



# The mind is its own place: The difficulties and benefits of thinking for pleasure

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## Abstract

This chapter is concerned with a type of thinking that has received little attention, namely intentional “thinking for pleasure”—the case in which people deliberately fo-

cus solely on their thoughts with the goal of generating positive affect. We present a model that describes why it is difficult to enjoy one's thoughts, how it can be done successfully, and when there is value in doing so. We review 36 studies we have conducted on this topic with just over 10,000 participants. We found that thinking for pleasure does not come easily to most people, but can be enjoyable and beneficial under the right conditions. Specifically, we found evidence that thinking for pleasure requires both motivation and the ability to concentrate. For example, several studies show that people enjoy thinking more when it is made easier with the use of “thinking aids.” We present evidence for a trade-off model that holds that people are most likely to enjoy their thoughts if they find those thoughts to be personally meaningful, but that such thinking involves concentration, which lowers enjoyment. Lastly, we review evidence for the benefits of thinking for pleasure, including an intervention study in which participants found thinking for pleasure enjoyable and meaningful in their everyday lives.



## 1. INTRODUCTION

*The mind is its own place, and in it self  
Can make a Heav'n of Hell, a Hell of Heav'n  
Milton (1667, Paradise Lost, Book One, pp. 254–255)*

The ability to “just think”—to turn away from the external world and engage in thought and reflection—is a mark of what it is to be human. Certainly many other species possess sophisticated cognitive abilities enabling them to solve complex problems (Premack, 2007; Tomasello, 2014). Ravens, for example, re-hide food if they notice another bird watching them (Bugnyar & Heinrich, 2005), and dolphins recognize other individual dolphins even after many years' separation (Janik, Sayigh, & Wells, 2006). No other animal, however, seems able or willing to deliberately withdraw from the external world for sustained periods of time and focus solely on their thoughts. Indeed, it would be dangerous to do so in environments in which it is important to be constantly alert to dangers and opportunities.

Not only are human beings capable of retreating into their minds, they place considerable value on doing so, as exemplified by Rodin's famous statue *The Thinker*. Reflection and contemplation have been valued throughout recorded history (Webb, 2007). Nearly 2000 years ago, Marcus Aurelius (121–180 AD) advised that when people are “distracted by outward cares,” they should find “a space of quiet, wherein you can add to your knowledge of the Good and learn to curb your restlessness” (2005, p. 8). Anthropologists have noted that most societies have places

dedicated to seeking solitude and being alone with one's thoughts, such as monasteries or “cramped stone structures” (Lewis-Williams, 2004, p. 103).

What are people's goals at such times? What, for example, is Rodin's Thinker thinking about? One way of addressing this question is to consider the many functions of human consciousness, including integrating information from multiple sources, planning, directing behavior, promoting social interaction, and overriding automatic responses (e.g., Baars, 1997; Baumeister & Masicampo, 2010; Baumeister, Masicampo, & Vohs, 2015; Crick & Koch, 1990; Dehaene, Charles, King, & Marti, 2014; Flanagan, 1992; Wegner, 2002; Wilson, 2002). Perhaps Rodin's Thinker is using his conscious mind for one of these purposes.

In this chapter, we focus on another function of conscious thought that has received little attention: intentional thinking for pleasure. Given that seeking pleasure and avoiding pain is one of the strongest of all human motives (Thorndike, 1927), it seems reasonable that people would employ conscious thinking with that aim, to improve their mood or reduce stress. After all, when people have little to do, they have an ever-present resource to keep them from getting bored: their own minds. People are free to retrieve pleasant memories, savor future events, construct elaborate fantasies, or enjoy their thoughts in other ways. In Emily Dickinson's words, “The brain is wider than the sky” (Dickenson, 1951, p. 312).

There are well-known cases of people who were able to use their mind in this manner. Henry Thoreau famously spent 2 years at Walden Pond reflecting on his life, reporting that, “Sometimes, in a summer morning, having taken my accustomed bath, I sat in my sunny doorway from sunrise till noon, rapt in a reverie” (Thoreau, 1854/2009, p. 55). Dr. Edith Bone, imprisoned in solitary confinement for 7 years by the communist Hungarian regime, passed the time by retreating into her “well-stocked, disciplined mind” (quoted by Storr, 1988, p. 48; see Bone, 1966). Ronald Ridgeway spent 5 years as a prisoner of war in North Vietnam, where he was repeatedly interrogated and beaten by his captors. He survived by creating an imaginary world in which he had a wife and children, owned a pick-up truck, and went fishing in his spare time. He reported that spending 3 days in his fantasy world occupied him for an entire day in his stark real world (Ruane, 2017). Another Vietnam POW, who spent 3 years in solitary confinement, recalled that he and other pris-

oners “relived pleasant past relationships and even had elaborate breakfasts each Sunday (all in our imaginations)” (Shumaker, 2010). Some find thinking for pleasure so alluring that it interferes with their everyday functioning, a phenomenon dubbed “maladaptive daydreaming” (Bigelsen, Lehrfeld, Jopp, & Somer, 2016; Somer, 2002).

Yet these examples of intentionally enjoying one's thoughts appear to be exceptions rather than the rule. In one survey, only 17% of Americans reported spending any time in the last 24 hours “relaxing/thinking,” even though 95% reported spending time on other leisure activities (American Time Use Survey, 2012). In another study, college students who were texted at random times during the day reported that they were deliberately trying to have pleasant thoughts only 7% of the time (Westgate, Wilson, & Gilbert, 2017). Other studies show that people do not like being idle and generally prefer doing something over nothing (Hsee, Yang, & Wang, 2010; Wilcox, Laran, Stephen, & Zubcsek, 2016), or doing something over not doing something (Albarracín, Sunderrajan, Dai, & White, 2019).

So which is it? Is intentional thinking for pleasure a common, enjoyable activity, as it was for Thoreau, or a difficult mental activity with little benefit? If the latter, does that help explain why so many of us readily reach for our phones instead of spending a few moments enjoying our thoughts? And if it is difficult, are there ways of making it easier? We will address these questions by reviewing the relevant literatures, discussing a program of research on intentional thinking for pleasure, and presenting a model that describes why it is difficult to enjoy one's thoughts, how it can be done successfully, and whether there is value in doing so.



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## **2. RESEARCH ON DAYDREAMING AND MIND WANDERING**

Although there has been a great deal of research on how people think about themselves and the external world, there is relatively little on the affective consequences of such thoughts. Of the studies that have been done, many find that conscious thought can be aversive, such as research on ruminative thought and obsessive thinking (Liu & Thompson, 2017; Martin & Tesser, 1996; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Wegner & Zanakos, 1994). For instance, research on counterfac-

tual thinking finds that people often engage in “what if” types of thinking after negative events (e.g., “If only I had taken my normal route to work, I wouldn't have had the car accident”), and that this type of thinking exacerbates negative affect rather than reducing it (Roese & Olson, 1997). People could, in theory, use counterfactual thinking to feel better about negative events by engaging in downward comparisons (e.g., “I could have been injured in the accident more seriously than I was”), but research has shown that spontaneous downward counterfactuals are uncommon in everyday life (Roese & Epstude, 2017).

Perhaps more relevant are studies that have examined daydreaming and mind wandering, including Singer's seminal work (McMillan, Kaufman, & Singer, 2013; Singer, 1955, 1975a, 1975b), influential contributions by Antrobus (1968), Giambra (1989), and Klinger (1990), and an explosion of recent research on the topic (e.g., Christoff, Irving, Fox, Spring, & Andrews-Hanna, 2016; McVay & Kane, 2010; Seli et al., 2018; Smallwood & Schooler, 2006). Given the size of this literature, one might think that there would be many studies of how enjoyable it is to engage in daydreaming or mind wandering. In fact, relatively few studies in this area have used enjoyment or mood as a dependent measure. Those that have do not find support for the idea that daydreaming or mind wandering are highly enjoyable activities.

Singer (1955, 1975a; McMillan, Kaufman, & Singer, 2013), for instance, identified three styles of daydreaming: guilty-fear-of-failure daydreaming, poor attentional control, and positive constructive daydreaming. These styles, conceived as individual difference variables, were derived from factor analyses of people's reports about their daydreams. Notably, the first two styles were said to be associated with a considerable degree of negative affect, such as “tortured self-examination” and a “generally negatively toned fantasy life” (Singer, 1975a, p. 730). The third factor, positive constructive daydreaming, was hypothesized to be a pleasant activity; McMillan et al. (2013) described it as “characterized by playful, wishful imagery, and planful, creative thought” (p. 1). But although there is evidence for some benefits of this type of mind wandering, notably an increase in creativity (Baird et al., 2012; Gable, Hopper, & Schooler, 2019), evidence that it is enjoyable is, at best, mixed.

In one of the few early studies that manipulated daydreaming experimentally and measured affect, Singer and Rowe (1962) administered a surprise midterm exam in a college class and then randomly assigned the

students to spend 10 minutes either daydreaming or completing an attitude questionnaire (the control condition). Participants in the daydreaming condition subsequently reported significantly more anxiety than did participants in the control condition, which is contrary to the idea that daydreaming increases positive affect. Of course, the researchers deliberately asked participants to daydream after a negative experience; do people enjoy daydreaming under other circumstances?

Studies have tested this question by asking participants, under more neutral conditions, to rate the valence of their thoughts when their minds wander, such as when they are performing a cognitive task or resting in an fMRI scanner. Participants typically rate such thoughts as neutral or only slightly positive (e.g., Diaz et al., 2013; Stawarczyk, Cassol, & D'Argembeau, 2013; Stawarczyk, Majerus, Maj, Van der Linden, & D'Argembeau, 2011; Tusche, Smallwood, Bernhardt, & Singer, 2014). Stawarczyk et al. (2013), for example, interrupted people while they were performing a number detection task and asked them whether their minds had wandered, and if so, to rate the valence of their thoughts. The mean rating was near zero (on a scale in which  $-3 = \textit{very negative}$  and  $+3 = \textit{very positive}$ ). Tusche et al. (2014) asked participants to rate the valence of their thoughts while they were resting in an fMRI scanner. Again, the average ratings were only slightly positive on a scale that ranged from  $-3$  to  $+3$  ( $0.32 \pm 0.26$  in one session,  $0.77 \pm 0.52$  in another).

Even when people do think about pleasant topics, they may not have an overall positive experience. One study found that participants who were induced to let their minds wander to enjoyable topics, while performing a monotonous task, felt worse afterwards than did participants who were induced to let their minds wander to negative topics (Critcher & Gilovich, 2010). The participants seem to have inferred that if their minds had wandered to positive topics, the monotonous task they were performing must be especially boring.

Other studies have used experience sampling methodologies to see how happy people are while mind wandering in their everyday lives. Several such studies found that people were less happy when their minds were wandering than when they were not (Choi, Catapano, & Choi, 2017; Franklin et al., 2013; Killingsworth & Gilbert, 2010; Ruby, Smallwood, Engen, & Singer, 2013; Song & Wang, 2012). In one study, for example, participants rated their happiness when texted by the re-

searchers and then indicated which of 35 activities they had been doing and whether their minds had wandered during that activity. Participants reported significantly lower happiness when they had been mind wandering than when they had not been mind wandering. They also reported a lowered sense of meaning while mind wandering (Choi et al., 2017).

To summarize, the evidence suggests that the topics people bring to mind when their minds wander are neutral or slightly positive on average, but that people report lower happiness when mind wandering than when not mind wandering. It is difficult to draw firm conclusions from these studies, however, because the researchers defined “daydreaming” and “mind wandering” in multiple, sometimes contradictory ways (Seli et al., 2018). Studies have investigated a wide array of kinds of thought under the umbrella term “mind wandering,” including task-unrelated thought, unintentional thought, stimulus-independent thought, unguided thought, and counterfactual reasoning. Many studies, for example, examined the case in which people were trying to pay attention to something in the external world, such as a book they were reading, while their mind involuntarily wandered from this primary task (task-unrelated thought). It seems reasonable that under these conditions, people interpret mind wandering as a sign that they are dissatisfied or bored with the primary task (Critcher & Gilovich, 2010).

In contrast, we are interested in the case in which thinking for pleasure *is* the primary task, namely when people choose to focus their attention inward in the absence of any external task. McMillan et al. (2013, p. 4) referred to this as “volitional daydreaming,” but noted that there has been little research on the topic. Seli, Risko, and Smilek (2016) found that people do sometimes engage in deliberate mind wandering, but were concerned with task-unrelated thought, namely times when participants were supposed to be performing another task. Nor did they examine whether people's goal was to improve their affect when engaging in intentional mind wandering or whether they were successful at doing so (cf. Giambra, 1995; Seli, Risko, Smilek, & Schacter, 2016).

Because the term “mind-wandering” has been used in so many different ways, researchers need to be clear about the specific type of thought they are studying (Seli et al., 2018). In that spirit, we note that intentional thinking for pleasure has three distinct qualities: First, as noted, it is stimulus-independent, in that the primary task is to think and not to pay attention to something in the external world. Second, it is goal-driven, in that

people adopt the goal to have an enjoyable experience, as opposed to accomplishing some other aim (e.g., to engage in planning or problem solving). Third, it is intentional, in that people are consciously attempting to have a pleasurable experience.

### **2.1. Why *intentional* thinking for pleasure?**

A reasonable question is why we are focusing on intentional thinking for pleasure when people may also enjoy pleasurable thoughts that come to mind unintentionally. Most people have had the experience of enjoying their thoughts without deliberately trying to do so, perhaps during a pleasant walk. By limiting our focus to intentional thought, we could thus potentially be ignoring a major source of the pleasure that people derive from their thoughts. It is even possible that people enjoy their thoughts more when they are *not* trying to steer them in pleasurable directions, but instead allowing their thoughts to wander where they may. Just as it is difficult to be happy when intentionally trying to be (Mauss, Tamir, Anderson, & Savino, 2011; Schooler, Ariely, & Loewenstein, 2003), so may it be difficult to initiate and maintain enjoyable thoughts intentionally.

As noted earlier, there is little evidence that mind wandering is an enjoyable activity, but few of those studies distinguished between the affective effects of intentional vs. unintentional mind wandering. In one that did, participants were asked not only how negative or positive their thoughts had been while mind wandering, but also how intentional those thoughts were and what the function of the thoughts had been (Stawarczyk et al., 2013). Intentional mind wandering was rare; the mean rating was just over 2 on a 7-point scale, where 1 = *not at all intentional* and 7 = *totally intentional*. Further, only 10% of the time did participants report that the function of their mind wandering was to feel better, suggesting that most mind wandering episodes occurred unintentionally and without the goal of enjoyment. And yet, contrary to the hypothesis that unintentional mind wandering is largely positive in valence, the mean affect was close to the neutral point of the scale.

