypothesize that rumination also is guided. We predict that individuals who break away from their ruminative thoughts will feel pulled or drawn back to them. For thinking to be pulled or drawn back to a particular focus in this way is precisely for it to be counterfactually regulated and thus guided.

<Place Table 8.1 about here.>

Our hypothesis that rumination is guided does not entail that it has the same psychological and neural profile as goal-directed attention (Table 8.1). On the contrary, as mentioned earlier, the genus “guided thought” allows for different species of guided thinking that are subserved by different brain processes. For example, top-down cognitive control processes appear to be largely responsible for the guidance of goal-directed thought (e.g., Corbetta & Shulman, 2002; Kane & Engle, 2002), whereas affective biases of attention and memory (Todd, Cunningham, Anderson, & Thompson, 2012) likely play a strong role in one’s being guided toward ruminative thoughts. Furthermore, goal-directed attention is paradigmatically voluntary, whereas rumination typically is

involuntary. The ruminator might complain, “I don’t want to think about distressing thoughts; they just keep pulling me back in.” Nevertheless, we propose that rumination and goal-directed attention are both guided in our technical sense: in either case, if individuals were mentally distracted from their current focus, they would feel their thoughts pulled back to it.

That goal-directed thought and rumination are both guided explains why both kinds of thinking are dynamically stable. Our thoughts remain fixed on a restricted set of information because they are guided to remain there.

In contrast, we define mind-wandering as unguided thinking (Irving, 2016). Whereas a guided thinker would feel pulled back if she were distracted from her current focus, an unguided thinker wanders from one topic (dinner) to another (computer code); her mind drifts unchecked, with nothing to pull her back to a particular focus.

This lack of guidance explains why mind-wandering has an itinerant or unstable dynamics rather than a stable dynamics. Thoughts drift from topic to topic because nothing holds them in place. Thus our definition captures the dynamics of mind-wandering. Moreover, we provide a principled way to distinguish between different varieties of task-unrelated and stimulus-independent thought: in rumination, thoughts are guided to remain on the same topic and hence exhibit greater dynamical stability, whereas in mind-wandering, thoughts are unguided and hence exhibit greater dynamical instability.

Our account avoids the earlier-mentioned dilemma arising from the possibility of task-related mind-wandering. Recall that both wandering thoughts and goal-directed thoughts can be related to everyday tasks, such as planning dinner or writing computer

code. Because of this possibility, current definitions of mind-wandering cannot properly distinguish it from goal-directed thinking. According to our account, the difference between them concerns how trains of thought are guided as they unfold over time. Goal-directed thinking is guided to remain on the same topic (e.g., writing code). Mind-wandering is unguided, so it is free to drift from one topic to the next. Its dynamics are unguided even when one's mind wanders to a personal goal (such as writing computer code). The crucial point is that if one's thoughts were to drift onward (e.g., to a joke one heard today), one would not be drawn back to a particular focus.¹

Our definition of mind-wandering as unguided thinking overcomes the limitations of previous definitions in the empirical literature. Our definition is based on an account wherein stretches of mind-wandering consist of trains of thought whose dynamics are unguided. This account, however, is not the only account of mind-wandering in the philosophical literature. We will now review two other accounts and critically assess them in relation to our own.

Mind-Wandering as Thought Lacking “Veto Control”

Thomas Metzinger (2013; see also Metzinger, Chapter 9 in this volume) proposes a theory of mind-wandering that helps to explain the relationship between mind-wandering and cases of goal-directed thinking, such as a mathematician constructing a proof.²

Metzinger allows that mind-wandering can be goal-directed, and so his theory can accommodate the evidence that our minds frequently wander to our personal goals.

Nevertheless, he maintains that mind-wandering differs from fully “autonomous” forms of goal-directed thinking, such as a mathematician consciously constructing a proof. In

Metzinger's view, goal-directed thinking is "mentally autonomous" only if one has the kind of cognitive control over one's thoughts that he calls "veto control."

The concept of "veto control" comes from cognitive science. It refers to the person's ability to "withhold a . . . [behavior]³ whose preparation and path towards execution has already begun" (Filevich, Kühn, & Haggard, 2012, p. 1108). Consider the following example in which you exercise veto control:

You are posting a letter, and are just about to release your grip on it and let it fall into the post box, when you suddenly get the feeling that you should check whether you put a stamp on the envelope. You tighten your grip and inspect the letter. (Filevich et al., 2012, p. 1108)

Note that you would have possessed veto control even if you had released the letter, because veto control requires only that you are able—and know that you are able—to suspend the relevant behavior (Metzinger, 2013, p. 4).

