

Why Boredom Is Interesting

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Abstract

Is boredom bad? It is certainly common: Most everybody gets bored. There is a sense that boredom sometimes causes bad things to happen (e.g., substance use, self-harm) and sometimes causes good things to happen (e.g., daydreaming, creativity), but it is hard to understand what boredom does without first understanding what it is. According to the meaning-and-attentional-components (MAC) model of boredom and cognitive engagement, the emotion of boredom signals deficits in attention and meaning. Much like pain, it may not be pleasant, but boredom critically alerts us that we are unable or unwilling to successfully engage attention in meaningful activities. Whether that is good or bad rests ultimately on how we respond.

Keywords

boredom, meaning, attention, motivation, emotion

When a Russian man stole an army tank and drove it into a local supermarket (Kiryukhinia & Coleman, 2018), you would have been forgiven for thinking he had good reason. Nope, reported journalists: He was just bored.

Tales of bored troublemakers abound. From the odd—bored shopworkers cremating a mouse (“‘Bored’ Workers ‘Cremated Mouse,’” 2019)—to the disturbing—an Irishman caught aiming his pellet gun at drivers (Ferguson & McLean, 2019)—these news stories appear regularly, and the explanation “I was bored” resonates and perplexes. What is it about boredom that drives people to steal military equipment, watch movies on the job, and lay mice to rest? Is boredom really that nefarious?

It is certainly common: Most everybody gets bored (e.g., Chin, Markey, Bhargava, Kassam, & Loewenstein, 2017). Boredom is especially common at work, where it is linked to productivity loss and burnout (Fisher, 1993). It is also common in schools: Students get bored, and bored students do not do very well (Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010). Indeed, there is growing suspicion that boredom lies behind many socially destructive behaviors, including self-harm, compulsive gambling, and substance use (Mercer & Eastwood, 2010; Weybright, Caldwell, Ram, Smith, & Wegner, 2015). Yet, at the same time, there are calls from public intellectuals for people to experience more boredom in the belief that it leads to greater well-being (Paul, 2019). Who is right? To understand when boredom is good (and when it is bad), we first need to understand what boredom is.

Attention and Meaning: Boredom’s Key Ingredients

If you are reading this, you have almost certainly had the lamentable experience of reading a boring article. We all know the feeling: Dread and irritation build, your mind wanders, you check the clock and remaining page count, or even surrender and sneak a glimpse at your phone. In short, you are bored. But why?

There could be something amiss with the environment—too much constraint or too little stimulation or arousal (Berlyne, 1960). According to attentional theories, such environmental features foster understimulation that makes it difficult to focus (Csikszentmihalyi, 2000; Eastwood, Frischen, Fenske, & Smilek, 2012). There is excellent evidence that difficulty paying attention translates into feelings of boredom and that understimulation can cause inattention. But such theories do not account for times when inattention is the result of overstimulation—too much going on rather than too little—and overlook a greater problem: Sometimes attention is not the issue.

Many functional approaches to boredom set attention aside to consider its underlying purpose; their proponents argue that boredom is a signal meant to alert people to

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underlying problems, most often concerning goals, meaning, or opportunity costs (e.g., van Tilburg & Igou, 2012). If inattention results in boredom, such individuals argue, it is because inattention is an indirect signal that what you are doing lacks value or meaning. But that does not explain instances when people are bored during otherwise meaningful activities.

Which is it then? Is boredom caused by inattention resulting from understimulation? Or is boredom caused by a lack of meaning? Both are (partially) right.¹ The meaning-and-attentional-components (MAC) model of boredom and cognitive engagement unifies past work that has examined attention, meaning, and their environmental correlates in isolation and brings these ideas together to explain what boredom is and why we experience it.

The MAC Model of Boredom

Like all emotions, boredom conveys information (Clore, Gasper, & Garvin, 2001). Just as anger tells us when someone has violated important boundaries, boredom alerts us when we are not able to pay attention or find meaning in what we are doing. Boredom's underlying message? There is no value in continuing the current course of action, at least "as is." Boredom comes in many variants, from low arousal to high, from fatigue to agitation. Although some theories have defined boredom as a low-arousal state, boredom is just as often associated with high as with low physiological arousal (e.g., Chin et al., 2017; Merrifield & Danckert, 2014). Instead, what matters in defining boredom, as with all emotions, are its causes. Just as diseases are defined not by their outward symptoms (e.g., fever, cough), which may be shared by many illnesses, but rather by the unique pathogens that cause them (e.g., influenza virus), so, too, are emotions defined by their unique inputs rather than their outputs (Barrett, 2006).