In an experience sampling study, we also assessed the intentionality of thought and people's enjoyment of those thoughts (Westgate et al., 2017). We texted college students four times a day for one week. Each time participants received a text, they reported how intentional their thoughts had been and how positive or negative their mood and thoughts



were. Participants reported that pleasant thoughts were more positive when they occurred unintentionally than intentionally, which is consistent with the idea that unintentional thinking could be more pleasurable. However, participants also reported that unpleasant thoughts were more negative when they occurred unintentionally than intentionally. In other words, unintentional thoughts were more positive if they were pleasant but more negative if they were unpleasant, compared to when thoughts were intentionally brought to mind (Westgate et al. referred to this as the spontaneity intensification hypothesis).

There is thus little evidence for the hypothesis that unintentional thoughts are generally positive. To be fair, there may be circumstances under which pleasant thoughts pop into mind unprompted (e.g., while taking a walk), even though surveys and experience sampling studies show that people rarely report such experiences. Even so, it is important to study intentional thinking for pleasure because, by definition, this type of thought is more under people's control and thus more easily employed as an emotion-regulation strategy. That is, even if it is true that people sometimes stumble upon thoughts that make them happy or sad, it would be to people's advantage to try to control that process and deploy mood-boosting thoughts intentionally or strategically (assuming they could do so successfully). We will see that intentional thinking for pleasure is not easy, but that adopting the goal of thinking for pleasure may be a heretofore neglected way of having both an enjoyable and meaningful experience.



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### **3. INITIAL STUDIES OF INTENTIONAL THINKING FOR PLEASURE**

To see whether people enjoy thinking for pleasure when that is their primary goal, we conducted several studies in which we asked participants to spend a few minutes enjoying their thoughts when alone (Wilson et al., 2014). Some of these studies were done in the laboratory, where college students stored all of their belongings (e.g., cell phones, writing implements) and sat alone in an unadorned room for a short period of time (from 6 to 15 minutes, depending on the study). In other studies, participants took part online in their own homes, after agreeing to turn off all electronic devices. We anticipated that most participants

would enjoy a brief respite from the demands of the external world and enjoy their own thoughts. But we were wrong.

In our initial studies, participants reported that “just thinking” was, on average, somewhat boring, somewhat enjoyable, and that it was difficult to concentrate on their thoughts (Wilson et al., 2014). In the studies in which we asked participants to “just think” at home after putting aside all distractions, 32% admitted to “cheating” by engaging in activities that they had been repeatedly asked to avoid, such as texting and messaging on their cell phones, instead of occupying themselves with their own thoughts. In a subsequent study, participants in 11 countries enjoyed thinking much less than spending the same amount of time on everyday external activities, such as watching a video, reading, or working on a puzzle. Indeed, when randomly assigned to spend 12 minutes either enjoying their own thoughts or engaged in their choice of an external solitary activity, participants in every country enjoyed “doing” more than thinking (Buttrick et al., 2018; Wilson et al., 2014, Study 8; see also Camerer et al., 2018 and Smith & Frank, 2015). Similarly, Albarracín et al. (2019) found that people rated doing something (“action”) more positively than not doing something (“inaction”).

Given that our participants did not find intentional thinking for pleasure to be particularly easy or enjoyable, we wondered whether people would prefer an unpleasant activity to relying solely on their thoughts. To find out, we conducted a two-part study (Wilson et al., 2014, Study 10). In Part 1, participants rated the pleasantness of a series of stimuli, some of which were positive (e.g., attractive photographs) and some negative (e.g., a mild electric shock). In Part 2, participants were left alone for 15 minutes and instructed to enjoy their thoughts. They learned that the shock apparatus was still active and that they would receive a shock again if they pressed a button. We explained at some length that their goal should be to enjoy their thoughts and that it was entirely up to them as to whether to press the shock button.

If thinking for pleasure is an engaging, enjoyable activity, participants should not feel the need to administer themselves unpleasant shocks. In fact, 67% of men and 25% of women gave themselves at least one shock during the thinking period. In a related experiment, Havermans, Vancleef, Kalamatianos, and Nederkoorn (2014) had participants watch a boring film for an hour (an 85-second repeated loop of two men playing tennis), with the opportunity to self-administer electric shocks. In princi-

ple, participants could have relieved their boredom by retreating into their minds and enjoying their thoughts. But apparently thinking wasn't sufficient to alleviate boredom: almost all participants (93%) shocked themselves, and did so an average of 22 times (see also Nederkoorn, Vancleef, Wilkenhöner, Claes, & Haverman, 2016).

In short, intentional thinking for pleasure is not something that people do very often or enjoy very much when they do. As noted by Milton in the opening quote to this article, it appears that people's thoughts can just as easily make a “Hell of Heav'n” as a “Heav'n of Hell.” Here we explain why, by presenting a model that describes why it is difficult to enjoy one's thoughts, how it can be done more successfully, and whether there is any value to doing so. We will review data from all of the studies we have conducted on this topic, including analyses of the entire data set, which includes just over 10,000 participants. This data set includes 21 studies we have previously published on this topic (Alahmadi et al., 2017; Buttrick et al., 2018; Westgate et al., 2017; Wilson et al., 2014), two unpublished studies we will report here in some detail, as well as pilot studies, studies with null results, and studies that turned out to be difficult to interpret—in short, every study we have conducted on this topic.<sup>a</sup> All of the studies are summarized in the supplementary materials. The complete dataset is available upon request and we hope others take advantage of it as well.<sup>b</sup>



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## 4. A MODEL OF THINKING FOR PLEASURE

We suggest that thinking for pleasure is a skill that requires both motivation and ability to do well (Westgate & Wilson, 2018). Like any other type of conscious mental activity—such as making a shopping list, trying not to think of a white bear, or evaluating a persuasive communication—people must want to do it and have the requisite cognitive resources to do so (Gilbert, 1991; Petty & Cacioppo, 1986; Wegner, 1994). In the case of thinking for pleasure, people must select topics that they enjoy thinking about, initiate thinking about those topics, monitor their thoughts to make sure that they stay on topic, and keep competing

<sup>a</sup> We include all data collected and analyzed as of December 1, 2018. Note that a few of the studies were included in a meta-analysis reported by Westgate and Wilson (2018).

<sup>b</sup> The complete data set, SPSS syntax file, variable manual, and Qualtrics files that were used to run many of the studies are available upon request from the first author. Supplemental materials that describe all studies and additional analyses can be found at: <https://osf.io/t856x/>.

thoughts out of consciousness, all of which, we suggest, tax cognitive resources. Consistent with this view, participants in our studies reported that it was relatively difficult to concentrate on their thoughts while trying to think for pleasure, and the more difficult they reported it was, the lower their enjoyment,  $b = -0.83$  ( $SE = 0.02$ ),  $t(7,106.28) = -40.13$ ,  $R_{\beta}^2 = 0.19$  [0.17, 0.20],  $P < 0.001$ .<sup>c</sup> Put differently, as predicted, people enjoyed their thoughts more when they were able to concentrate successfully.

However, being able to concentrate is not enough; people must also be motivated to enjoy their thoughts. No matter how capable people are of thinking for pleasure, they will not succeed in doing so if they don't try. They may not try very often, either because it is difficult, because they don't believe it would be worthwhile, or both. Consistent with this view, the more participants in our studies said that their goal was to have pleasant and entertaining thoughts, the more enjoyment they reported,  $b = 0.70$  ( $SE = 0.03$ ),  $t(4,921.34) = 26.01$ ,  $R_{\beta}^2 = 0.12$  [0.10, 0.14],  $P < 0.001$ . That is, people who were motivated to enjoy their thoughts, and had the goal of doing so, did.<sup>d</sup>

Our model assumes ability and motivation contribute independently to the enjoyment of thinking. To test this hypothesis, we conducted a mixed effects analysis across the 37 studies and pilots that included all of the measures, with a total  $N = 4735$ . We treated study as a random effect, predicting enjoyment from participants' reported ability (participants' standardized reports of how difficult it was to concentrate), motivation (participants' standardized reports of the extent to which their goal was to think for pleasure), and the interaction of the two. As predicted, ability and motivation each predicted enjoyment,  $b = -0.70$  ( $SE = 0.02$ ),

<sup>c</sup> In virtually all studies, enjoyment of thinking was assessed by averaging participants' responses to three questions: How enjoyable, entertaining, and boring (reverse scored) the thinking period was, each assessed on 9-point scales with 1 = *not at all*, 5 = *somewhat*, and 9 = *extremely*. Collapsed across studies ( $N = 6896$ ), the alpha of this enjoyment index was 0.90. The question about concentration asked, "How hard was it to concentrate on what you chose to think about?," answered on a 9-point scale where 1 = *not at all*, 5 = *somewhat*, and 9 = *very much*. When analyzing the data across studies, we used mixed effects models with a random intercept for each study; preliminary model comparisons suggested these models were, overall, the best fit for the data. Results are very similar when random slopes are included in the models; results of these analyses can be found in the supplemental materials. All effects sizes were computed with Page-Gould's (2013) formula, with confidence intervals based on 1000 bias-corrected bootstrapped samples. Not all measures were included in all studies, so the sample sizes in these analyses throughout the paper vary.

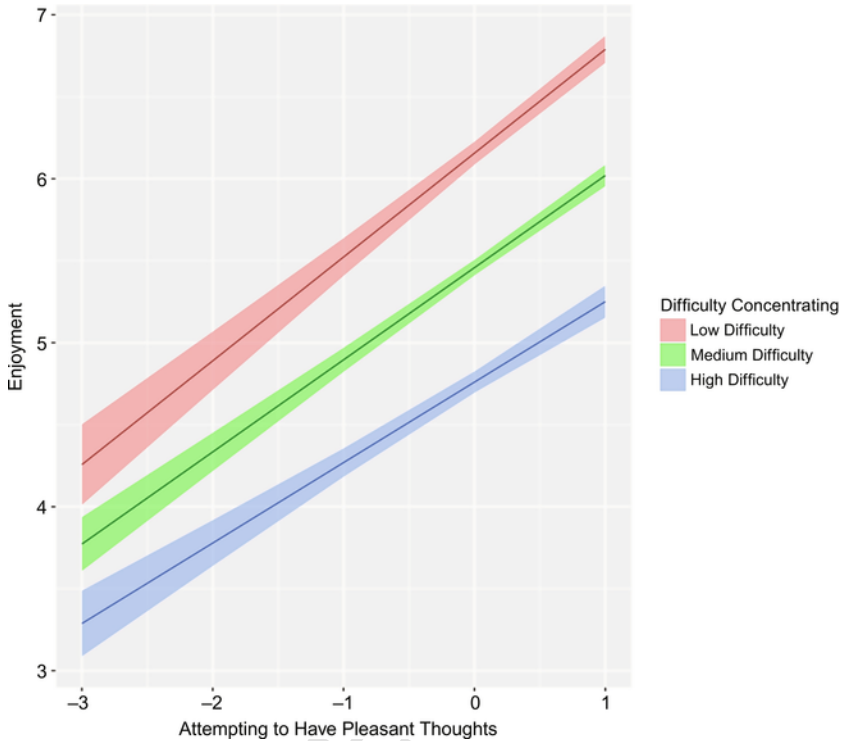
<sup>d</sup> The question about motivation asked, "To what extent was your goal to think about things that were pleasant or entertaining?," answered on a 9-point scale where 1 = *not at all*, 5 = *somewhat*, and 9 = *very much*.

$t(4,799.51) = -29.05$ ,  $R_{\beta}^2 = 0.15$  [0.13, 0.17], and  $b = 0.56$  ( $SE = 0.03$ ),  $t(4,795.36) = 21.87$ ,  $R_{\beta}^2 = 0.10$  [0.07, 0.11], respectively,  $P$ s  $< 0.001$  (see Fig. 1). People enjoyed thinking for pleasure more when they were able or motivated to do so, even when controlling for each other.<sup>c</sup> Given the large sample size the interaction was also significant,  $b = -0.07$  ( $SE = 0.02$ ),  $t(4,779.10) = -3.10$ ,  $R_{\beta}^2 = 0.002$  [-0.0018, 0.0051],  $P = 0.002$ , but as seen from Fig. 1 its size was negligible (the lines are nearly parallel). People enjoyed thinking for pleasure most when both ability and motivation were high, and enjoyed it least when both ability and motivation were low.

These results are consistent with the hypothesis that ability and motivation are important components of thinking for pleasure. The effects are relatively large; for example, the estimated enjoyment for people low on both ability and motivation (one standard deviation below the means) is 4.27 on the 9-point enjoyment scale, whereas the estimated enjoyment for people high on both (one standard deviation above the means) is 6.79. Further, we note that enjoyment of thinking is correlated with the Need for Cognition (Cacioppo & Petty, 1982), which assesses people's motivation and ability to engage in effortful cognitive activities,  $b = 0.43$  ( $SE = 0.03$ ),  $t(3,248.35) = 13.14$ ,  $R_{\beta}^2 = 0.05$  [0.03, 0.07],  $P < 0.001$ . (Later we report the results of other individual difference variables.) That is, people dispositionally high in the motivation and ability to think reported greater enjoyment of thinking in our studies, as did those who reported high state levels of motivation and ability in the moment.

It is perhaps not surprising that thinking for pleasure, like many other tasks, requires both ability and motivation. As will be seen shortly, our model goes beyond this simple observation to detail the kinds of thoughts that people find enjoyable. In brief, we propose a trade-off extension of our model, whereby people are most likely to enjoy their thoughts if they find those thoughts to be personally meaningful, but that such thinking involves concentration, which lowers enjoyment. Before discussing these refinements, however, it is important to note that the evidence we have discussed so far for the role of ability and motivation is correlational and thus open to alternative explanations. A better test would be to experimentally manipulate ability and motivation, both of which we have done.

<sup>c</sup> There was a modest negative relation between difficulty concentrating and the goal of having pleasant thoughts when collapsed across all studies,  $r(4,805) = -0.23$ ,  $P < 0.001$ .



**Fig. 1.** Predicting Enjoyment of Thinking from Motivation and Difficulty in Concentrating. Note. Enjoyment is the mean of three ratings on 9-point scales: how enjoyable people found thinking, how entertaining, and how boring (reverse scored),  $\alpha = 0.90$ .

#### 4.1. Ability

In four studies, Westgate et al. (2017) randomly assigned some participants to receive a simple “thinking aid” designed to make it easier to think for pleasure. Participants listed eight topics they would enjoy thinking about and were then asked to think about those topics while alone for 4–6 minutes. In the thinking aid conditions (randomly assigned), participants received a reminder during the thinking period of the topics they had listed earlier. In some studies, the topics appeared on a computer screen one at a time during the thinking period; in others, participants wrote their topics on index cards and were able to consult these cards during the thinking period. Participants in the control condition also listed topics, but were not reminded of those topics during the thinking period. Westgate et al. (2017) hypothesized that (a) the simple reminder

of the topics would reduce cognitive load, because participants would not have to exert energy recalling and selecting topics from memory, and that (b) this reduction in cognitive load would increase how enjoyable it was to think for pleasure. Both hypotheses were supported. Participants in the thinking aid conditions reported significantly higher enjoyment, mediated by decreases in how difficult they said it was to concentrate on their thoughts and how much their minds wandered. In other words, the thinking aid made thinking easier, and to the extent it did so, people enjoyed it more.