Metzinger argues that when our minds wander, we lack veto control over our thoughts. Thus he distinguishes mind-wandering from autonomous goal-directed thinking that we can suspend at will—for example, consciously constructing a math proof. In support of this view, Metzinger appeals to evidence that mind-wandering unfolds without meta-awareness (Schooler et al., 2011).⁴ "Meta-awareness" is defined as one's explicit knowledge of the current contents of thought or one's current conscious state (Schooler, Smallwood, Christoff, Handy, Reichle, & Sayette, 2011). Thus meta-aware mental states are higher-order mental states that are about one's ongoing or just past mental states. One example is a lucid dreamer's meta-awareness that she is dreaming (see Windt and Voss,

Chapter 29 in this volume). Another example is the sudden realization that your mind was wandering.

Metzinger's argument has two premises. First, meta-awareness is necessary for veto control over a mental state or process (Metzinger, 2013, p. 3): A person cannot knowingly terminate something of which she is unaware. (Suppose I discover that you were not paying attention and I ask, "Why didn't you stop your mind from wandering earlier?" You might reasonably respond, "I didn't know my mind was wandering until just now.") Second, Metzinger contends that whenever a person's mind is wandering, she lacks meta-awareness of her wandering thoughts. From these two premises, it follows that people lack veto control over their wandering thoughts. Thus, Metzinger's account suggests that mind-wandering can be defined as thinking that lacks meta-awareness and veto control.

The problem with this account is that the second premise—that mind-wandering always occurs without meta-awareness—is questionable. The evidence suggests that although mind-wandering sometimes occurs without meta-awareness, this is not always the case (Christoff et al., 2009; Schooler, Smallwood, Christoff, Handy, Reichle, & Sayette, 2011; Smallwood & Schooler, 2006). Many studies of mind-wandering use self-reports to assess meta-awareness. Individuals who catch themselves mind-wandering or who report that their minds were wandering upon being probed are asked whether they were previously aware of their mind-wandering. For example, Smallwood and colleagues gave participants the following instructions in order to distinguish between aware ("tuning out") versus unaware ("zoning out") mind-wandering:

Tuning Out: Sometimes when your mind wanders, you are aware that your mind has drifted, but for whatever reason you still continue to read. This is what we refer to as “tuning out”—i.e., when your mind wanders and you know it all along.

Zoning Out: Other times when your mind wanders, you don’t realize that your thoughts have drifted away from the text until you catch yourself.

This is what we refer to as “zoning out”—i.e., when your mind wanders, but you don’t realize this until you catch it. (Smallwood, McSpadden, & Schooler, 2007, p. 533)

Across all conditions, Smallwood and colleagues found that tuning out occurred as frequently or more frequently than zoning out. Therefore, it may be that mind-wandering occurs at least as often with meta-awareness as without it (cf. Smallwood et al., 2004; Smallwood, Beach, Schooler, & Handy, 2008).

Metzinger argues that cases of apparently autonomous mind-wandering involve the mere “illusion of control” (Metzinger 2013; cf. Schooler et al. 2011), so he might question the reliability of reports of “tuning out” (mind-wandering with awareness). Nevertheless, tuning out and zoning out have different behavioral and neural profiles (Schooler et al. 2011). For example, compared to tuning out, zoning out is associated with better reading comprehension (Smallwood et al. 2008) and more activation of default network and executive regions (Christoff et al. 2009) that are generally associated with mind-wandering (Fox et al. 2015). It is not clear how to explain these differences, if reports of tuning out are entirely illusory.

Another limitation of Metzinger's theory is that it neglects the dynamics of mind-wandering. Veto control and the presence versus absence of meta-awareness have no essential connection to how one's thoughts unfold over time, according to his account. Therefore, his account cannot distinguish mind-wandering from rumination. Ruminators often seem to lack meta-awareness and hence veto control over their thoughts. For example, a commuter might fixate on her problems and distress without realizing that she has stopped watching for her subway stop. Because she is unaware that she has begun to ruminate, she cannot disengage from (veto) her distress and bring herself back on task. Indeed, trait ruminators show impaired disengagement across a range of tasks (Whitmer & Gotlib, 2013). This finding suggests that rumination frequently unfolds without veto control. Metzinger's theory does not have the resources to explain how mind-wandering differs from this antithetical phenomenon of rumination.