According to the MAC model, boredom is an affective indicator of unsuccessful attentional engagement in valued goal-congruent activities (Westgate & Wilson, 2018). Put simply: We get bored when we are not able to pay attention or cannot find meaning in what we are doing. How do people successfully pay attention? The answer comes from aligning cognitive demands with cognitive resources, which can happen in one of two ways: Both can be low, as in low-level engagement, which results in feelings of enjoyment (e.g., a tired commuter playing Candy Crush), or both can be high, as in high-level engagement, which results in feelings of interest (e.g., a caffeinated scientist reading a groundbreaking new article). Attentional difficulties can result from both underchallenge and overchallenge: People can be bored when something is too hard or too easy, because both make it difficult to sustain attention (Westgate, Wilson, & Gilbert, 2017). Likewise, meaning

deficits occur when what we are doing does not match up with currently active relevant goals. It feels subjectively meaningless and, thus, boring (regardless of how-ever objectively meaningful it may be).

In other words, it is not enough to be able to pay attention, and it is not enough to find meaning. Both are necessary; a deficit in either one is sufficient to cause boredom. Attention and meaning act as independent predictors of boredom, do not interact or depend on each other, and are not themselves highly related according to correlational evidence from more than 14 studies and more than 1,000 participants (see Fig. 1; Westgate & Wilson, 2018). The same is true when attention and meaning are manipulated experimentally: Inducing meaning deficits by offering (or withholding) charitable contributions makes the same mundane task feel more (or less) meaningful—and doing so results in boredom. Likewise, inducing attention deficits by experimentally manipulating cognitive demands creates underchallenge and overchallenge—and again, doing so results in boredom (see Fig. 2; Westgate & Wilson, 2018). These ways in which attention and meaning combine to produce boredom, versus enjoyment or interest, are shown in Figure 3.

This assumption—that people must have both the capacity to act and the desire to do so—underpins many psychological theories, for example, persuasion (Petty & Cacioppo, 1986), suicide (Van Orden et al., 2010), and controlled versus automatic processing (Olson & Fazio, 2008). Even flight attendants routinely ask passengers seated in exit rows of the aircraft whether they are "willing and able" to assist in the event of an emergency (Exit Seating, 2017). This makes boredom a special case of a broader ability-motivation framework that applies to psychology more generally, a kind of psychological "exit row," where people's thoughts, feelings, and behavior are determined by their perceptions (or "construals") of what they are willing and able to do.

Different Causes, Different Consequences

Attention and meaning deficits not only both cause boredom, but they also cause different experiences of boredom. *Attentional boredom*, caused by attention deficits, is often characterized by difficulty concentrating, mind wandering, and inattention. *Meaningless boredom*, on the other hand, is caused by meaning deficits and is often characterized by high arousal, feelings of sadness and loneliness, and distorted time perceptions—but most of all by the desire to disengage. And, of course, people can experience *mixed boredom* if both meaning and attention are missing (Westgate & Wilson, 2018).