If thinking for pleasure requires effort, then the longer people try to do it, the more difficult and less enjoyable it should be. The thinking period in our studies varied in length from 1.5 to 15 minutes, and indeed, the longer it was (across studies), the more difficult participants found it to concentrate,  $b = 0.077$ ,  $SE = 0.016$ ,  $t(95.142) = 4.77$ ,  $R_{\beta}^2 = 0.19$  [0.12, 0.35],  $P < 0.001$ , and the less enjoyable they found it to be,  $b = -0.068$ ,  $SE = 0.016$ ,  $t(156.534) = -4.40$ ,  $R_{\beta}^2 = 0.11$  [0.04, 0.21],  $P < 0.001$ . It should be noted that we randomly assigned participants to thinking periods of different length in Study 19 (1.5 vs. 3 minutes), Study 25 (3 vs. 6 minutes), and Study 31 (3 vs. 12 minutes). Although in each case participants reported lower enjoyment of the thinking periods of longer duration, this difference was significant only in Study 31,  $M_s = 6.56$  vs.  $6.00$  ( $SD_s = 1.78, 2.06$ ),  $t(365) = 2.21$ ,  $P = 0.028$ ,  $d = 0.30$ .

There is one way, however, in which we did not succeed in helping people concentrate more on their thoughts, and that is in tests of what we called the “scanner hypothesis.” When there is nothing in the external world to occupy people’s attention, we reasoned, they might actually experience cognitive load, because their attentional system constantly “scans” the world without “locking on” to any one thing. We hypothesized that giving people a minimally engaging external stimulus to attend to might make it easier to concentrate on their thoughts by reducing this load (cf. Baird et al., 2012). Consistent with this hypothesis, Westgate et al. (2017) found in their experience sampling study that thinking for pleasure was most common when people were engaged in undemanding mundane activities, including showering, walking, and riding the bus. But alas, we have found no support for the scanner hypothesis in studies in which we randomly assigned participants to think for pleasure while also performing mildly distracting tasks, including walking on a treadmill (vs. sitting in a chair); having an object to fiddle with; watching a

minimally engaging screen saver on a computer; performing a simple card sorting task, or keeping their eyes open vs. closed. One reason these manipulations failed may be because none had the hypothesized effect of making it easier for people to concentrate on their thoughts (see the Supplementary Materials for a full description of these studies, namely Studies 4, 17, 22, 24, 25, 26.1, 26.2, 28, 30.1, 30.2). Perhaps studies that succeed in making it easier for people to concentrate on one's thoughts, by giving them minimally engaging tasks, will find better support for the scanner hypothesis.

In sum, both correlational and experimental evidence suggest that one reason people do not enjoy thinking for pleasure is simply that it is effortful. People can—and do—enjoy cognitively-taxing activities (e.g., chess; Inzlicht, Shenhav, & Olivola, 2018), but only when they have sufficient mental resources to do so. The same appears to be true of thinking for pleasure.

## 4.2. Motivation

As noted earlier, the more people in our studies reported that their goal was to have pleasant and entertaining thoughts, the more enjoyment they reported. These results were correlational, however. Alahmadi et al. (2017) thus tested the motivation hypothesis by randomly assigning participants to one of two conditions: Our standard thinking condition in which participants were asked to entertain themselves with their thoughts, or a control condition in which participants were asked to think about whatever they wanted. Note that if people already had the goal to enjoy their thoughts, there should be little difference between these conditions—participants in both would be motivated to think for pleasure. If people do not normally adopt this goal, however, and if doing so increases the likelihood that people will succeed in thinking for pleasure, then those in the standard “enjoy thinking” condition should enjoy thinking more than those in the control “think about whatever you want” condition.

This latter possibility turned out to be the case in four studies (Alahmadi et al., 2017). Participants in the “enjoy your thoughts” condition, relative to those in the control condition, reported more of a goal to have pleasant thoughts, less of a goal to make plans, and less mind wandering. And in turn, each of these three variables significantly mediated the effects of condition on thought enjoyment. The overall effect of ex-



explicitly instructing people to think for pleasure on their subsequent enjoyment of thinking was relatively large when averaged across studies,  $d = 0.72$  [0.56, 0.88].

Nguyen, Ryan, and Deci (2017) similarly found that participants explicitly prompted to think about pleasant topics during a 15 minute solitary period reported more positive thoughts and enjoyed those thoughts more, compared to participants asked to sit alone without such instructions, or participants prompted to think about neutral topics. As in Alahmadi et al. (2017), those participants who were given the goal of thinking also reported less difficulty concentrating and that their minds wandered less than participants who received no such instructions.

Although these results are consistent with our hypothesis that having the goal to think for pleasure increases enjoyment, there is another possibility: demand characteristics. Perhaps participants who were asked to enjoy their thoughts only said they did, in order to be cooperative, when in fact they did not enjoy themselves any more than participants in the control condition. Evidence contrary to this interpretation comes from participants' descriptions of what they thought about during the thinking period. We analyzed these descriptions with LIWC text analysis software (Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007) and found that participants asked to enjoy their thoughts were more likely to report thinking about social topics and positive emotions, and that these variables significantly mediated the effects of condition on thought enjoyment. This helps rule out demand characteristics, because it is unlikely that participants were so cooperative that they reported that their goal was to think about pleasurable topics (even though it wasn't), that they enjoyed their thoughts more (even though they didn't), and that they had thought about topics that they had not actually thought about.

An interesting question is why participants in the control conditions of Alahmadi et al.'s (2017) studies, who were asked to think about whatever they wanted, did not choose to think for pleasure (indeed, they reported that their goal was less to think for pleasure and more to engage in planning). There are at least two possibilities: Participants did not recognize that it would be enjoyable to think for pleasure and thus did not try to do so, or they knew that thinking for pleasure would be enjoyable but they had other goals (e.g., planning) that they deemed a better use of their time. The evidence for the first possibility is mixed. In Study 5 of Alahmadi et al. (2017), forecaster participants predicted that thinking for

pleasure would be slightly more enjoyable than thinking about whatever they wanted, but this difference was smaller than that observed in Studies 1–4 between those instructed to think for pleasure vs. think about whatever they wanted. In other forecasting studies, however (reported in the supplemental materials to Alahmadi et al.), when given a more detailed description of the experimental instructions, participants better recognized that they could succeed in thinking for pleasure if they tried.

The evidence for the second possibility is clearer: Forecasters predicted that thinking for pleasure would not be very worthwhile, especially compared to spending the same amount of time planning what they need to get done in the future. Perhaps participants in the control “think about whatever you want” conditions weighed the benefits of enjoying their thoughts against the benefits of other kinds of thought (e.g., planning), and concluded that they were better off doing the latter. Were they right? Although it is difficult to assess how beneficial or worthwhile different kinds of thinking are in both the short and long term, there is evidence that forecasters were underestimating one benefit of thinking for pleasure: How meaningful they would find it to be. The forecasters predicted that engaging in planning would be more personally meaningful than trying to enjoy their thoughts. This was not the case, however, in the Alahmadi et al. (2017) study that included meaningfulness as a dependent measure of thinking. In that study, participants asked to enjoy their thoughts reported that the experience was *more* meaningful than did those asked to think about whatever they wanted, though the difference was only marginally significant ( $P = 0.10$ ). As will be seen shortly, we replicated this finding in subsequent studies, suggesting that people find thinking for pleasure to be particularly meaningful.

### 4.3. The trade-off model

Thus far we have seen that both ability and motivation predict how enjoyable people will find thinking for pleasure. But does it matter what people think about? As just mentioned, one hypothesis is that people are especially likely to enjoy their thoughts when they find those thoughts to be personally meaningful. For example, even when people have the ability and motivation to think for pleasure, they might find it unenjoyable to focus on trivial topics, but more enjoyable to think about meaningful ones, such as their family and friends. Other research has found that writing about oneself in various ways (e.g., about specific, hypothetical

events) can enhance a sense of meaning in life (King, Heintzelman, & Ward, 2016; Vazeou-Nieuwenhuis, 2018; Waytz, Hershfield, & Tamir, 2015); by the same token, thinking about meaningful topics might be especially enjoyable.

We recently investigated this hypothesis in two ways. First, we compared thinking for pleasure to an external activity that many people find to be enjoyable, but perhaps not very meaningful: Playing a video game (Raza et al., 2019). We predicted that thinking for pleasure would be more meaningful than playing a video game, and to the extent it was, people would enjoy it more. However, based on our prior work on ability, we predicted that thinking for pleasure would require more concentration and effort than playing the video game, and to the extent that was true, people would enjoy it less. In other words, we expected thinking for pleasure to involve a trade-off: More meaning, which would increase enjoyment, but also more effort, which would decrease enjoyment.

Second, we examined an individual difference measure that, based on this analysis, should moderate the effects of thinking on enjoyment: dispositional meaning in life, as assessed with the Meaning in Life Questionnaire-Presence scale (MLQ-P; Steger, Frazier, Oishi, & Kaler, 2006). If it is the case that people who generate personally meaningful thoughts enjoy thinking the most, then people who report greater meaning in life should be especially likely to generate such thoughts and thus enjoy thinking more. Consistent with this hypothesis, research has found that people high in meaning in life find it easier to list thoughts about their true selves (Schlegel, Hicks, King, & Arndt, 2011), are more likely to integrate thoughts about the past, present, and future (Baumeister, Vohs, Aaker, & Garbinsky, 2013), and are more likely to think about their legacy in life (Wade-Benzoni & Tost, 2009). We reasoned that people high in meaning in life would be more likely to generate meaningful topics, thereby increasing their enjoyment of thinking.

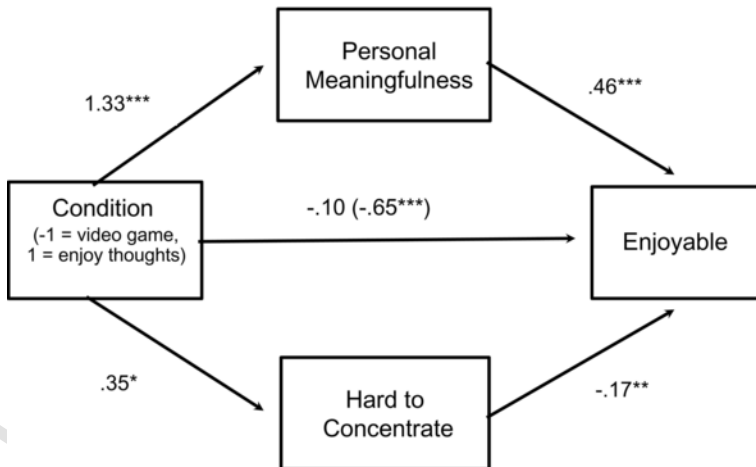
To test this hypothesis, participants completed the MLQ-P scale early in the semester and then participated in a laboratory session in which they were randomly assigned to spend 4 minutes playing an enjoyable video game or thinking for pleasure (Raza et al., 2019, which is Study 35 in the supplemental materials). Participants rated how personally meaningful and enjoyable their activity (thinking or the video game) was and how difficult it was to concentrate. We predicted that (a) participants would find thinking for pleasure to be more meaningful than playing the

video game, increasing how enjoyable thinking was, but that thinking would also require more concentration, reducing how enjoyable it was; and (b) these results would be moderated by participants' dispositional levels of MLQ-P.

As seen in Fig. 2, our first prediction about the trade-off of thinking for pleasure was supported in a bootstrapping analysis with 10,000 samples (Hayes, 2013). The indirect effect of personal meaningfulness was significant,  $a_1b_1 = 0.616$  ( $SE = 0.138$ ), 95% CI = [0.297, 0.832], reflecting the fact that thinking for pleasure was more meaningful than playing the video game, and that to the extent it was, participants enjoyed it more. The indirect effect of difficulty in concentrating was also significant,  $a_2b_2 = -0.060$  ( $SE = 0.035$ ), 95% CI = [-0.139, -0.006], reflecting the fact that participants found it more difficult to concentrate when thinking for pleasure than when playing the video game, and that to the extent they did, they found it less enjoyable.

Our second hypothesis was that the top path in Fig. 2—whereby thinking for pleasure is more enjoyable because it is more personally meaningful—would be moderated by participants' dispositional level of MLQ-P. Consistent with this prediction, participants high in MLQ-P

**The Trade-Off of Thinking for Pleasure (Raza et al., 2019)**



\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Fig. 2.** The Trade-Off of Thinking for Pleasure (Raza et al., 2019), \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

found thinking to be more meaningful than did participants low in MLQ-P,  $t(192) = 2.29$ ,  $P = 0.023$ . And there was a significant Condition (thinking vs. video game)  $\times$  MLQ-P interaction on enjoyment,  $t(192) = 2.05$ ,  $P = 0.042$ , reflecting the fact that participants high in MLQ-P enjoyed thinking more than did participants low in MLQ-P, but did not differ in how much they enjoyed the video game. To explore further the route by which MLQ-P influenced thought enjoyment, we repeated the mediation analysis depicted in Fig. 2, adding MLQ-P as a moderator of each mediator (using Model 7 in Hayes, 2013). As expected, MLQ-P significantly moderated the extent to which meaningfulness mediated the effects of condition on thought enjoyment,  $m = 0.064$  ( $SE = 0.040$ ), 95% CI = [0.002, 0.160], but did not moderate the extent to which difficulty in concentrating mediated the effects of condition on thought enjoyment,  $m = 0.026$  ( $SE = 0.025$ ), 95% CI = [-0.012, 0.089].

In sum, Raza et al.'s (2019) results provide initial support for the trade-off extension of our model of thinking for pleasure: Compared to playing a video game, it was more effortful, which makes it less enjoyable. But to the extent that people have personally meaningful thoughts, it is more enjoyable. And, participants dispositionally high in beliefs that life is meaningful were especially likely to be on the positive side of this trade-off.



## 5. WHEN PEOPLE THINK FOR PLEASURE, WHAT DO THEY THINK ABOUT?

But what, specifically, do people find meaningful and enjoyable to think about? In most of our studies, we asked participants, at the conclusion of the thinking period, to write down what they had been thinking about, resulting in over 6000 reports (in conditions in which participants were instructed to try to enjoy their thoughts). Some participants only wrote only a few words (e.g., “personal stuff,” “the items written on the cards”). Others, rather than reporting what they thought about, wrote meta-comments about the process of trying to enjoy their thoughts (e.g., “It was nice to reflect on some good memories,” “I found it hard to concentrate on the three things I listed on the paper”). Most participants, however, described the content of their thoughts, such as this person:

*At first I thought about riding horses out west. It was quite lovely. I was galloping and it was just me and the horse. It was warm and the sun was shin-*

*ing. Then I thought about laying on a sailboat reading and listening to music. It was just me and my boyfriend. It was really hot out and there were few clouds in the sky. The waves were smooth and a seagull flew overhead.*

We analyzed all reports (average length = 67 words) with the 2015 version of LIWC text analysis software (LIWC2015; Pennebaker, Booth, Boyd, & Francis, 2015). Table S4 in the Supplemental Materials displays the descriptive statistics for all LIWC variables. Here we report the categories that correlated with reported enjoyment  $> 0.10$  or less than  $-0.10$ , as well as the results of a regression including all eight of these variables entered simultaneously (see Table 1). Participants who enjoyed their thoughts wrote more, expressed more positive emotions and positive emotional tone, thought more about social topics, and were more likely to use the word “we,” such as this participant who reported very high enjoyment of the thinking period: “I was thinking about going camping with my husband and our dogs. I went fishing in the creek and caught us two huge large mouth bass to eat for dinner. My husband built us a fire and we cooked our fish. We ate the fish and gave some of it to our dogs.” People who enjoyed their thoughts also wrote more about drives, a category that includes words associated with affiliation, achievement, power, reward, and risk.