Our account of mind-wandering as unguided thinking therefore has two advantages over Metzinger's account (Irving, 2016, pp. 567–568). First, we allow that mind-wandering can unfold with or without meta-awareness. During cases of tuning out—"when your mind wanders and you know it all along" (Smallwood et al., 2007, p. 533)—we propose that you have meta-awareness of and thus veto control over your stream of unguided thoughts. Second, our account captures the dynamics of mind-wandering. Accordingly, we can explain how rumination and mind-wandering differ: Whereas the former is guided, the latter is not.

Mind-Wandering as Disunified Thinking

Peter Carruthers (2015) and Fabian Dorsch (2015) independently have proposed accounts of mind-wandering that rival the explanatory power of our own account. We focus on

Carruthers's theory, but our critical discussion applies to both philosophers. Carruthers discusses mind-wandering because it provides an apparent counterexample to his view that all thinking is active and goal-directed. He concedes that mind-wandering does "not seem, introspectively, to be active in nature. Sometimes one's thoughts change direction for no apparent reason (especially when one's mind is wandering)" (Carruthers, 2015, p. 166). Therefore, he must explain away the apparent difference between mind-wandering and goal-directed thought.

Carruthers explains away this apparent difference by drawing an analogy between mind-wandering and wandering around a garden: "Mind wandering is active, I suggest, in much the same sense that someone physically wandering around in a garden is active" (Carruthers, 2015, pp. 167–168). Dorsch (2015) draws a similar analogy between mind-wandering and physically wandering around a city. Both philosophers maintain that short stretches of physical and mental wandering are active. As you wander around a garden you might actively smell a rose or wish upon a dandelion. Similarly, you might actively plan dinner or write code while your mind wanders. Nevertheless, longer stretches of physical and mental wandering seem passive because no overarching goal unifies your thoughts. Given this point, Carruthers and Dorsch can explain away the apparent difference between mind-wandering and paradigm cases of goal-directed thought, such as a mathematician solving a proof in her head. Whereas the mathematician's thoughts are all unified under a single goal (solving the proof), the mind-wanderer's thoughts concern many goals (planning dinner, writing code, and so on). Thus mind-wandering seems more passive than goal-directed thought, though both are active when we look at them closely enough.

Carruthers's and Dorsch's discussions suggest that mind-wandering be defined as disunified thinking. A sequence of thoughts constitutes mind-wandering if and only if those thoughts are not unified under a common goal. This definition has major advantages. First, it captures the dynamics of mind-wandering: by definition, our wandering thoughts are dynamically unstable in the sense that they are not unified under a common goal. Second, this definition can account for the puzzling relationship between mind-wandering and goal-directed thought. On the one hand, short stretches of mind-wandering are related to tasks (such as preparing for a quiz), as the empirical evidence suggests. On the other hand, mind-wandering contrasts with goal-directed thinking because it is disunified.

Despite the advantages of this conception of mind-wandering, it has a problematic consequence, which we can bring out in the following example. Imagine someone who works for 10 minutes composing part of a lecture, then opens his web browser and responds to some emails for 6 minutes, and then looks outside the window, studying the pigeons across the street for 90 seconds. Furthermore, suppose that the person attentively pursues each goal. Nevertheless, no overarching goal unifies this whole sequence of thoughts, so they count as mind-wandering. Shifting from goal to goal in this way seems commonplace. Therefore, if we define mind-wandering as disunified thinking, most trains of goal-directed thinking will count as mind-wandering. But then it seems that Carruthers and Dorsch have not captured the difference between mind-wandering and goal-directed thinking at all.

A deeper problem lurks in the vicinity. Whether thinking counts as disunified, and thus as mind-wandering, depends on the scale of observation or how far we zoom out

(Figure 8.1). Suppose we examine the person's thoughts in the previous example. In the first five minutes, his attention is wholly guided by the goal of composing the lecture. During that interval, his attention is unified and his mind is not wandering. But if we zoom out to a seventeen-minute interval, we find thoughts about three separate goals—composing a lecture, writing emails, and watching pigeons. From this broader perspective, his attention is disunified and his mind is wandering. The problem is that we lack principled reasons for deciding how far to zoom out, and therefore we lack principled reasons for saying whether his mind is wandering at any given point in time.