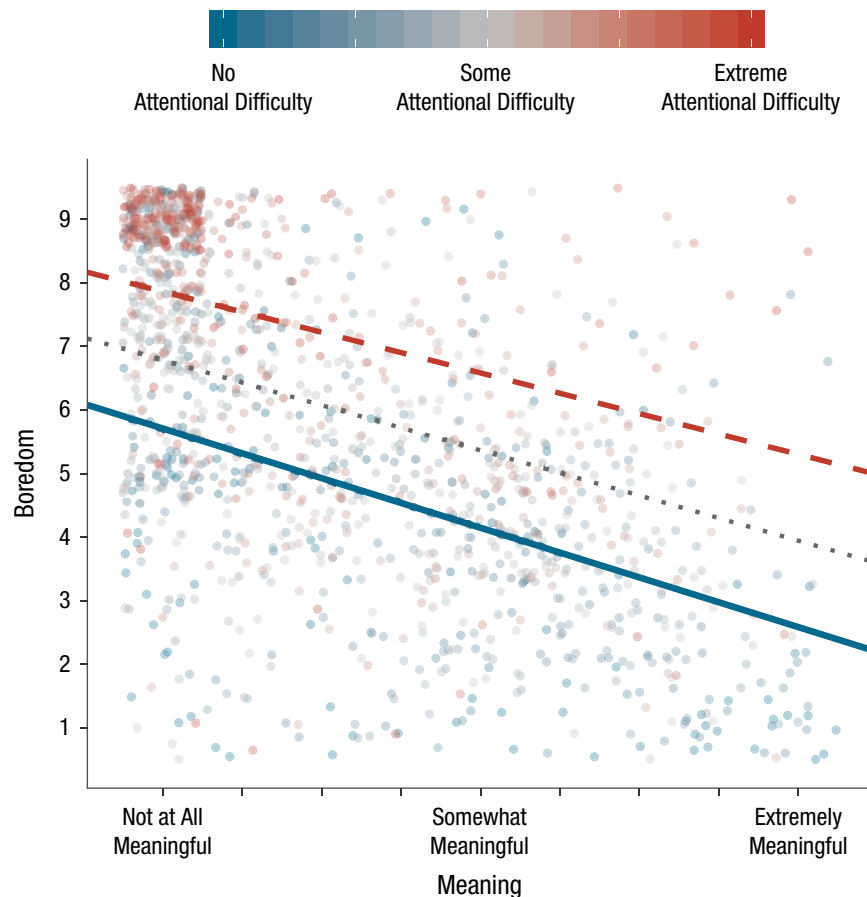


Fig. 1. Scatterplot showing how meaning and attention deficits predict boredom equally and stack when combined. Across 14 studies (online, in the lab, and in the field), 1,364 participants reported how bored they were, how much difficulty they had concentrating, and how personally meaningful it felt to complete a variety of activities, from air-traffic-control simulations to trying to think for pleasure (all ratings were made on 9-point scales; 1 = *not at all*, 5 = *somewhat*, 9 = *extremely*). People were most bored when they were not able to pay attention and did not find it meaningful and least bored when they were both able to pay attention and did find it meaningful. Similar results were found when meaning and attention were manipulated experimentally. Slopes represent the effect of meaning on boredom when attentional difficulty was low (solid blue line), moderate (dotted gray line), or extreme (dashed red line). Adapted from Westgate and Wilson (2018).

Just as attentional boredom feels different from meaningless boredom, we can distinguish between two attentional subtypes: attentional boredom resulting from underchallenge and attentional boredom resulting from overchallenge. Attentional boredom from overchallenge is characterized by feelings of agitation accompanied by frustration. Indeed, it may seem strange to label it boredom rather than frustration, but the two emotions have different causes: People feel bored when they do not have the cognitive resources to pay attention but frustrated to the extent that those attentional difficulties block a desired outcome. Thus, whereas boredom is about the process, frustration is about the outcome of that process (Westgate & Wilson, 2018).

Although these many types of boredom may feel different, people spontaneously label them all as boredom because they signal the same underlying problem: an inability to successfully engage in meaningful activity. That signal and those feelings have value.

What Boredom Does: The Four Roads to Boredom Regulation

By understanding what boredom is, we can better understand what boredom does. Boredom spawns a wide range of behaviors—some positive (e.g., prosocial intentions, daydreaming), some negative (e.g., self-induced electric shock, substance use), and some neutral (e.g., snacking).