Lastly, enjoyment of thinking was correlated with clout, high scores on which suggest that “the author is speaking from the perspective of high expertise and is confident; low clout numbers suggest a more tentative, humble, even anxious style” (Pennebaker et al., 2015, p. 22). However, clout also includes interpersonal words such as “we,” “you,” and “social,” (Pennebaker, 2018), which may explain why it correlates with the enjoyment of thinking, given that we have found that people who think about interpersonal topics enjoy thinking more in some of our individual studies (Alahmadi et al., 2017), and that averaged across studies, the categories of “we” and “social” correlated with enjoyment of thinking (see Table 1).

As noted earlier, Alahmadi et al. (2017) found that people motivated to think for pleasure enjoyed it more. There we reported that this effect was significantly mediated by several LIWC categories, such as an increase in word count and social words. Table 1 reports the results of the same mediation analyses, except that these analyses include all participants across all studies who were either asked to enjoy their thoughts or to think about whatever they wanted. The results were generally consis-

**TABLE 1** Correlations, beta weights, and mediation analyses on LIWC variables predicting enjoyment of thinking.

LIWC variable	<i>r</i> with enjoyment of thinking <sup>a</sup>	<i>B</i> (SE)	Mediation analyses: Thinking no instructions (– 1) vs. Thinking for pleasure (+ 1)				
			<i>a</i> (SE)	<i>b</i> (SE)	<i>c</i> (SE)	<i>c'</i> (SE)	<i>ab</i> (SE) [95% CI]
Word count	0.136 <sup>d</sup>	0.004 <sup>d</sup> (0.000)	6.15 <sup>d</sup> (1.83)	0.004 <sup>d</sup> (0.0004)	0.577 <sup>d</sup> (0.057)	0.551 <sup>d</sup> (0.057)	0.026 (0.006) [0.015, 0.038]
Clout	0.139 <sup>d</sup>	0.004 <sup>c</sup> (0.002)	3.60 <sup>d</sup> (0.67)	0.012 <sup>d</sup> (0.0010)	0.577 <sup>d</sup> (0.057)	0.535 <sup>d</sup> (0.057)	0.043 (0.007) [0.029, 0.058]
Tone	0.278 <sup>d</sup>	0.008 <sup>d</sup> (0.001)	9.12 <sup>d</sup> (0.96)	0.016 <sup>d</sup> (0.0007)	0.577 <sup>d</sup> (0.057)	0.430 <sup>d</sup> (0.055)	0.147 (0.015) [0.118, 0.178]
We	0.133 <sup>d</sup>	0.057 <sup>c</sup> (0.018)	0.169 <sup>d</sup> (0.044)	0.172 <sup>d</sup> (0.0157)	0.577 <sup>d</sup> (0.057)	0.548 <sup>d</sup> (0.057)	0.029 (0.005) [0.019, 0.039]
Posemo-Negemo	0.222 <sup>d</sup>	0.027 <sup>d</sup> (0.006)	0.936 <sup>d</sup> (0.145)	0.086 <sup>d</sup> (0.0047)	0.577 <sup>d</sup> (0.057)	0.497 <sup>d</sup> (0.056)	0.080 (0.011) [0.060, 0.103]
Social	0.113 <sup>d</sup>	0.004 (0.006)	0.691 <sup>d</sup> (0.157)	0.042 <sup>d</sup> (0.004)	0.577 <sup>d</sup> (0.057)	0.548 <sup>d</sup> (0.057)	0.029 (0.006) [0.018, 0.042]
Drives	0.056 <sup>d</sup>	N/A	0.414 <sup>b</sup> (0.167)	0.019 <sup>d</sup> (0.004)	0.577 <sup>d</sup> (0.057)	0.569 <sup>d</sup> (0.057)	0.008 (0.003) [0.002, 0.016]
Work	– 0.101 <sup>d</sup>	– 0.009 (0.006)	– 0.973 <sup>d</sup> (0.113)	– 0.047 <sup>d</sup> (0.006)	0.577 <sup>d</sup> (0.057)	0.532 <sup>d</sup> (0.057)	0.045 (0.009) [0.030, 0.065]

**TABLE 1** (Continued)

LIWC variable	<i>r</i> with enjoyment of thinking <sup>a</sup>	<i>B</i> (SE)	Mediation analyses: Thinking no instructions (– 1) vs. Thinking for pleasure (+ 1)				
			<i>a</i> (SE)	<i>b</i> (SE)	<i>c</i> (SE)	<i>c'</i> (SE)	<i>ab</i> (SE) [95% CI]
Time	– 0.106 <sup>d</sup>	– 0.012 <sup>c</sup> (0.004)	– 0.553 <sup>d</sup> (0.165)	– 0.035 <sup>d</sup> (0.004)	0.577 <sup>d</sup> (0.057)	0.558 <sup>d</sup> (0.057)	0.020 (0.006) [0.009, 0.033]

Note. The sample size for the correlations and beta weights in Columns 2 and 3 is 6403. In the mediation analyses, *a* is the regression coefficient of condition on the mediator; *b* is the regression coefficient of the mediator on reported enjoyment, adjusted for condition; *c* is the regression coefficient of condition on enjoyment, and *c'* is the regression coefficient of condition on the enjoyment, adjusted for the mediator. The sample size for all mediation analyses was 6781. WC = number of words participants wrote. Clout and Tone are summary variables in the form of percentiles based on previous findings (see Pennebaker et al., 2015). The remainder of the variables are the percentages of the total number of words in each category. Overall model *R*<sup>2</sup> is based on the Nakagawa and Schielzeth (2013) approach.

<sup>a</sup>Conditions in which participants instructed to enjoy their thoughts.

<sup>b</sup>*P* < 0.05.

<sup>c</sup>*P* < 0.01.

<sup>d</sup>*P* < 0.001.



tent with those reported by Alahmadi et al. (2017). That is, when we asked people to entertain themselves with their thoughts (instead of to think whatever they wanted), they wrote more; were more likely to report thinking about social topics and drives (and to use the word “we”); more likely to express positivity, positive emotional tone, and greater clout; and less likely to report thinking about work and time (cf. Honeycutt, 2003). And to the extent that each of those was true, they enjoyed the thinking period more.



## 6. INDIVIDUAL AND CULTURAL DIFFERENCES

Earlier we mentioned people who found great solace in their thoughts, such as Edith Bone and Ronald Ridgeway, who retreated into their own minds in order to escape the horrors of imprisonment. And yet, many people find thinking for pleasure to be difficult and not very enjoyable. Are there personality or demographic variables that predict who will be in which camp?

Over the course of this research program, our participants completed many different individual difference measures. They completed some of these measures in the same sessions in which they were asked to think for pleasure, but more commonly they completed them earlier in the semester as part of an on-line pretest survey for the Department of Psychology participant pool, in which different researchers inserted various measures. The number of participants who completed each measure thus varies widely. Details of all measures and their respective sample sizes, and demographics for the entire sample, are reported in the supplementary materials (see Tables S5 and S6); we summarize the results here.

### 6.1. Demographics

Women and men enjoyed thinking equally,  $M_s = 5.50$  vs.  $5.46$  ( $SD_s = 2.03, 1.98$ ),  $b = -0.080$  ( $SE = 0.046$ ),  $t(7,136.45) = -1.76$ ,  $R_\beta^2 = 0.0004$  [ $-0.0008, 0.001$ ],  $P = 0.078$ . There was a weak tendency for participants to enjoy thinking more the older they were, regardless of whether we analyzed the entire sample,  $b = 0.018$  ( $SE = 0.003$ ),  $t(5,516.04) = 7.06$ ,  $R_\beta^2 = 0.01$  [ $0.004, 0.01$ ],  $P < 0.001$ ; only non-college students,  $b = 0.017$  ( $SE = 0.003$ ),  $t(2,956.00) = 5.99$ ,  $R_\beta^2 = 0.01$  [ $0.004, 0.02$ ],  $P < 0.001$ ; or college students alone,  $b = 0.027$  ( $SE = 0.011$ ),

$t(3,371.27) = 2.54$ ,  $R_{\beta}^2 = 0.002$   $[-0.001, 0.005]$ ,  $P = 0.011$ . Overall, older adults enjoyed thinking slightly more.

Why would older people enjoy thinking for pleasure more than younger people? Research finds that older adults have fewer “current concerns” than younger adults and enjoy cognitive tasks more (Maillet & Schacter, 2016), which suggests that they might show higher motivation to think for pleasure. Consistent with this view, age was positively correlated with the goal of thinking for pleasure in our studies,  $b = 0.02$  ( $SE = 0.003$ ),  $t(2,068.82) = 6.41$ ,  $R_{\beta}^2 = 0.02$   $[0.01, 0.04]$ ,  $P < 0.001$ . What about age and difficulty in concentrating on one's thoughts? Here the literature makes contrary predictions. Reduced cognitive resources theory ( Craik, 1986) argues that as people age, they have a reduced ability to inhibit task-unrelated thoughts, which might make it more difficult for them to think for pleasure while inhibiting unrelated thoughts. On the other hand, to the extent that older adults have fewer current concerns, they might find it easier to think for pleasure, because they have fewer competing thoughts. Our data support the latter hypothesis, in that older adults reported less difficulty in concentrating,  $b = -0.02$  ( $SE = 0.003$ ),  $t(3,216.21) = -6.10$ ,  $R_{\beta}^2 = 0.01$   $[0.005, 0.02]$ ,  $P < 0.001$ . Furthermore, the increased motivation to think for pleasure and the lowered difficulty in doing so jointly mediated the relation of age to the enjoyment of thinking: motivation to have pleasant thoughts  $ab = 0.010$   $[0.009, 0.012]$ , difficulty concentrating  $ab = 0.011$   $[0.010, 0.013]$ .

## 6.2. State variables

Enjoyment of thinking was significantly correlated with participants' reported positive affect at the beginning of the experimental session,  $b = 0.45$  ( $SE = 0.03$ ),  $t(6,545.90) = 15.39$ ,  $R_{\beta}^2 = 0.04$   $[0.03, 0.04]$ ,  $P < 0.001$ , and negatively correlated with how bored they said they were,  $b = -0.27$  ( $SE = 0.03$ ),  $t(6,544.25) = -8.71$ ,  $R_{\beta}^2 = 0.01$   $[0.006, 0.02]$ ,  $P < 0.001$ . It was not significantly correlated with participants' reported negative affect at the beginning of the experimental session,  $b = -0.02$  ( $SE = 0.04$ ),  $t(6,550.30) = -0.41$ ,  $R_{\beta}^2 = 0.00002$   $[-0.0006, 0.0004]$ ,  $P = 0.68$ . Given these results, it is all the more remarkable that people such as Edith Bone and Ronald Ridgeway were able to distract themselves with pleasurable thoughts while in prison, given that prison is not an environment conducive to frequent positive affect. Our research sug-

gests that Bone's and Ridgeway's mental escapes were the exception and not the rule.

### 6.3. Personality variables

As a rough estimate of which individual difference variables correlated with the enjoyment of thinking, we computed the Pearson correlations between each variable and enjoyment, collapsed across all studies. We then conducted mixed model analyses (with study as a random factor) on any variable that correlated with enjoyment greater than  $r = 0.20$  or less than  $r = -0.20$ . Earlier we reported the results of one of these variables, namely Need for Cognition (Cacioppo & Petty, 1982), which was significantly correlated with enjoyment of thinking,  $r = 0.24$ ;  $b = 0.43$  ( $SE = 0.03$ ),  $t(3,248.35) = 13.14$ ,  $R_{\beta}^2 = 0.05$  [0.03, 0.07],  $P < 0.001$ . We also presented evidence that another individual difference measure, Meaning of Life—Presence, moderated the effects of thinking for pleasure. The only other individual difference measures that met this criterion were items from subscales of the Imaginal Processes Inventory (Singer & Antrobus, 1963): Positive Daydreaming,  $r = 0.28$ ;  $b = 0.96$  ( $SE = 0.09$ ),  $t(1123.65) = 10.45$ ,  $R_{\beta}^2 = 0.09$  [0.06, 0.12],  $P < 0.001$  and participants' reported experience with meditation,  $r = 0.21$ ;  $b = 0.20$  ( $SE = 0.02$ ),  $t(4,676.83) = 9.00$ ,  $R_{\beta}^2 = 0.02$  [0.01, 0.02],  $P < 0.001$ . In other words, the higher participants were in the Need for Cognition and MLQ-P, the more they reported that they enjoyed daydreaming, and the greater their experience with meditation, the more they enjoyed thinking in our studies.

A number of other personality variables showed weak relations with enjoyment of thinking, such as openness to experience,  $r = 0.16$ ;  $b = 0.31$  ( $SE = 0.03$ ),  $t(4530.03) = 11.56$ ,  $R_{\beta}^2 = 0.03$  [0.02, 0.04],  $P < 0.001$ , and agreeableness,  $r = 0.09$ ,  $b = 0.18$  ( $SE = 0.03$ ),  $t(4412.57) = 6.59$ ,  $R_{\beta}^2 = 0.01$  [0.003, 0.02],  $P < 0.001$ . Equally notable were some of the individual difference measures that did *not* correlate highly (or at all) with enjoyment of thinking, such as depression measured with items from the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961),  $r = -0.10$ ;  $b = -0.19$  ( $SE = 0.06$ ),  $t(849.58) = -2.99$ ,  $R_{\beta}^2 = 0.01$  [-0.004, 0.02],  $P = 0.003$  or the DASS Depression Inventory (Lovibond & Lovibond, 1995),  $r = -0.05$ ;  $b = -0.01$  ( $SE = 0.012$ ),  $t(415) = 0.58$ ,  $R_{\beta}^2 = 0.001$  [-0.01, 0.01],  $P = 0.57$ ; subjective well-being (Diener, Emmons, Larsen, & Griffin, 1985),  $r = 0.13$ ,  $b = 0.17$  ( $SE = 0.04$ ),

$t(1603.53) = 4.49$ ,  $R_{\beta}^2 = 0.01$  [0.001, 0.02],  $P < 0.001$ ; the tendency to engage in rumination (Treyner, Gonzalez, & Nolen-Hoeksema, 2003),  $r = 0.08$ ;  $b = 0.21$  ( $SE = 0.15$ ),  $t(393.85) = 1.46$ ,  $R_{\beta}^2 = 0.01$  [- 0.01, 0.02],  $P = 0.15$ ; and scores on a scale of mindfulness (Brown & Ryan, 2003),  $r = 0.05$ ;  $b = 0.15$  ( $SE = 0.11$ ),  $t(696.36) = 1.40$ ,  $R_{\beta}^2 = 0.003$  [- 0.01, 0.01],  $P = 0.16$ .

