



## MIND WANDERING CAN BE A GOOD THING

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### YOUNG REVIEWERS:



KARTHIK

AGE: 15



KAYO

AGE: 10

Staying focused is important for nearly every human activity, yet we often struggle to do it. When we are unable to focus our thoughts, we say that we are mind wandering. Mind wandering is very common and occurs in every healthy mind. In fact, mind wandering may even reflect the regular way of thinking, unless people make special efforts to prevent it. But is all mind wandering the same? Why does the mind wander, and when? What effect does mind wandering have in our lives? In answering these questions, we will show how mind wandering can even be helpful for things like creativity and learning.

### MIND WANDERING AND ITS CONSEQUENCES

Any student knows that it can be hard to keep attention focused. For instance, when you are supposed to be listening to your teacher, you may find your mind drifting away. You might look out the window, make plans for after school, or think about nothing at all! Sadly, if students let their attention drift too far or for too long,

## SUSTAINED ATTENTION

The ability to focus attention while ignoring distractions, over time.

## MIND WANDERING

Thinking about anything other than the task you should be focusing on.

### Figure 1

Mind wandering can occur anytime, anywhere—it is a normal part of the way the brain works. Photo by Vanessa Bumbeers on Unsplash.

they may miss what the teacher is saying—much to the dismay of teachers everywhere!

This experience is very interesting to scientists, many of whom also struggled to focus in school. **Sustained attention** is the term used to describe the ability to keep focused on whatever activities we are trying to do. We know that sustained attention is very important for many different things—like learning and remembering. We also know that sustained attention often fails and attention shifts to unrelated thoughts—this is called **mind wandering** [1]. Mind wandering is surprisingly common. Some studies find that people may spend nearly half their day mind wandering.

The effects of mind wandering can vary a lot. Sometimes there are no effects at all (Figure 1). Think about drinking a glass of water: this task is simple and happens often, allowing you to drink without much effort or spilling, even if your mind is wandering. This kind of behavior is automatic.



Figure 1

Other times, mind wandering has minor effects. If you briefly lose focus on your teacher's voice, you may not hear what was said; but by rapidly focusing on the teacher's voice again, you can get back on track fairly easily. Finally, there are instances when mind wandering can have very serious results. Imagine crossing the street or riding a bike without focusing on your surroundings.

Because mind wandering is such a common and normal part of daily life, scientists have asked two major questions about it. First, is mind wandering one thing, or are there different kinds? Second, why does mind wandering happen at all?

## QUESTION #1: IS ALL MIND WANDERING THE SAME?

Many studies have tried to discover whether there are different kinds of mind wandering. These studies show that people can lose focus in different ways. Mind wandering can happen on purpose or by accident. Attention can also focus inward (on your thoughts) or outward (on the world around you). Finally, people can lose focus just a little (shallow) or a lot (deep). Do not worry if those sound complicated—we will discuss each one.

The first big difference is whether mind wandering is on purpose or not. Most mind wandering appears to happen on its own, or by accident [2]. For instance, a surprising sound may capture your attention. Other times, you may just lose focus and have no idea why. That said, mind wandering can also happen on purpose. Consider waiting at a doctor's office, when you must maintain enough awareness to hear your name being called. At the same time, you will probably allow other thoughts to run through your mind. This "on-purpose" kind of mind wandering is common when doing something easy, or when you do not feel motivated.

Another way of understanding mind wandering is to consider *what you are thinking about* when you lose focus. This is the difference between internal and external mind wandering [3]. Perhaps while waiting at the doctor's office, you start looking out the window to watch people walking by—this focuses on your senses and the world around you and is called **external mind wandering**. The opposite would be if you focused on your inner thoughts—maybe remembering your last doctor's visit or planning for what you will do later in the day—and this is called **internal mind wandering**.

Finally, mind wandering can differ based on how deep vs. shallow it is. One idea [4] is that there are three levels of mind wandering. The deeper your level of mind wandering, the less connected you are to the world around you. Think of mind wandering as a slinky bouncing down stairs. Unless something stops it, the mind will keep going from shallow mind wandering (the top steps) into the deeper kinds (bottom steps).

The first, most shallow step in mind wandering involves very short and shallow dips in your attention to detail. This is relatively common, like briefly zoning out during class. The effects, however, are usually small. People will usually notice they are mind wandering and choose to refocus their attention.