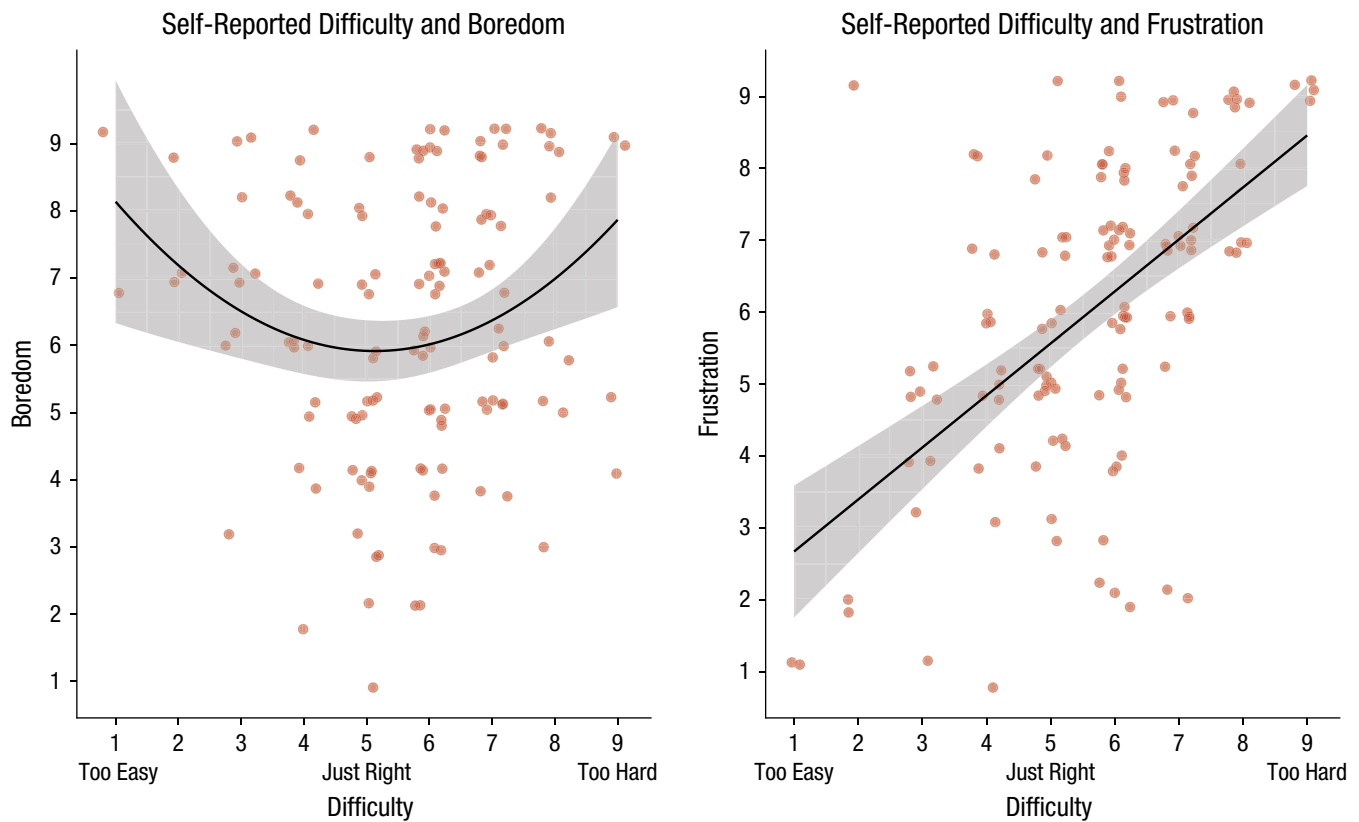


Fig. 2. Scatterplots showing the relationship between boredom and difficulty (left) and frustration and difficulty (right). Attentional boredom can occur because a task is too hard or too easy. Participants completed an ambiguously difficult version of a simulated air-traffic-control task for 10 min and reported how subjectively difficult it was for them (1 = *too easy*, 5 = *just right*, 9 = *too hard*), as well as how bored and frustrated they felt (1 = *not at all*, 5 = *somewhat*, 9 = *extremely*). People were most bored when it was too hard or too easy, because both under- and overchallenge make it hard to pay attention. In contrast, the same people felt more frustrated the harder the task was because increasing difficulty decreases the likelihood of a successful outcome. Similar results were found when difficulty was manipulated experimentally. Lines show the best-fitting curvilinear (left plot) and linear (right plot) regression parameters, and error bands show 95% confidence intervals. Adapted from Westgate and Wilson (2018).