#### 6.4. Cultural differences

Most of the research on intentional thinking for pleasure has been conducted with American participants, raising the question of whether there are cultural differences in how much people enjoy their thoughts. To examine this question, Buttrick et al. (2018) replicated Study 8 by Wilson et al. (2014) with over 2500 participants in 11 countries. In the original study, American college students randomly assigned to perform everyday solitary activities (e.g., watching a video, reading) reported much higher enjoyment than did college students randomly assigned to think for pleasure. Buttrick et al. replicated this study with college students in Belgium, Brazil, Costa Rica, Japan, South Korea, Malaysia, Portugal, Serbia, Turkey, the United Arab Emirates, and the United States. The original findings were replicated in every country: Participants who did solitary external activities reported significantly greater enjoyment than did participants who thought for pleasure. In addition, there was significant variation across the countries in the degree to which participants enjoying thinking. These differences, however, were fully accounted for by variation in five individual difference variables that varied across the countries. Four of these variables were positively correlated with thinking for pleasure (need for cognition, openness to experience, meditation experience, and initial positive affect) and one was negatively correlated (reported phone usage). When country-level differences in these variables were controlled, country-level differences in enjoyment of thinking were no longer significant. In short, the allure of external activities, such as reading or watching TV, over intentional thinking for pleasure, was strong throughout the world.



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## 7. THE VALUE OF THINKING FOR PLEASURE

In a famous short story by James Thurber (1939), a man named Walter Mitty lives a drab, hapless life. On his weekly trip into town he

accidentally enters a parking lot via the exit, to the ire of the attendant. His wife insists that he buy rubber overshoes because “You’re not a young man any longer.” He tries to remove snow chains from the tires of his car, only to wrap them around the axles. But these ordeals do not weigh on Mitty as much as they might, because he has discovered a way out of his humdrum existence: conjuring fantastical worlds inside his own mind. In the blink of an eye he is a revered surgeon who saves the life of a famous patient (after fixing a complicated surgical machine by replacing a broken piston with a fountain pen). A moment later he is a brazen World War II pilot volunteering for a daring mission to bomb a German ammunition dump. He lives happily in his own mind, brought back to reality only by prods from his wife or cries from irate parking lot attendants.

Surely, one might argue, Walter Mitty would be better off taking steps to improve his actual life—perhaps by locating the entrances (instead of the exits) to parking lots and learning how to properly remove tire chains—rather than escaping into his fantasy worlds. Indeed, as mentioned earlier, some people spend so much time fantasizing that they neglect their everyday needs and goals. Somer (2002; Bigelsen et al., 2016) argued that this phenomenon deserves its own clinical diagnosis called *maladaptive daydreaming*, defined as “extensive fantasy activity that replaces human interaction and/or interferes with academic, interpersonal, or vocational functioning” (Somer, 2002, p. 199). Many maladaptive daydreamers find their fantasy worlds to be quite alluring, while also recognizing their cost, such as this person quoted by Bigelsen et al. (2016): “It stops me from interacting in real world and real people. My relationship with family goes from fine to bad as I did not speak to them often because I would just lock myself in my room. . . . My school performance worsens. I can’t concentrate on studies. I skipped school a lot just to be in my world” (p. 255).

But maybe the ability to enjoy one’s thoughts is a useful mental tool that people could use profitably to reduce stress or enjoy the moment, as long as it did not take over their lives or become a compulsion. People often find themselves in boring or stressful circumstances over which they have little control, such as when they have nothing to do at work (which occurs surprisingly frequently; Brodsky & Amabile, 2018), are stuck in traffic jams, are waiting in line, or tossing and turning in bed,

unable to sleep. Perhaps, under these circumstances, it is beneficial to be able to deliberately enjoy one's thoughts.

Although there is little research on this question, there are two examples of empirically-established benefits of thinking for pleasure, one that found it helped insomniacs get to sleep and another that found it increased pain tolerance. Harvey and Payne (2002) recruited a sample of college students suffering from insomnia and randomly assigned them to follow one of three sets of instructions when they went to bed. Those in the imagery distraction condition were asked to “distract themselves by imagining a situation they found interesting and engaging, but also pleasant and relaxing,” and to spend 2 minutes, with their eyes closed, “imagining the scene they had chosen in as much detail as possible” (p. 270). Those in the general distraction condition were instructed to distract themselves “from thoughts, worries, and concerns” (p. 270), but were not given specific instructions about how to do so. Those in the control condition were instructed to do whatever they normally do when trying to get to sleep. The next morning, all participants recorded how long it had taken them to fall asleep. Participants in both the imagery distraction and general distraction conditions group reported getting to sleep significantly more quickly than did participants in the control condition.

A series of studies by Hekmat, Staats, Staats, and colleagues examined the effects of various kinds of fantasies on pain tolerance. Each study followed the same procedure: Participants were instructed to fantasize about various pleasurable topics while their hand was submerged in ice water. The topics included “happy moments in their lives” (Hekmat, Staats, & Staats, 2016, p. S103); “pre-rehearsed spiritual fantasies” (Hekmat, Staats, & Staats, 2006, p. S69); “romantic interactions with a soul mate” (Hekmat, Staats, Staats, & Diek, 2007, p. S55); “drinking their favorite beverage” (Hekmat, Staats, Staats, Kowolski, & Pommer, 2009, p. S66); and “eating their favorite meal” (Hekmat, Staats, & Staats, 2008, p. 58). In each study, there were two randomly-assigned control conditions: One in which participants were instructed to fantasize about neutral topics and another in which participants did not receive any instructions about what to think about. In all studies, participants instructed to think about pleasant topics (happy moments, spiritual thoughts, romantic partners, drinks, food) exhibited greater pain tolerance than did participants in the neutral fantasy or no instructions conditions.

Might there also be benefits to thinking for pleasure in everyday life, over the course of one's day? And if so, why? We conducted a field study to address these questions, and to compare thinking for pleasure more systematically to a different kind of thinking, namely planning for the future (Raza et al., 2019; see Study 36 in the supplemental materials).

### **7.1. Taking a thinking break**

Participants attended an initial laboratory session at which they received instructions and completed individual difference measures. They were told that on the following day they should make note of “down times,” defined as any time they were by themselves and had at least 2 minutes to do whatever they wanted, and to spend up to five of those down times either (a) entertaining themselves with their thoughts, (b) planning what they would be doing over the next 48 hours, or (c) doing what they normally do at such times (randomly assigned on a between-participants basis). Participants in the enjoy thoughts condition were given the goal of having a positive experience and were asked to do so by “thinking about pleasant, enjoyable topics.” Participants in the planning condition were given the goal of planning their activities over the next 48 hours, whereas participants in the normal day condition were asked to do whatever they typically do during down times. Participants in all three conditions wrote down prompts on index cards to remind them what to do during the down times. In the enjoy thoughts condition, for example, participants wrote down eight topics they would enjoy thinking about on  $3 \times 5$  index cards connected with a ring, one topic per card, which was identical to the thinking aid condition of the Westgate et al. (2017) studies discussed earlier. Participants in the planning condition wrote on the index cards eight activities they wanted to plan, whereas participants in the normal day condition wrote on the index cards activities they normally do during down times. Participants in all conditions were instructed to keep their index cards with them the following day. Whenever they had a down time, they were told to take out their index cards and perform the activity they had been instructed to do, using their cards as a guide (i.e., to enjoy their thoughts, plan, or do what they normally do, depending on their condition). Participants repeated this procedure for up to five down times the following day.

After each down time, participants rated their experience on five scales: how enjoyable the down time period had been, how boring it was,

how hard it had been to concentrate, how personally meaningful the down time experience was, and how worthwhile it was (all rated on 9-point scales). Participants also wrote down what they did during the down time and what they had thought about.

Participants appear to have taken the study seriously: They completed and rated an average of 4.46 down times ( $SD = 0.96$ ), with no significant differences between conditions,  $F(2, 160) = 2.24$ ,  $P = 0.11$ . Participants in the normal day condition spent a large proportion of their down times using electronic devices (49%). The next most frequent activities in this condition were thinking (14%), studying (6%), conversation (5%), walking/exercise (5%), and reading (3%). Participants in the enjoy thoughts condition spent most of their down times thinking (60%), followed by walking/exercise (17%), using electronic devices (4%), and showering (3%). (Note that participants in this condition could have been doing their assigned thinking activity while walking/exercising or showering.) Participants in the planning condition spent most of their time thinking (51%), followed by using electronic devices (16%), walking/exercise (10%), studying (5%), and showering (2%).

How much did people enjoy the down times, and how meaningful did they find them? As predicted, participants in the enjoy thoughts condition found the down times to be more personally meaningful than participants in either the planning or normal day conditions, which did not differ significantly from each other (see Table 2). Participants in the enjoy thoughts condition rated the down times as more enjoyable and less boring than did participants in the planning condition, though not significantly differently from participants in the normal day condition. There were also significant differences in how hard participants said it was to concentrate, with those in the enjoy thoughts and planning condition reporting more difficulty in concentrating than participants in the normal day condition. There were no significant differences in participants' reports of how worthwhile the down times were.

In short, participants' normal down time activities required the least effort (the least difficulty concentrating), and were somewhat enjoyable, but were not very personally meaningful. Engaging in planning was relatively effortful, boring, and not very enjoyable or meaningful. In contrast, thinking for pleasure was the most personally meaningful, though it was also more effortful than engaging in one's normal activities.

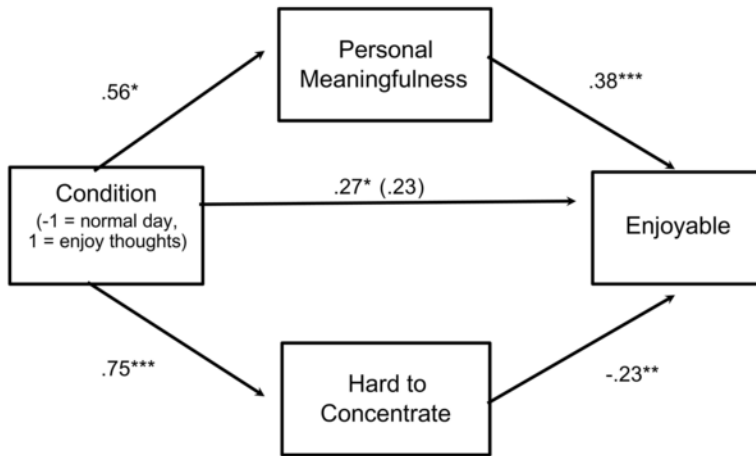


**TABLE 2** Average ratings of down times during the day by experimental condition.

Variable	Condition			
	Enjoy thoughts	Planning	Normal day	
Enjoy, daily ratings	<i>n</i>	53	45	63
	<i>SD</i>	1.19	1.48	1.39
	<i>M</i>	6.29 <sup>a</sup>	5.26 <sup>b</sup>	5.76 <sup>a,b</sup>
Boring, daily ratings	<i>n</i>	53	45	63
	<i>SD</i>	1.56	1.45	1.36
	<i>M</i>	3.64 <sup>a</sup>	4.57 <sup>b</sup>	3.63 <sup>a</sup>
Hard to concentrate, daily ratings	<i>n</i>	53	45	63
	<i>SD</i>	1.49	1.85	1.26
	<i>M</i>	4.33 <sup>a</sup>	4.62 <sup>a</sup>	2.82 <sup>b</sup>
Personally meaningful, daily ratings	<i>n</i>	53	45	63
	<i>SD</i>	1.49	1.38	1.63
	<i>M</i>	5.74 <sup>a</sup>	4.38 <sup>b</sup>	4.62 <sup>b</sup>
Worthwhile, daily ratings	<i>n</i>	53	45	63
	<i>SD</i>	1.45	1.37	1.47
	<i>M</i>	5.39 <sup>a</sup>	5.08 <sup>a</sup>	5.42 <sup>a</sup>

Note. Means with different superscripts differ at  $P < 0.05$  with a Bonferroni post hoc test

The results of the “thinking break” study are consistent with our trade-off model: Compared to participants in the normal day condition, those in the enjoy thoughts condition reported that their down times were more personally meaningful, but also that it had been harder to concentrate during the down times. To test this trade-off, we conducted the same mediation analysis as reported in Fig. 2. As predicted, and as seen in Fig. 3, participants in the enjoy thoughts condition rated the down times as more personally meaningful than participants in the normal day condition, and to the extent they did, they found them more enjoyable: The indirect effect of personal meaningfulness on enjoyableness was significant,  $ab = 0.21$ ,  $SE = 0.08$ ,  $[0.09, 0.39]$ . However, there was also a significant indirect effect of difficulty in concentrating,  $ab = -0.17$ ,  $SE = 0.06$ ,  $[-0.31, -0.07]$ , indicating that participants in the enjoy thoughts condition also found it harder to concentrate during the down times, and to the extent they did, they found them less enjoyable. These results are fully consistent with the trade-off model we presented earlier: When people are motivated to think for pleasure, they will succeed to the extent that they find their thoughts to be personally meaningful, though

**The Trade-Off Model Revisited**

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Fig. 3.** The Trade-Off Model Revisited \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

to the extent they find it difficult to concentrate on their thoughts, the affective benefits will be diminished. In other words, the difficulty of thinking for pleasure partially suppresses the potential boost to enjoyment people would otherwise receive by thinking about topics that feel meaningful.

When will this trade-off be worth it? Some evidence suggests that even when people know that they will enjoy an activity, they will still avoid it if it involves too much effort (Schiffer & Roberts, 2017). This may explain why people spend so little time thinking for pleasure during their daily lives and so much time with electronic devices and other external activities—the latter are simply easier and less demanding. It is also possible, however, that people do not fully appreciate the benefits of thinking for pleasure (Alahmadi et al., 2017). For example, they may underestimate how personally meaningful they would find it. If so, then people who have tried thinking for pleasure and experienced it first-hand might better recognize its benefits and be more likely to engage in that kind of thinking in the future. Consistent with this idea, participants in the enjoy thoughts condition of the Raza et al. (2019) “thinking break” study were significantly more likely to predict, at the end of the study, that they would enjoy thinking for pleasure in the future than were participants in the normal day condition.