<Place Figure 8.1 about here>

This consequence undermines the scientific methods we use to study mind-wandering. These methods require that we be able to specify when the mind is wandering versus when it is not, so that we can study the distinctive features of wandering thoughts (such as their contents and their neural correlates) versus other kinds of thoughts. For example, Christoff et al. (2009) compared neural activation when individuals were concentrating on a task versus mentally wandering away from it. If we define mind-wandering as disunified thinking, then we cannot use these methods, because if we zoom out, then the on-task thoughts are probably going to count as wandering thoughts. No methodological innovation could solve this problem. In other words, given the definition of mind-wandering as disunified thinking, there will be no principled way to distinguish mind-wandering from goal-directed thought. Therefore, this definition is a non-starter for the cognitive science of mind-wandering.

In contrast, our definition of mind-wandering as unguided thought does not face these problems. We provide a principled way to distinguish goal-directed and wandering

thought: The former is guided; the latter is not. Therefore, our definition is preferable on conceptual grounds as well as being more amenable to empirical investigation.

Conclusion

Psychologists, cognitive neuroscientists, and philosophers should be partners in the scientific investigation of mind-wandering. The challenges facing this young field are not only empirical, but also conceptual and theoretical. Our chapter begins with a philosophical critique of the most widely accepted definitions of mind-wandering in cognitive psychology. This critique stems from the idea that mind-wandering is fundamentally dynamic. Our definition uses the technical philosophical notion of “guidance” to capture its dynamics. Compared to the other extant philosophical definitions, our definition of mind-wandering as unguided thought is not only more theoretically defensible, but also more scientifically tractable. Putting this definition to work in cognitive science will require close collaborations with psychologists and cognitive neuroscientists. For example, difficult questions remain about how to measure the dynamics of mind-wandering (Christoff, 2012) and how to relate the philosophical notion of guidance to dynamical neural networks and psychological processes (Christoff, Irving, Fox, Spreng, & Andrews-Hanna, 2016). The path forward requires that psychologists, cognitive neuroscientists, and philosophers work together to advance our understanding of mind-wandering.

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Figure 8.1.

Disunity and zoom.

Table 8.1

Varieties of Guided Thinking

	Goal-Directed Thinking	Rumination
Guided toward	Goal-relevant information	Distress, etc.
Implemented thought	Cognitive control	Affective biases
Voluntary	Yes	Often not
Guided	Yes	Yes
Dynamically stable	Yes	Yes

Notes

¹ One might worry that our view characterizes mind-wandering as *too disordered*.

Although mind-wandering is certainly *less* stable than goal-directed or ruminative thought, our wandering thoughts are not entirely random: for example, our minds often wander to personal goals and concerns (as noted earlier) and between associated thoughts. For similar reasons, we elsewhere propose a neuroscientific model on which the dynamics of mind-wandering are somewhat constrained, albeit less so than goal-directed or ruminative thoughts (Christoff, Irving, et al., 2016). Fortunately, our philosophical model of mind-wandering is compatible with the presence of dynamic constraints on mind-wandering. This is because guidance is not the only way that thought can be constrained. Mind-wandering

can be *probabilistically* constrained, in that we *often* think of particular things (e.g., close associations, personal goals and concerns). Yet we contend that when the mind wanders, no guidance mechanism holds our thoughts in place; when the mind wanders to unusual ideas, or from one topic to another, nothing pulls us back. See Irving (2016) for an in-depth discussion of the different types of constraints on thought, including those that are present and absent during mind-wandering.

² Much of the material for this section is adapted from Irving (2016).

³ Filevich and colleagues originally defined “veto control” as the ability to “withhold an action.” We have changed the definition, replacing “action” with “behavior,” because veto control arguably is necessary for action (as opposed to mere movement). In that case, defining “veto control” as the ability to withhold an action would trivially imply that one never lacks veto control.

⁴ Thus Metzinger expands upon Smallwood and Schooler’s (2006) thesis that mind-wandering differs from goal-directed thought because the former always begins without meta-awareness.