According to the MAC model, the state of boredom provides people with information about their current attentional and meaning states—or sum value of continued cognitive engagement—which they then use to form judgments and make decisions (Baumeister, Vohs, DeWall, & Zhang, 2007). If meaning and attention deficits cause boredom, there are four primary routes to effectively alleviating boredom: (a) regulating cognitive demands, (b) regulating cognitive resources, (c) regulating goal value, and (d) switching activities. The first three routes address problems with underlying attention and meaning deficits, respectively; the final route alleviates boredom by changing activities entirely and potentially resolves attention and meaning deficits simultaneously.

Route 1: regulate cognitive demands

One simple remedy to attentional boredom is to regulate cognitive demands: in other words, making the task harder (or easier) until it is a good fit. Simple tasks can be combined into more complex ones, and almost any

task can be made harder by adding a time limit. Indeed, people spontaneously adopt time limits or other rules to add complexity to what they are doing (Sansone, Weir, Harpster, & Morgan, 1992) and increase interest, thereby reducing boredom. Video games ramp up difficulty for this reason, increasing complexity to keep pace with gamers' growing ability, and gamifying driving does the same for drivers on the road (Steinberger, Schroeter, & Watling, 2017).

Or instead of tweaking the task, people can add external attentional demands: Listening to the radio, snacking, creative mind wandering, and electric shocks are an odd assortment, but all have been found to increase cognitive load and reduce boredom (Moynihan et al., 2015; Wilson et al., 2014). In one study (Havermans, Vancleef, Kalamatianos, & Nederkoorn, 2015), more than 90% of people randomly assigned to watch an 85-s video of an indoor tennis game on repeat for an hour chose to self-administer electric shocks—an average of 22 times!

Conversely, in cases of overchallenge, one remedy is to lower demands—to make it easier. Complex tasks

		Meaning	
		Low Meaning: Task Is Incongruent With Valued Goals	High Meaning: Task Is Congruent With Valued Goals
Attention	Understimulation: Demand < Resources	Mixed State: Meaningless + Attentional Boredom: Seek Interesting Activity	Attentional Boredom: Increase Cognitive Demand
	Low-Level Engagement: Low Demand + Low Resources	Meaningless Boredom: Seek Enjoyable Activity	Enjoyment (Low Boredom)
	High-Level Engagement: High Demand + High Resources	Meaningless Boredom: Seek Interesting Activity	Interest (Low Boredom)
	Overstimulation: Demand > Resources	Mixed State: Meaningless + Attentional Boredom: Seek Enjoyable Activity	Attentional Boredom: Increase Cognitive Resources

Fig. 3. The meaning-and-attentional-components (MAC) model of boredom and cognitive engagement. Attention and meaning combine in different ways to produce different types of boredom as well as feelings of enjoyment or interest (low boredom). These different types of boredom, in turn, lead to different predictions for downstream behaviors and outcomes.

can be broken down into simpler chunks, and reducing external distractions (e.g., loud music) can aid concentration. In other words, we can make hard tasks less boring by making them easier, just as we make easy tasks less boring by making them harder.

Route 2: regulate cognitive resources

A more challenging remedy for attentional boredom is regulating cognitive resources—what we bring to the table. Short-term physiological options include caffeine and sleep, to aid attention and reduce boredom, or other substances (e.g., alcohol, marijuana), to reduce cognitive capacity. Indeed, drinking on the job is a common problem in understimulating work environments (Walsh, Rudd, Biener, & Mangione, 1993). Long-term, more adaptive approaches to increasing cognitive resources involve sustained practice and skill development: Scaffolded approaches to teaching employ this strategy by using simpler tasks to build up learners' ability to tackle bigger challenges down the road.

Route 3: regulate goal value

Regulating attention is not helpful when attention deficits are not the cause of boredom. Fixing meaningless

boredom requires adjusting activities or goals until both come into alignment, either by switching goals, reconstructing activities to better fit current goals, or increasing perceived value in cases in which goals and activities already align. Mentally reframing activities to be more meaningful, as in story-editing approaches, offers one approach (Wilson, 2011), as do utility-value interventions in education, which encourage students to consider their long-term goals and how current schoolwork contributes to them (Hulleman, Godes, Hendricks, & Harackiewicz, 2010). Introducing new goals, such as “speed-coasting” challenges, may likewise reduce boredom and risky driving on otherwise monotonous drives (Steinberger et al., 2017).