The results in the enjoy thoughts condition, on the face of it, might seem to conflict with previous findings that people asked to think for pleasure reported much lower enjoyment than people asked to engage in an enjoyable external activity such as watching a video or reading (Buttrick et al., 2018; Wilson et al., 2014, Study 8). Why was thinking for pleasure found to be as enjoyable as normal day activities in the “thinking break” study, when it was found to be much less enjoyable than engaging in external activities in previous studies? There are at least three possible reasons: First, participants in the enjoy thoughts condition of the “thinking break” study were given “thinking aids” that have been shown to increase enjoyment of thinking (Westgate et al., 2017), whereas participants in the enjoy thoughts condition of the previous studies were not. Second, participants could incorporate the thinking exercises into their everyday lives, which may have been easier than having to do it “on demand” in a laboratory session, by allowing them to pick moments conducive to thinking. Third, participants in the “external engagement” conditions of the previous studies were explicitly asked to pick activities that they would enjoy doing, whereas participants in the normal day condition of the “thinking break” study were asked to do whatever they normally do. The latter participants may have had goals other than enjoyment for at least some of their down times; for example, they spent 6% of their down times studying and 2% tidying or cleaning. Thus, the previous studies held constant the goal to have an enjoyable experience, to see how thinking compared to engaging in other pleasurable but external activities, and the answer was clear: People enjoyed the external activities more. The “thinking break” study examined how people spend their spare moments on a typical day, and whether there were benefits to getting them to think for pleasure (with thinking aids) instead of their normal activities.

The results in the planning condition were quite different. Recall that participants in Alahmadi et al. (2017) forecasted that planning would be a more meaningful and worthwhile use of their time than thinking for pleasure. That was not the case in the “thinking break” study. Participants found planning to be boring (compared to the enjoy thoughts and normal day conditions), unenjoyable and lacking in personal meaning (compared to the enjoy thoughts condition), and effortful (compared to the normal day condition). In other words, planning had the downside of thinking for pleasure, in terms of being effortful (cf. Sjästad & Baumeister, 2018),

but none of the benefits, in terms of meaning or enjoyment. Further, when we asked participants how enjoyable it would be to engage in various activities in the future, those in the enjoy thoughts condition rated thinking for pleasure *higher* than did participants in the other two conditions, whereas participants in the planning condition rated planning *lower* than did participants in the other two conditions. In other words, participants in the enjoy thoughts condition found their activity to be worth repeating, whereas participants in the planning condition found their activity not worth repeating.

It is possible, of course, that engaging in planning had unmeasured benefits. Thinking about what they need to get done, for example, might have made them better prepared to accomplish those things. Interestingly, though, participants in the planning *and* enjoy thoughts condition reported that they felt better prepared to do what they needed to do over the next 48 hours, compared to participants in the normal day condition. Whether participants actually were better prepared, however, is unknown.

In sum, the results of the “thinking break” study suggest that (a) there are costs and benefits to thinking for pleasure, in that it is effortful but also high in personal meaning (consistent with the trade-off model); and (b) there were no observed benefits of planning, at least of the kind participants did during their down times, and that we measured. These findings raise several questions about the generalizability of the results and their relevance to other literatures, to which we now turn.

## **7.2. Thinking for pleasure vs. positive fantasies and mental contrasting**

Studies by Oettingen and colleagues have found that writing about achieving a desired goal can have detrimental effects, by making people feel they have already achieved the goal and thus reduce efforts to actually pursue it (Oettingen, 2012; Oettingen & Reiningger, 2016). In one study, for example, participants in a positive fantasy condition were asked to imagine that everything they did in the upcoming week turned out very well and to write down the positive thoughts and daydreams that occurred to them. Participants in the neutral control condition also wrote down their thoughts and daydreams about the upcoming week, but were not directed to think only about positive outcomes (Kappes & Oettingen, 2011, Study 3). All participants returned a week later and reported how

their week had actually gone. As predicted, participants in the positive fantasy condition reported, at the second session, that their week had not gone as well as participants in the control condition. And, this reduced satisfaction was mediated by significantly lower reported energization immediately after participants initially wrote about their fantasies, which is consistent with the idea that fantasizing about positive events demotivates people, because at some level they feel that they have already obtained what they are fantasizing about.

In other studies, Oettingen and colleagues have found that the detrimental effects of writing about desired outcomes can be avoided—and indeed, produce beneficial effects—if people engage in *mental contrasting*, whereby they first fantasize about positive outcomes but then write down specific steps that still need to be taken to achieve their goals (Oettingen, 2012; Oettingen & Reininger, 2016). In one study, for example, participants interested in losing weight were asked to think about a specific dieting goal they would like to accomplish over the next 2 weeks. Those in the positive fantasy condition were asked to write about two positive consequences of achieving their goal, whereas those in the mental contrasting condition were asked to write about one positive consequence of achieving their goal and one obstacle that might prevent them from achieving it. Participants in the control condition did not engage in any writing exercises. Two weeks later participants returned and reported how successful they had been in achieving their dieting goals. As predicted, those in the mental contrasting condition reported greater success than did participants in either the positive fantasy or control conditions, who did not differ from each other. For example, participants in the mental contrasting condition reported eating foods with fewer calories than did the other participants (Johannessen, Oettingen, & Mayer, 2012). In Oettingen and Reininger's (2016) words, “positive future fantasies need to be complemented with a clear sense of reality” (p. 594).

Because the procedures followed in Oettingen et al.'s studies and our studies of thinking for pleasure differed in a number of ways, it is not easy to compare them. Participants in Oettingen et al.'s studies, for example, wrote down their thoughts and plans, whereas participants in our studies engaged in thinking alone. The purpose of Oettingen et al.'s studies was to examine the effects of different kinds of thought on future goal regulation, whereas the purpose of our studies was to examine the effects of thinking in the moment. Nonetheless, the Oettingen et al. studies sug-

gest a cautionary note about thinking for pleasure: To the extent that people focus solely on accomplishing desired goals, with no consideration of how to do so, they may become less likely to achieve those goals.

### **7.3. Thinking for pleasure vs. other approaches to increasing well-being**

There has been a considerable amount of research on how people regulate positive emotions (e.g., Folkman & Moskowitz, 2000; Gross, Richards, & John, 2006; Koole, 2009; Tamir, 2016; Tugade & Fredrickson, 2007), though little, until now, on how well people can do so with conscious thought alone (i.e., without writing anything down). Perhaps most relevant is the literature on the benefits of meditation. There has been an explosion of research on the effects of meditation on a variety of outcomes, including emotions, cognitions, and health (e.g., Creswell, 2017; Galante, Galante, Bekkers, & Gallacher, 2014; Hart, Ivrtzan, & Hart, 2013; Sedlmeier et al., 2012; Tang, Hölzel, & Posner, 2015; Walsh & Shapiro, 2006). This literature is difficult to summarize because it involves many different types of meditation and different operationalizations of each type (Goleman & Davidson, 2017). Perhaps the closest approach to our studies of thinking for pleasure is kindness-based meditation, including compassion and loving-kindness techniques, in which people focus on developing a “loving acceptance feeling toward all sentient beings” (Galante et al., 2014, p. 1101; see also Hofmann, Grossman, & Hinton, 2011). This type of meditation typically involves structured exercises in which people are directed to feel compassion toward others, often by repeating phrases such as, “I wish you peace and joy” (Galante et al., 2014, p. 1102).

Our approach to thinking for pleasure differs from kindness-based meditation and other approaches (e.g., mindfulness meditation) in two main respects: (a) in our studies, people do not receive any training in how to think, whereas in most studies of meditation, people do (sometimes for several weeks, e.g., 6 weeks in Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008); (b) many forms of meditation stress “quieting the mind,” whereas, in our studies, people are encouraged to actively think. In other words, unlike the literature on meditation, we are interested in the extent to which people can enjoy their own thoughts for brief periods of time with little or no training.

Other studies have tested ways of increasing people's well-being over the long run with a variety of psychological interventions (Quoidbach, Mikolajczak, & Gross, 2015), including savoring, reminiscing, imagining one's best possible self, and expressing gratitude. In contrast to our studies, all of these approaches involve more than just thinking. Studies of savoring, for example, typically ask participants to engage in activities such as talking with others about positive experiences and focusing on positive events as they experience them (e.g., Bryant & Veroff, 2007; Jose, Lim, & Bryant, 2012). Other studies involve writing exercises, guided imagery, showing people photographs, or asking people to repeat phrases, rather than examining the role of thought alone (e.g., Davis et al., 2016; Hutcherson, Seppala, & Gross, 2008; King, 2001; Pinquart & Forstmeier, 2012; Quoidbach, Wood, & Hansenne, 2009; Sheldon & Lyubomirsky, 2006; Zeng, Chiu, Wang, Oei, & Leung, 2015). In contrast, our studies have examined the effects of using one's mind with little or no training, in the absence of writing or any engagement with the external world.

Another way of describing the differences between our approach and these others is to point out that they have different goals. The aforementioned studies of meditation and other ways of increasing well-being are more ambitious in some ways, in that they were designed to bring about long-term changes in happiness and, in some cases, to reduce depression. The goal of our studies was more modest, in some respects, namely to examine the extent to which people can retreat into their own minds to have positive experiences in the moment, such as feelings of enjoyment and personal meaningfulness. Though less ambitious, perhaps, this goal is not unimportant, because people often find themselves in stressful or boring situations, such as when they are on long commutes, waiting in line, or enduring boring colloquia. Our research suggests that making the effort to enjoy one's thoughts can be pleasurable and meaningful in such situations, particularly with small "thinking aids" that make it easier to do. Further, our goal is to understand not only the practical benefits of thinking for pleasure, but also to investigate a potentially overlooked function of conscious thought and increase our understanding of why people so rarely use it as a route to improving their moods.

#### 7.4. Thinking for pleasure and device obsession

If thinking for pleasure is beneficial, why don't people choose to do it more often? One reason, as we have seen, is that it requires effort, and people might not want to expend it (Schiffer & Roberts, 2017). Another possibility, also discussed earlier, is that people may have other priorities, such as spending time planning instead of trying to think enjoyable thoughts. A third possibility is that even though people recognize and value the benefits of "just thinking," there is often an alluring alternative that is too difficult to resist: electronic devices such as smartphones.

The pros and cons of electronic devices have been much debated, though one thing is clear: People spend a lot of time using them. The average American adult spends > 11 hours a day on electronic devices (Nielsen, 2018). Ninety-seven percent of American adolescents have access to at least one electronic device (Hysing et al., 2015), and they spend more time consuming media (an average of 9 hours a day) than they do sleeping (Common Sense Census, 2015). Fifty percent of American teenagers report that they are addicted to their mobile devices ("Dealing with Devices," 2016), and 1 in 10 adults report that they have used their phones while showering or having sex ("Americans Can't Put Down Their Smartphones," 2013). Visitors to college campuses quickly learn to dodge students who are staring down at their phones like zombies with little regard for what lies ahead. Perhaps, then, people's unwillingness to spend much time "just thinking" is because there is such an addictive alternative.

It is not difficult, however, to find similar laments throughout the ages, namely that people are too busy and do not spend enough time in contemplation. Over 500 years ago, the Dominican archbishop of Florence, Antonino wrote:

*It is impossible for many, indeed for almost all, human beings to enjoy the peace and quiet of a tranquil spirit, unless one creates for oneself some secret and hidden retreat in the mind, to which the irritations of business, the anxieties of responsibility, and the disquiet of all external occupations do not penetrate, and where, when it has finished with a host of undertakings, the mind, stripped immediately of all passions, can at once fly.*

*Quoted in Webb (2007, p. 10)*

Thus, the reluctance to spend time solely with one's thoughts may not be a new problem.



Nonetheless, the problem seems to be getting worse with the increase in tempting alternatives. Several pundits have warned about pernicious effects of device obsession (e.g., Carr, 2011; Wayne, 2016). A school principal in Washington D.C. offered to pay her students \$100 apiece if they could spend just one day a week, during the summer, free of electronic devices (Matos, 2017). But surely electronic devices have many benefits. Our purpose here is not to debate the overall value of electronic devices, but rather to see whether there is a relation between device usage and enjoyment of thinking. For example, is it possible that dependence on devices makes it more difficult to think for pleasure?

Although there is no direct evidence for or against this hypothesis, we note that in our combined dataset, there is a weak but significant negative correlation between the self-reported frequency of smartphone use and enjoyment of thinking,  $b = -0.13$ , ( $se = 0.03$ ),  $t(3529.90) = -4.25$ ,  $R_{\beta}^2 = 0.005$  [ $-0.0002, 0.01$ ],  $P < 0.001$ . This association remains significant when adjusted for age and education,  $b = -0.10$ , ( $se = 0.03$ ),  $t(3294.51) = -2.96$ ,  $R_{\beta}^2 = 0.003$  [ $-0.001, 0.006$ ],  $P = 0.003$ . Further, as noted earlier, Buttrick et al. (2018) found that residents of different countries reported significantly different levels of phone usage, and the more phone usage they reported, the less they enjoyed thinking.

This is a correlational finding, of course, and a weak one at that. We thus can't say for sure whether phone usage impedes thinking for pleasure, whether people who dislike thinking for pleasure are more likely to use their phones, or whether there is a third variable that predicts both of these variables. It is a provocative possibility, however, that the allure of the ever-present smartphone is reducing the amount of time that people spend thinking. Perhaps people should consider Powers' (2010) suggestion that everyone should create a "Walden Zone" in their homes that is conducive to contemplation and free of all electronic devices.



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## 8. SUMMARY AND FUTURE DIRECTIONS

We began by quoting Milton's verse that the mind "Can make a Heav'n of Hell, a Hell of Heav'n." Consistent with this view, we have seen that intentional thinking for pleasure does not come easily to most people, but can be enjoyable and beneficial under the right conditions. Specifically, we found evidence that intentional thinking for pleasure requires both motivation and the ability to concentrate. When both of these

conditions are met, people are able to enjoy thinking, particularly if they find their thoughts to be personally meaningful. But this involves a trade-off, because thinking for pleasure requires more concentration than other kinds of thinking (e.g., undirected thinking, planning) and more concentration than engaging in some external activities (e.g., playing a video game). And to the extent it does, it is less enjoyable.

There are many unanswered questions about thinking for pleasure, two of which we will mention here. First, it would be interesting to explore whether people enjoy thinking more when given goals other than enjoyment, such as thinking about meaningful topics. We have found that the more people rate their thoughts as personally meaningful, the more they enjoy thinking (see Figs. 2 and 3), and yet there may be some people who are unaware of this connection and thus choose to think of more prosaic matters. If so, then direct instructions to focus on things that are personally meaningful might make the experience more enjoyable.

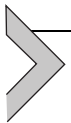
Second, there has been little attention to what people think *about* their thoughts when they attempt to think for pleasure. Research has found that metacognitive judgments about one's thoughts can influence how impactful those thoughts are (Briñol et al., 2018; Petty, Briñol, Tormala, & Wegener, 2007). In one study, for example, participants wrote down either negative or positive thoughts about their own bodies (Briñol, Gascó, Petty, & Horcajo, 2013). As expected, this writing exercise influenced participants' overall opinions of their bodies: When they focused on negative thoughts, they had a more negative overall opinion than when they focused on positive thoughts. Unless, that is, they were in a condition in which they could distance themselves from their own thoughts. In that condition, after writing down their thoughts, the researchers asked participants to discard what they had written into a trash can, with the hypothesis that doing so would create a psychological distance from their thoughts, reducing their impact. Consistent with this hypothesis, in this condition, participants' opinions of their own bodies were not influenced by what they had written. In a subsequent study, participants were more likely to be influenced by what they had written when they were asked to fold the page on which they had written their thoughts and put it in their pocket, wallet, or purse, presumably because this created a sense of psychological closeness to their thoughts. It would be interesting to see whether similar metacognitive manipulations influ-

ence the impact of thoughts people bring to mind when they think for pleasure, or how personally meaningful they find those thoughts to be.