If attention is *not* refocused, it is likely that mind wandering will progress to the second, medium, level. This involves longer-lasting lapses in attention, which you are less likely to notice. When mind wandering at this medium depth, you can still go through the motions of activities that are familiar to you, like brushing your teeth or eating a

### EXTERNAL MIND WANDERING

Focusing attention on the world around you, through your senses (sight, sound, and more).

### INTERNAL MIND WANDERING

Focusing attention on your inner thoughts, such as recalling memories or planning for the future.

## MIND BLANKING

When the mind is not active, and attention is not focused on any particular thoughts.

### Figure 2

Mind wandering can be dangerous, depending on the activity you are participating in. For example, failure to maintain focus while biking could lead to a crash. Shallow mind wandering is less risky (you can likely refocus) but deeper mind wandering is far more dangerous. Photo by William Hook on Unsplash.



Figure 2

In sum, different kinds of mind wandering exist. Despite these differences in the types of mind wandering, a common finding is that people struggle with whatever they are doing when the mind wanders [5].

## QUESTION #2: WHY DOES MIND WANDERING HAPPEN?

Much evidence suggests that mind wandering is *not* a rare mistake, but actually a very *normal* part of the way the mind works! In other words, the mind will naturally wander unless it is given a specific job [2, 6]. In fact, we now know that attention-related disorders like **ADHD** can be understood as a normal behavior (mind wandering) that is simply happening in an unusually high amount. This knowledge makes it easier to study how much mind wandering is normal and how mind wandering can impact other parts of life, such as emotions and learning [7].

## ADHD

Attention Deficit Hyperactivity Disorder; a mental health disorder involving many instances of mind wandering.

So why do we mind wander in the first place? The likely reason is that mind wandering serves useful purposes. For instance, mind wandering can help in problem solving, creative thinking, and planning for the future [8]. Even when you are not trying to think about anything, your mind is still working in the background. Without trying, your mind might start focusing on memories that could help solve a problem in the present. This can be when creative or unusual ideas are made! For instance, a musician might combine different melodies to make something new.

Also, mind wandering can help with learning and memory—specifically for things that are not relevant to the task at hand [5, 8]. People who mind wander more show greater learning for this irrelevant information, and the learning is best *during* periods of mind wandering [9]. After learning, mind wandering helps strengthen recent memories. This benefit is strongest when the memories are relevant to you personally.

Finally, mind wandering offers a time to “rest” and prepare for upcoming thinking [8, 10]. It prevents new information from entering the mind and using up limited attention in processing that new information. When our minds wander, we can then process older information in new ways. Creative ideas can be built and used to plan or solve problems. When our minds wander, our attention can also focus on sources of information that are potentially useful, like thinking about plans for later in the day, for example. When that information is useful, it can be processed and remembered.

## R-E-L-A-X

The mind actually does a lot when it wanders! So, do not see mind wandering as a mistake. Try to remember how mind wandering redirects your focus. This allows you to learn new things and to process information better. There are times when you *should* try to focus your attention, like when riding a bike. However, always remember that taking a mental break is healthy. There are many wonderful things in the world that you can notice when you let your mind wander. So, let yourself gaze out the window or stare at clouds, or even close your eyes and simply “be”.

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## YOUNG REVIEWERS



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Karthik is a sophomore in high school who is passionate about neuroscience and psychology. He has completed research examining the effects of light on circadian rhythms in the past and has a manuscript under review at a peer-reviewed high school journal.



### **KAYO, AGE: 10**

I like doing science experiments, especially when there is color change and fire involved.

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Michael Dubois is a Ph.D. candidate in the LAND lab under Amy's supervision, with research focusing on fluctuations in sustained attention. He tests what consequences lapses in attention have for different kinds of learning, in particular, what benefits for learning may arise. In addition, Michael has a longstanding passion for university teaching—including psychology, research methods, and science history. Recently, Michael accepted a position as a research analyst in the public education sector. Above all, he is a husband and father of three. \*[m.dubois@mail.utoronto.ca](mailto:m.dubois@mail.utoronto.ca)



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Dr. Amy Finn is an Associate Professor in Psychology and director of the Learning and Neural Development Lab at the University of Toronto. Her research explores how the developing brain influences learning, either facilitating gains in learning or constraining them. She is best known for her work exploring "developmental reversals" or instances in which children do and learn better than adults. Her lab combines interdisciplinary tools and perspectives from development, cognitive neuroscience, language-learning, memory, and attention fields, to uncover developmental shifts on how information is attended, processed and remembered.