Route 4: switch activities

The previous routes tweak activities to be less boring; the final option is to switch entirely. Activity switching serves the dual purpose of fixing attention and meaning deficits simultaneously, assuming one chooses wisely. But which activities do bored people choose?

That depends on what they want to feel instead: interest or enjoyment. Though similar in many ways, interest and enjoyment are distinct: Interest requires cognitive resources to make sense of complex situations,

whereas enjoyment results from simple, familiar things that have been rewarding in the past. So something can be interesting but not enjoyable (e.g., a Holocaust documentary) or enjoyable but not interesting (e.g., mindless cell-phone games). Novelty and complexity likewise increase interest and reduce enjoyment, whereas certainty increases enjoyment and reduces interest (Silvia, 2006).

Because interest is cognitively demanding, people should most likely pursue interesting activities when they feel they have the resources to spare, as in attentional boredom resulting from underchallenge. This kind of boredom spurs novelty seeking, even when the novel options are bad ones (Bench & Lench, 2019; Kapoor, Subbian, Srivastava, & Schrater, 2015). Electric shocks, for instance, though not enjoyable, might be interesting, and bored people in understimulating environments readily shock themselves (Havermans et al., 2015; Nederkoorn, Vancleef, Wilkenhöner, Claes, & Havermans, 2016; Wilson et al., 2014). Likewise, bored police officers often turn to traffic stops when they have nothing to do (Phillips, 2016), and participants in functional MRI studies are willing to pay more to listen to music to avoid boring, repetitive landscape photos (Dal Mas & Wittmann, 2017). Interesting activities may be particularly suited to resolving meaning deficits: Mixed states involving meaningless boredom, for instance, increase people's willingness to donate to charity (van Tilburg & Igou, 2016).

In contrast, enjoyment may be more appealing when people feel they have relatively few resources, such as when they are bored because something is too hard. People may also pursue low-effort enjoyable alternatives simply because they work (temporarily) and are easily accessible. Boredom increases reward sensitivity and impulsivity (Milyavskaya, Inzlicht, Johnson, & Larson, 2019; Moynihan, Igou, & van Tilburg, 2017), which may make such enjoyable payoffs, including alcohol and marijuana use (Weybright et al., 2015), particularly alluring.

In the end, these choices matter. Seeking out enjoyable activities instead of interesting ones may ultimately lead to more boredom in the long run. The cognitive work required by interest goes into building new schemas and knowledge—exactly the things needed to make sense of (and feel interest in) complex topics. In this sense, enjoyable activities are like junk food, offering short-term satisfaction at the cost of long-term well-being. Switching to an easy, enjoyable activity (e.g., Candy Crush) instead of a more demanding but interesting one (e.g., a Holocaust documentary) alleviates boredom but does not foster the cognitive work needed to build resources and prevent boredom when encountering similar situations again in the future.

Summary

Much like pain, boredom may not be pleasant, but it serves an important function in alerting us to instances when we are not able to successfully engage in meaningful activity. Specifically, boredom provides two critical pieces of information—first, whether we are successfully engaged in our current task (attentional component) and second, whether our current task, regardless of engagement, is meaningful (meaning component).

In short, is boredom good? Or is it bad? It is neither. Boredom is a signal: It is what we do with that signal that counts. Stifling boredom may work, temporarily, to feel better, but the only lasting solution is to solve the underlying attention and meaning deficits that bored us to begin with.


Recommended Reading

- Eastwood, J. D., Frischen, A., Fenske, M. J., & Smilek, D. (2012). (See References). A comprehensive review (and alternative view) of boredom as a lack of attention.
- Elpidorou, A. (2014). The bright side of boredom. *Frontiers in Psychology*, 5, Article 1245. doi:10.3389/fpsyg.2014.01245. Argues for a functional view of boredom as beneficial from a philosophical viewpoint.
- Pekrun, R., Goetz, T., Daniels, L. M., Stupnisky, R. H., & Perry, R. P. (2010). (See References). A detailed overview of the problem of boredom in schools and education.
- van Tilburg, W. A. P., & Igou, E. R. (2012). (See References). Inaugural empirical evidence (and alternative view) of boredom as a lack of meaning.
- Westgate, E. C., & Wilson, T. D. (2018). (See References). Comprehensive review and empirical evidence for an integrative theory of boredom.