It also remains to be seen if, and when, people are willing to make the trade-off we have documented: accepting the costs of expending effort in order to gain the benefits of thinking for pleasure. The “thinking break” intervention study reported here was a first step in that direction, indicating that people asked to think for pleasure in their everyday lives were able to do so and found it to be relatively enjoyable and meaningful. And, the participants in the thinking condition said they were especially likely to enjoy this activity in the future, compared to participants in the normal day and planning conditions. Whether they opted to think for pleasure after the study ended, however, is unknown. It may take more than a few tries for people to be willing to put aside their devices and exert the effort to enjoy their thoughts. But if people are willing to try, they may profit from David Thoreau's advice to “Be a Columbus to whole new continents and worlds within you, opening new channels, not of trade, but of thought” (Thoreau, 1854/2009, p. 158).

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## APPENDIX

Supplemental materials can be found at: <https://osf.io/t856x/>. The complete data set, SPSS syntax file, variable manual, and Qualtrics files that were used to run many of the studies are available upon request.

## REFERENCES

- Alahmadi, S., Buttrick, N.R., Gilbert, D.T., Hardin, A.M., Westgate, E.C., Wilson, T.D., 2017. You can do it if you really try: The effects of motivation on thinking for pleasure. *Motivation and Emotion* 41, 545–561.
- Albarracín, D., Sunderrajan, A., Dai, W., White, B.X., 2019. The social creation of action and inaction: From concepts to goals to behaviors. In: Olson, J.M. (Ed.), *Advances in experimental social psychology*. Vol. 59, Academic Press, San Diego, CA, pp. 2–233.
- American Time Use Survey Activity Lexicon, 2012. Retrieved March 2, 2015 from: <http://www.bls.gov/tus/lexiconwex2012.pdf>.

- Antrobus, J.S., 1968. Information theory and stimulus-independent thought. *British Journal of Psychology* 59, 423–430. <https://doi.org/10.1111/j.2044-8295.1968.tb01157.x>.
- Americans Can't Put Down Their Smartphones, Even During Sex. (2013, July 11). *Jumio*. Retrieved September 30, 2016 from: <http://www.marketwired.com/press-release/americans-cant-put-down-their-smartphones-even-during-sex-1810219.htm>
- Aurelius, M., 2005. In: Staniforth, M. (Ed.), *Meditations*. Penguin, New York, 121–181. trans..
- Baars, B.J., 1997. *In the theater of consciousness: The workspace of the mind*. Oxford University Press, New York, NY.
- Baird, B., Smallwood, J., Mrazek, M.D., Kam, J.W.Y., Franklin, M.S., Schooler, J.W., 2012. Inspired by distraction: Mind wandering facilitates creative incubation. *Psychological Science* 23, 1117–1122.
- Baumeister, R.F., Masicampo, E.J., 2010. Conscious thought is for facilitating social and cultural interactions: How mental simulations serve the animal–culture interface. *Psychological Review* 117, 945–971.
- Baumeister, R.F., Masicampo, E.J., Vohs, K.D., 2015. Conscious thoughts and the causation of behavior. E. Borgida, & J. Bargh (Assoc. Eds.), Mikulincer, M., Shaver, P. (Eds.), *APA handbook of personality and social psychology: Vol. 1. Attitudes and social cognition*. American Psychological Association, Washington, DC, pp. 231–250.
- Baumeister, R.F., Vohs, K.D., Aaker, J.L., Garbinsky, E.N., 2013. Some key differences between a happy life and a meaningful life. *The Journal of Positive Psychology* 8, 505–516.
- Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., Erbaugh, J., 1961. An inventory for measuring depression. *Archives of General Psychiatry* 4, 561–571.
- Bigelsen, J., Lehrfeld, J.M., Jopp, D.S., Somer, E., 2016. Maladaptive daydreaming: Evidence for an under-researched mental health disorder. *Consciousness and Cognition* 42, 254–266.
- Bone, E., 1966. *Seven years solitary*. Bruno Cassierer, Berlin.
- Briñol, P., Gascó, M., Petty, R.E., Horcajo, J., 2013. Treating thoughts as material objects can increase or decrease their impact on evaluation. *Psychological Science* 24, 41–47.
- Briñol, P., Petty, R.E., Stavraki, M., Lamprinakos, G., Wagner, B., Díaz, D., 2018. Affective and cognitive validation of thoughts: An appraisal perspective on anger, disgust, surprise, and awe. *Journal of Personality and Social Psychology* 114, 693–718.
- Brodsky, A., Amabile, T.M., 2018. The downside of downtime: The prevalence and work pacing consequences of idle time at work. *Journal of Applied Psychology* 103, 496–512.
- Brown, K.W., Ryan, R.M., 2003. The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology* 84, 822–848.
- Bryant, F.B., Veroff, J., 2007. *Savoring: A new model of positive experience*. Lawrence Erlbaum Associates, Mahwah, NJ.
- Bugnyar, T., Heinrich, B., 2005. Ravens, *Corvus corax*, differentiate between knowledgeable and ignorant competitors. *Proceedings of the Royal Society of London B: Biological Sciences* 272, 1641–1646.
- Buttrick, N.R., Choi, H., Wilson, T.D., Oishi, S., Boker, S.M., Gilbert, D.T., ... Wilks, D.C., 2018. Cross-cultural consistency and relativity in the enjoyment of thinking

- versus doing. *Journal of Personality and Social Psychology* <https://doi.org/10.1037/pspp0000198>.
- Cacioppo, J.T., Petty, R.E., 1982. The need for cognition. *Journal of Personality and Social Psychology* 42, 116–131.
- Camerer, C.F., Dreber, A., Holzmeister, F., Ho, T., Huber, J., Johannesson, M., ... Wu, H., 2018. Evaluating the replicability of social science experiments in nature and science. *Nature Human Behavior* 2, 637–644.
- Carr, N., 2011. *The shallows: What the internet is doing to our brains*. W. W. Norton, New York.
- Choi, J., Catapano, R., Choi, I., 2017. Taking stock of happiness and meaning in everyday life: An experience sampling approach. *Social Psychological and Personality Science* 8, 641–651.
- Christoff, K., Irving, Z.C., Fox, K.C., Spring, R.N., Andrews-Hanna, J.R., 2016. Mind-wandering as spontaneous thought: A dynamic framework. *Nature Reviews Neuroscience* 17, 718–731.
- Common Sense Census, 2015. Media use by tweens and teens. Retrieved June 21, 2017 from: <https://www.commonsensemedia.org/research/the-common-sense-census-media-use-by-tweens-and-teens>.
- Craik, F.I.M., 1986. A functional account of age differences in memory. In: Friedhart, K., Hagnendorf, H. (Eds.), *Human memory and cognitive capabilities: Mechanisms and performances*. Elsevier, Amsterdam, pp. 409–422.
- Creswell, J.D., 2017. Mindfulness interventions. *Annual Review of Psychology* 68, 491–516.
- Crick, F., Koch, C., 1990. Toward a neurobiological theory of consciousness. *Seminars in the Neurosciences* 2, 263–275.
- Critcher, C.R., Gilovich, T., 2010. Inferring attitudes from mindwandering. *Personality and Social Psychology Bulletin* 36, 1255–1266.
- Davis, D.E., Choe, E., Meyers, J., Wade, N., Varjas, K., Gifford, A., Quinn, A., Hook, J.N., Van Tongeren, D.R., Griffin, B.J., Worthington Jr., E.L., 2016. Thankful for the little things: A meta-analysis of gratitude interventions. *Journal of Counseling Psychology* 63, 20–31.
- Dealing with Devices: The Parent-Teen Dynamic, 2016. Common sense media. Retrieved September 23, 2016 from <https://www.commonsensemedia.org/technology-addiction-concern-controversy-and-finding-balance-infographic>.
- Dehaene, S., Charles, L., King, J.-R., Marti, S., 2014. Toward a computational theory of conscious processing. *Current Opinion in Neurobiology* 25, 76–84.
- Diaz, B.A., Van Der Sluis, S., Moens, S., Benjamins, J.S., Migliorati, F., Stoffers, D., ... Boomsma, D.I., 2013. The Amsterdam Resting-State Questionnaire reveals multiple phenotypes of resting-state cognition. *Frontiers in Human Neuroscience* 7, 446.
- Dickenson, E., . *The complete poems of Emily Dickenson, 1960*. Little, Brown, Boston.
- Diener, E., Emmons, R.A., Larsen, R.J., Griffin, S., 1985. The satisfaction with life scale. *Journal of Personality Assessment* 49, 71–75.
- Flanagan, O., 1992. *Consciousness reconsidered*. MIT Press, Cambridge, MA.
- Folkman, S., Moskowitz, J.T., 2000. Positive affect and the other side of coping. *American Psychologist* 55, 647–654.

- 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* 27, 583. <https://doi.org/10.3389/fpsyg.2013.00583>.
- Fredrickson, B.L., Cohn, M.A., Coffey, K.A., Pek, J., Finkel, S.M., 2008. Open hearts build lives: Positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology* 95, 1045–1062.
- Gable, S.L., Hopper, E.A., Schooler, J.W., 2019. When the muses strike: Creative ideas of physicists and writers routinely occur during mind wandering. *Psychological Science* 30, 396–404.
- Galante, J., Galante, I., Bekkers, M., Gallacher, J., 2014. Effect of kindness-based meditation on health and well-being: A systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology* 82, 1101–1114.
- Giambra, L.M., 1989. Task-unrelated thought frequency as a function of age: A laboratory study. *Psychology and Aging* 4, 136–143. <https://doi.org/10.1037/0882-7974.4.2.136>.
- Giambra, L.M., 1995. A laboratory method for investigating influences on switching attention to task-unrelated imagery and thought. *Consciousness and Cognition* 4, 1–21.
- Gilbert, D.T., 1991. How mental systems believe. *American Psychologist* 46, 107–119.
- Goleman, D., Davidson, R.J., 2017. *Altered traits: Science reveals how meditation changes your mind, brain, and body*. Avery, New York.
- Gross, J.J., Richards, J.M., John, O.P., 2006. Emotion regulation in everyday life. In: Snyder, D.K., Simpson, J.A., Hugues, J.N. (Eds.), *Emotion regulation in couples and families: Pathways to dysfunction and health*. American Psychological Association, Washington, DC, pp. 13–35. <https://doi.org/10.1037/11468-001>.
- Hart, R., Ivtzan, I., Hart, D., 2013. Mind the gap in mindfulness research: A comparative account of the leading schools of thought. *Review of General Psychology* 17, 453–466.
- Harvey, A.G., Payne, S., 2002. The management of unwanted pre-sleep thoughts in insomnia: Distraction with imagery versus general distraction. *Behaviour Research and Therapy* 40, 267–277.
- Havermans, R.C., Vancleef, L., Kalamatianos, A., Nederkoorn, C., 2014. Eating and inflicting pain out of boredom. *Appetite* 85, 52–57.
- Hayes, A.F., 2013. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford, New York.
- Hekmat, H., Staats, P., Staats, A., 2006. Do spiritual fantasies facilitate coping with acute pain. *The Journal of Pain* 7, S69.
- Hekmat, H., Staats, P., Staats, A., 2008. Do food fantasies facilitate coping with acute pain?. *The Journal of Pain* 9 (Suppl. 2), 58.
- Hekmat, H., Staats, P., Staats, A., 2016. Do happy fantasies facilitate coping with acute pain?. *The Journal of Pain* 17, S103.
- Hekmat, H., Staats, P., Staats, A., Diek, J., 2007. Do romantic fantasies facilitate coping with acute pain. *The Journal of Pain* 8, S55.
- Hekmat, H., Staats, P., Staats, A., Kowolski, C., Pommer, T., 2009. Do drinking fantasies facilitate coping with acute pain?. *The Journal of Pain* 10, S66.

- Hofmann, S.G., Grossman, P., Hinton, D.E., 2011. Loving-kindness and compassion meditation: Potential for psychological interventions. *Clinical Psychology Review* 31, 1126–1132.
- Honeycutt, J.M., 2003. *Imagined interactions*. Hampton, Cresskill, NJ.
- Hsee, C.K., Yang, A.X., Wang, L., 2010. Idleness aversion and the need for justifiable busyness. *Psychological Science* 21, 926–930.
- Hutcherson, C.A., Seppala, E.M., Gross, J.J., 2008. Loving-kindness meditation increases social connectedness. *Emotion* 8, 720–724.
- Hysing, M., Pallesen, S., Stormark, K.M., Jakobsen, R., Lundervold, A.J., Siversten, B., 2015. Sleep and use of electronic devices in adolescence: Results from a large population-based study. *BMJ Open* 5, e006748 <https://doi.org/10.1136/bmjopen-2014-006748>.
- Inzlicht, M., Shenhav, A., Olivola, C.Y., 2018. The effort paradox: Effort is both costly and valued. *Trends in Cognitive Sciences* 4, 337–349.
- Janik, V.M., Sayigh, L.S., Wells, R.S., 2006. Signature whistle shape conveys identity information to bottlenose dolphins. *Proceedings of the National Academy of Sciences of the United States of America* 103, 8293–8297.
- Johannessen, K.B., Oettingen, G., Mayer, D., 2012. Mental contrasting of a dieting wish improves self-reported health behaviour. *Psychology and Health* 27 (Suppl. 2), 43–58.
- Jose, P.E., Lim, B.T., Bryant, F.B., 2012. Does savoring increase happiness? A daily diary study. *The Journal of Positive Psychology* 7, 176–187.
- Kappes, H.B., Oettingen, G., 2011. Positive fantasies about idealized futures sap energy. *Journal of Experimental Social Psychology* 47, 719–729.
- Killingsworth, M.A., Gilbert, D.T., 2010. A wandering mind is an unhappy mind. *Science* 330, 932.
- King, L.A., 2001. The health benefits of writing about life goals. *Personality and Social Psychology Bulletin* 27, 798–807.
- King, L.A., Heintzelman, S.J., Ward, S.J., 2016. Beyond the search for meaning: A contemporary science of the experience of meaning in life. *Current Directions in Psychological Science* 25, 211–216.
- Klinger, E., 1990. *Daydreaming: Using waking fantasy and imagery for self-knowledge and creativity*. Jeremy P. Tarcher, Los Angeles.
- Koole, S.L., 2009. The psychology of emotion regulation: An integrative review. *Cognition and Emotion* 23, 4–41.
- Lewis-Williams, D., 2004. *The mind in the cave: Consciousness and the origins of art*. Thames & Hudson, London.
- Liu, D.Y., Thompson, R.J., 2017. Selection and implementation of emotion regulation strategies in major depressive disorder: An integrative review. *Clinical Psychology Review* 57, 183–194.
- Lovibond, S.H., Lovibond, P.F., 1995. *Manual for the depression anxiety and stress scales*, 2nd ed. Psychology Foundation, Sydney.
- Maillet, D., Schacter, D.L., 2016. From mind wandering to involuntary retrieval: Age-related differences in spontaneous cognitive processes. *Neuropsychologia* 80, 142–156.
- Martin, L.L., Tesser, A., 1996. Some ruminative thoughts. In: Wyer, R.S. (Ed.), *Ruminative thoughts: Advances in social cognition*. Vol. 9, Erlbaum, Mahwah, NJ, pp. 1–47.

- Matos, A., 2017. Can they unplug? A principal will pay students to forgo screen time this summer. *The Washington Post*, Retrieved June 12, 2017 from [https://www.washingtonpost.com/local/education/can-they-unplug-a-school-principal-will-pay-students-to-forgo-screentime-this-summer/2017/06/09/b22dec4-4c88-11e7-bc1b-fddb8359dee\\_story.html?utm\\_term=.eb6cea081349](https://www.washingtonpost.com/local/education/can-they-unplug-a-school-principal-will-pay-students-to-forgo-screentime-this-summer/2017/06/09/b22dec4-4c88-11e7-bc1b-fddb8359dee_story.html?utm_term=.eb6cea081349).
- Mauss, I.B., Tamir, M., Anderson, C.L., Savino, N.S., 2011. Can seeking happiness make people unhappy? Paradoxical effects of valuing happiness. *Emotion* 11, 807–815.
- McMillan, R., Kaufman, S.B., Singer, J.L., 2013. Ode to positive constructive daydreaming. *Frontiers in Psychology* 4, 626 <https://doi.org/10.3389/fpsyg.2013.00626>.
- McVay, J.C., Kane, M.J., 2010. Does mind wandering reflect executive function or executive failure? Comment on Smallwood and Schooler (2006) and Watkins (2008). *Psychological Bulletin* 136, 188–197.
- Milton, J., 1667. *Paradise Lost*. Retrieved December 28, 2017 from: [https://www.dartmouth.edu/~milton/reading\\_room/pl/book\\_1/text.shtml](https://www.dartmouth.edu/~milton/reading_room/pl/book_1/text.shtml).
- Nakagawa, S., Schielzeth, H., 2013. A general and simple method for obtaining  $R^2$  from generalized linear mixed-effects models. *Methods in Ecology and Evolution* 4 (2), 133–142.
- Nederkoorn, C., Vancleef, L., Wilkenhöner, A., Claes, L., Haverman, R.C., 2016. Self-inflicted pain out of boredom. *Psychiatry Research* 237, 127–132.
- Nguyen, T.V.T., Ryan, R.M., Deci, E.L., 2017. Solitude as an approach to affective self-regulation. *Personality and Social Psychology Bulletin* 44, 92–106.
- Nielsen Total Audience Report, 2018. The Nielsen company. Retrieved March 12, 2019 from: <https://www.nielsen.com/us/en/insights/reports/2018/q2-2018-total-audience-report.html>.
- Nolen-Hoeksema, S., Wisco, B.E., Lyubomirsky, S., 2008. Rethinking rumination. *Perspectives on Psychological Science* 3, 400–424.
- Oettingen, G., 2012. Future thought and behaviour change. *European Review of Social Psychology* 23, 1–63.
- Oettingen, G., Reininger, K.M., 2016. The power of prospection: Mental contrasting and behavior change. *Social and Personality Psychology Compass* 10, 591–604.
- Page-Gould, E., 2013. Multilevel modeling workshop. In: Workshop presented at the meeting of the association for psychological science, New York, NY. <http://www.page-gould.com/mlm/aps/>.
- Pennebaker, J.W., 2018. Personal communication.
- Pennebaker, J.W., Booth, R.J., Boyd, R.L., Francis, M.E., 2015. Linguistic inquiry and word count: LIWC2015. Pennebaker Conglomerates, Austin, TX [www.liwc.net](http://www.liwc.net).
- Pennebaker, J.W., Chung, C.K., Ireland, M., Gonzales, A., Booth, R.J., 2007. The development and psychometric properties of LIWC2007. Software Manual, Austin, TX [www.liwc.net](http://www.liwc.net).
- Petty, R.E., Briñol, P., Tormala, Z.L., Wegener, D.T., 2007. The role of metacognition in social judgment. In: Kruglanski, A.W., Higgins, E.T. (Eds.), *Social psychology: Handbook of basic principles*, 2nd ed. Guilford Press, New York, NY, pp. 254–284.
- Petty, R.E., Cacioppo, J.T., 1986. *The elaboration likelihood model of persuasion*. Springer, New York, NY.
- Pinquart, M., Forstmeier, S., 2012. Effects of reminiscence interventions on psychosocial outcomes: A meta-analysis. *Aging and Mental Health* 5, 2012.



- Powers, W., 2010. *Hamlet's blackberry: Building a good life in the digital age*. Harper, New York.
- Premack, D., 2007. Human and animal cognition: Continuity and discontinuity. *Proceedings of the National Academy of Sciences of the United States of America* 104, 13861–13867.
- Quoidbach, J., Mikolajczak, M., Gross, J.J., 2015. Positive interventions: An emotion regulation perspective. *Psychological Bulletin* 141, 655–693.
- Quoidbach, J., Wood, A., Hansenne, M., 2009. Back to the future: The effect of daily practice of mental time travel into the future on happiness and anxiety. *The Journal of Positive Psychology* 4, 349–355.
- Raza, S., Buttrick, N.R., Westgate, E.C., Heintzelman, S.J., Furrer, R., Gilbert, D.T., Wilson, T.D., 2019. Thinking for pleasure and personal meaningfulness. Unpublished manuscript University of Virginia.
- Roese, N.J., Epstude, K., 2017. The functional theory of counterfactual thinking: New evidence, new challenges, new insights. In: Olson, J.M. (Ed.), *Advances in experimental social psychology*. Vol. 56, Academic Press, San Diego, CA, pp. 1–79.
- Roese, N.J., Olson, J.M., 1997. Counterfactual thinking: The intersection of affect and function. In: Zanna, M.P. (Ed.), *Advances in experimental social psychology*. Vol. 29, Academic Press, San Diego, CA, pp. 1–59.
- Ruane, M.E., 2017. Marked dead in Vietnam, a long journey back to life. *The Washington Post* A1–A16.
- Ruby, F.J., Smallwood, J., Engen, H., Singer, T., 2013. How self-generated thought shapes mood—The relation between mind-wandering and mood depends on the socio-temporal content of thoughts. *PLoS One* 8, e77554.
- Schiffer, L.P., Roberts, T., 2017. The paradox of happiness: Why are we not doing what we know makes us happy?. *The Journal of Positive Psychology* 13, 252–259.
- Schlegel, R.J., Hicks, J.A., King, L.A., Arndt, J., 2011. Feeling like you know who you are: Perceived true self-knowledge and meaning in life. *Personality and Social Psychology Bulletin* 37, 745–756.
- Schooler, J.W., Ariely, D., Loewenstein, G., 2003. The pursuit and monitoring of happiness can be self-defeating. In: Carrillo, J., Brocas, I. (Eds.), *Psychology and economics*. Oxford University Press, Oxford, GB, pp. 41–70.
- Sedlmeier, P., Eberth, J., Schwarz, M., Zimmermann, D., Haarig, F., Jaeger, S., Kunze, S., 2012. The psychological effects of meditation: A meta-analysis. *Psychological Bulletin* 138, 1139–1171.
- Seli, P., Kane, M.J., Smallwood, J.S., Schacter, D.L., Maillet, D., Schooler, J.W., Smilek, D., 2018. Mind-wandering as a natural kind: A family-resemblance view. *Trends in Cognitive Sciences* 22, 479–490.
- Seli, P., Risko, E.F., Smilek, D., 2016. On the necessity of distinguishing between unintentional and intentional mind wandering. *Psychological Science* 27, 685–691.
- Seli, P., Risko, E.F., Smilek, D., Schacter, D.L., 2016. Mind-wandering with and without intention. *Trends in Cognitive Sciences* 20, 605–617.
- Sheldon, K.M., Lyubomirsky, S., 2006. How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves. *The Journal of Positive Psychology* 1, 73–82.

- Shumaker, B., 2010. This emotional life: My life as a POW. The Huffington Post, Retrieved January 4, 2017 from [http://www.huffingtonpost.com/bob-shumaker/this-emotional-life-my-li\\_b\\_404905.html](http://www.huffingtonpost.com/bob-shumaker/this-emotional-life-my-li_b_404905.html).
- Singer, J.L., 1955. Delayed gratification and ego development: Implications for clinical and experimental research. *Journal of Consulting Psychology* 19, 259–266. <https://doi.org/10.1037/h0044541>.
- Singer, J.L., 1975. Navigating the stream of consciousness: Research in daydreaming and related inner experience. *American Psychologist* 30, 727–738. <https://doi.org/10.1037/h0076928>.
- Singer, J.L., 1975. *The inner world of daydreaming*, Harper & Row, New York.
- Singer, J.L., Antrobus, J.S., 1963. A factor-analytic study of day-dreaming and conceptually-related cognitive and personality variables. *Monograph Supplement 3-V17 Perception and Motor Skills* 17, 187–209.
- Singer, J.L., Rowe, R., 1962. An experimental study of some relationships between day-dreaming and anxiety. *Journal of Consulting Psychology* 26, 446–454. <https://doi.org/10.1037/h0047094>.
- Sjåstad, H., Baumeister, R.F., 2018. The Future and the Will: Planning requires self-control, and ego depletion leads to planning aversion. *Journal of Experimental Social Psychology* 76, 127–141.
- Smallwood, J., Schooler, J.W., 2006. The restless mind. *Psychological Bulletin* 132, 946–958.
- Smith, E.N., Frank, M.C., 2015. In: Wilson, et al. (Eds.), *Replication of “just think: The challenges of the disengaged mind; Study 8”*. Stanford University, (2014, Science). Unpublished manuscript.
- Somer, E., 2002. Maladaptive daydreaming: A qualitative inquiry. *Journal of Contemporary Psychotherapy* 32, 197–212.
- Song, X., Wang, X., 2012. Mind wandering in Chinese daily lives—An experience sampling study. *PLoS One* 7, e44423.
- Stawarczyk, D., Cassol, H., D'Argembeau, A., 2013. Phenomenology of future-oriented mind-wandering episodes. *Frontiers in Psychology* 4, 425.
- Stawarczyk, D., Majerus, S., Maj, M., Van der Linden, M., D'Argembeau, A., 2011. Mind-wandering: Phenomenology and function as assessed with a novel experience sampling method. *Acta Psychologica* 136, 370–381.
- Steger, M.F., Frazier, P., Oishi, S., Kaler, M., 2006. The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology* 53, 80–93.
- Storr, A., 1988. *Solitude: A return to the self*. The Free Press, New York.
- Tamir, M., 2016. Why do people regulate their emotions? A taxonomy of motives in emotion regulation. *Personality and Social Psychology Review* 20, 199–222.
- Tang, Y., Hölzel, B.K., Posner, M.I., 2015. The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience* 16, 213–225.
- Thoreau, H.D., 1854/2009. *Walden or, a life in the woods*. Martino, Mansfield Centre, CT.
- Thorndike, E.L., 1927. The law of effect. *The American Journal of Psychology* 39, 212–222.

- Thurber, J., 1939. The secret life of Walter Mitty. *The New Yorker*, Retrieved June 12, 2017 from <http://www.newyorker.com/magazine/1939/03/18/the-secret-life-of-walter-james-thurber>.
- Tomasello, M., 2014. *A natural history of human thinking*. Harvard, Cambridge, MA.
- Treynor, W., Gonzalez, R., Nolen-Hoeksema, S., 2003. Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research* 27, 247–259.
- Tugade, M.M., Fredrickson, B.L., 2007. Regulation of positive emotions: Emotion regulation strategies that promote resilience. *Journal of Happiness Studies* 2007, 311–333. <https://doi.org/10.1007/s10902-006-9015-4>.
- Tusche, A., Smallwood, J., Bernhardt, B.C., Singer, T., 2014. Classifying the wandering mind: Revealing the affective content of thoughts during task-free rest periods. *NeuroImage* 97, 107–116.
- Vazeou-Nieuwenhuis, A., 2018. Connecting the dots from a distance: Does mentally traveling through space and time increase searching for life's meaning?. *The Journal of Positive Psychology* 13, 165–173. <https://doi.org/10.1080/17439760.2016.1257047>.
- Wade-Benzoni, K.A., Tost, L.P., 2009. The egoism and altruism of intergenerational behavior. *Personality and Social Psychology Review* 13, 165–193.
- Walsh, R., Shapiro, S., 2006. The meeting of meditative disciplines and Western psychology: A mutually enriching dialogue. *American Psychologist* 61, 227–239.
- Wayne, T., 2016. The end of reflection. *New York Times*, Retrieved December 28, 2016 from: <http://www.nytimes.com/2016/06/12/fashion/internet-technology-phones-introspection.html>.
- Waytz, A., Hershfield, H.E., Tamir, D.I., 2015. Mental simulation and meaning in life. *Journal of Personality and Social Psychology* 108, 336–355.
- Webb, D., 2007. *Privacy and solitude in the middle ages*. Continuum, London, UK.
- Wegner, D.M., 1994. Ironic processes of mental control. *Psychological Review* 101, 34–52.
- Wegner, D.M., 2002. *The illusion of conscious will*. MIT Press, Cambridge, MA.
- Wegner, D.M., Zanakos, S., 1994. Chronic thought suppression. *Journal of Personality* 62, 615–640.
- Westgate, E.C., Wilson, T.D., 2018. Boring thoughts and bored minds: The MAC model of boredom and cognitive engagement. *Psychological Review* 101, 34–52.
- 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.
- Wilcox, K., Laran, J., Stephen, A.T., Zubcsek, P.P., 2016. How being busy can increase motivation and reduce task completion time. *Journal of Personality and Social Psychology* 110, 371–384. <https://doi.org/10.1037/pspa0000045>.
- Wilson, T.D., 2002. *Strangers to ourselves: Discovering the adaptive unconscious*. Harvard University Press, Cambridge, MA.
- Wilson, T.D., Reinhard, D.A., Westgate, E.C., Gilbert, D.T., Ellerbeck, N., Hahn, C., Brown, C., Shaked, A., 2014. Just think: The challenges of the disengaged mind. *Science* 345 (6192), 75–77.
- Zeng, X., Chiu, C.P.K., Wang, R., Oei, T.P.S., Leung, F.Y.K., 2015. The effect of loving-kindness meditation on positive emotions: A meta-analytic review. *Frontiers in Psychology* 6, 1693.

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