Action Editor

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Note

1. For details of alternative approaches, see the Recommended Reading.

References

- Barrett, L. F. (2006). Are emotions natural kinds? *Perspectives on Psychological Science*, 1, 28–58.

- Baumeister, R. F., Vohs, K. D., DeWall, C. N., & Zhang, L. (2007). How emotion shapes behavior: Feedback, anticipation, and reflection, rather than direct causation. *Personality and Social Psychology Review*, 11, 167–203.
- Bench, S. W., & Lench, H. C. (2019). Boredom as a seeking state: Boredom prompts the pursuit of novel (even negative) experiences. *Emotion*, 19, 242–254.
- Berlyne, D. E. (1960). *Conflict, arousal and curiosity*. New York, NY: McGraw-Hill.
- 'Bored' workers 'cremated mouse' that led to shop fire. (2019, May 20). *BBC News*. Retrieved from <https://www.bbc.com/news/uk-england-suffolk-48341171>
- Chin, A., Markey, A., Bhargava, S., Kassam, K. S., & Loewenstein, G. (2017). Bored in the USA: Experience sampling and boredom in everyday life. *Emotion*, 17, 359–368.
- Clore, G. L., Gasper, K., & Garvin, E. (2001). Affect as information. In J. P. Forgas (Ed.), *Handbook of affect and social cognition* (pp. 121–144). Mahwah, NJ: Erlbaum.
- Csikszentmihalyi, M. (2000). *Beyond boredom and anxiety: Experiencing flow in work and play*. San Francisco, CA: Jossey-Bass.
- Dal Mas, D. E., & Wittmann, B. C. (2017). Avoiding boredom: Caudate and insula activity reflects boredom-elicited purchase bias. *Cortex*, 92, 57–69.
- Eastwood, J. D., Frischen, A., Fenske, M. J., & Smilek, D. (2012). The unengaged mind: Defining boredom in terms of attention. *Perspectives on Psychological Science*, 7, 482–495.
- Exit Seating, 14 C.F.R. § 121.585 (2017).
- Ferguson, F., & McLean, S. (2019, February 11). Teen pointed gun at passing cars from M50 bridge 'was bored and messing.' *Echo*. Retrieved from <http://www.echo.ie/tallaght/article/teen-pointed-gun-at-passing-cars-from-m50-bridge-was-bored-and-messing>
- Fisher, C. D. (1993). Boredom at work: A neglected concept. *Human Relations*, 46, 395–417.
- Havermans, R. C., Vancleef, L., Kalamatanos, A., & Nederkoorn, C. (2015). Eating and inflicting pain out of boredom. *Appetite*, 85, 52–57.
- Hulleman, C. S., Godes, O., Hendricks, B. L., & Harackiewicz, J. M. (2010). Enhancing interest and performance with a utility value intervention. *Journal of Educational Psychology*, 102, 880–895.
- Kapoor, K., Subbian, K., Srivastava, J., & Schrater, P. (2015). Just in time recommendations: Modeling the dynamics of boredom in activity streams. In *Proceedings of the eighth ACM international conference on web search and data mining* (pp. 233–242). New York, NY: ACM.
- Kiryukhinia, Y., & Coleman, A. (2018, January 10). 'Bored' Russian man crashes armoured vehicle into shop. *BBC News*. Retrieved from <https://www.bbc.com/news/blogs-news-from-elsewhere-42634753>
- Mercer, K. B., & Eastwood, J. D. (2010). Is boredom associated with problem gambling behaviour? It depends on what you mean by 'boredom'. *International Gambling Studies*, 10, 91–104.
- Merrifield, C., & Danckert, J. (2014). Characterizing the psychophysiological signature of boredom. *Experimental Brain Research*, 232, 481–491.
- Milyavskaya, M., Inzlicht, M., Johnson, T., & Larson, M. J. (2019). Reward sensitivity following boredom and cognitive effort: A high-powered neurophysiological investigation. *Neuropsychologia*, 123, 159–168.
- Moynihan, A. B., Igou, E. R., & van Tilburg, W. A. P. (2017). Boredom increases impulsiveness: A meaning-regulation perspective. *Social Psychology*, 48, 293–309.
- Moynihan, A. B., van Tilburg, W. A. P., Igou, E. R., Wisman, A., Donnelly, A. E., & Mulcaire, J. B. (2015). Eaten up by boredom: Consuming food to escape awareness of the bored self. *Frontiers in Psychology*, 6, Article 369. doi:10.3389/fpsyg.2015.00369
- Nederkoorn, C., Vancleef, L., Wilkenhöner, A., Claes, L., & Havermans, R. C. (2016). Self-inflicted pain out of boredom. *Psychiatry Research*, 237, 127–132.
- Olson, M. A., & Fazio, R. H. (2008). Implicit and explicit measures of attitudes: The perspective of the MODE model. In R. E. Petty, R. H. Fazio, & P. Briñol (Eds.), *Attitudes: Insights from the new implicit measures* (pp. 19–63). New York, NY: Psychology Press.
- Paul, P. (2019, February 2). Let children get bored again. *The New York Times*. Retrieved from <https://www.nytimes.com/2019/02/02/opinion/sunday/children-bored.html>
- Pekrun, R., Goetz, T., Daniels, L. M., Stupnisky, R. H., & Perry, R. P. (2010). Boredom in achievement settings: Exploring control-value antecedents and performance outcomes of a neglected emotion. *Journal of Educational Psychology*, 102, 531–549.
- Petty, R. E., & Cacioppo, J. T. (1986). *The elaboration likelihood model of persuasion*. New York, NY: Springer.
- Phillips, S. W. (2016). Police discretion and boredom: What officers do when there is nothing to do. *Journal of Contemporary Ethnography*, 45, 580–601.
- Sansone, C., Weir, C., Harpster, L., & Morgan, C. (1992). Once a boring task always a boring task? Interest as a self-regulatory mechanism. *Journal of Personality and Social Psychology*, 63, 379–390.
- Silvia, P. J. (2006). *Exploring the psychology of interest*. New York, NY: Oxford University Press.
- Steinberger, F., Schroeter, R., & Watling, C. N. (2017). From road distraction to safe driving: Evaluating the effects of boredom and gamification on driving behaviour, physiological arousal, and subjective experience. *Computers in Human Behavior*, 75, 714–726.
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E., Jr. (2010). The interpersonal theory of suicide. *Psychological Review*, 117, 575–600.
- van Tilburg, W. A. P., & Igou, E. R. (2012). On boredom: Lack of challenge and meaning as distinct boredom experiences. *Motivation and Emotion*, 36, 181–194.
- van Tilburg, W. A. P., & Igou, E. R. (2016). Can boredom help? Increased prosocial intentions in response to boredom. *Self and Identity*, 16, 82–96.
- Walsh, D. C., Rudd, R. E., Biener, L., & Mangione, T. (1993). Researching and preventing alcohol problems at work: Toward an integrative model. *American Journal of Health Promotion*, 7, 289–295.
- Westgate, E. C., & Wilson, T. D. (2018). Boring thoughts and bored minds: The MAC model of boredom and cognitive engagement. *Psychological Review*, 125, 689–713.
- Westgate, E. C., Wilson, T. D., & Gilbert, D. T. (2017). With a little help for our thoughts: Making it easier to think for pleasure. *Emotion*, 17, 828–839.

- Weybright, E. H., Caldwell, L. L., Ram, N., Smith, E. A., & Wegner, L. (2015). Boredom prone or nothing to do? Distinguishing between state and trait leisure boredom and its association with substance use in South African adolescents. *Leisure Sciences*, 37, 311–331.
- Wilson, T. D. (2011). *Redirect: Changing the stories we live by*. New York, NY: Little, Brown.
- Wilson, T. D., Reinhard, D. A., Westgate, E. C., Gilbert, D. T., Ellerbeck, N., Hahn, C., . . . Shaked, A. (2014). Just think: The challenges of the disengaged mind. *Science*, 345, 75–77.