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Mind Wandering in Daily Life: A National Experience Sampling Study of Intentional and Unintentional Mind Wandering Episodes Reported by Working Adults Ages 25 – 50

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MIND WANDERING IN DAILY LIFE: A NATIONAL EXPERIENCE SAMPLING STUDY
OF INTENTIONAL AND UNINTENTIONAL MIND WANDERING EPISODES
REPORTED BY WORKING ADULTS AGES 25–50

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DOCTOR OF PHILOSOPHY

by

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This dissertation by Paula C. Lowe has
been approved by the committee members signed below
who recommend that it be accepted by the faculty of the
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Donna Ladkin, PhD, Committee Chair

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Dedicated To

George A. Lowe

I intentionally mind wander creative thoughts about you in the past

while at my work doing demanding tasks and feeling great!

ABSTRACT

MIND WANDERING IN DAILY LIFE: A NATIONAL EXPERIENCE SAMPLING STUDY
OF INTENTIONAL AND UNINTENTIONAL MIND WANDERING EPISODES
REPORTED BY WORKING ADULTS AGES 25–50

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Numerous researchers have investigated thinking that drifts away from what the individual was doing, thinking that is known as mind wandering. Their inquiries were often conducted in university lab settings with student participants. To learn about mind wandering in the daily life of working adults, this experience sampling study investigated intentional and unintentional mind wandering episodes as reported by working adults, ages 25–50, living across the United States. In this age frame, work and family responsibilities have increased in complexity and overlap. Using a smartphone app, participants were randomly notified to answer experience sampling surveys six times a day for up to five days. Eight questions concerned frequency, intentionality, and the descriptive characteristics of thought type, thought content, temporality, context, context demand, and emotion. Based upon 7,947 notification responses and 4,294 reported mind wandering episodes, the research findings showed that mind wandering is a common thinking experience in working adult daily life and is differentiated by intentionality, parent status, and gender. Parents reported more frequent mind wandering and intentional mind wandering episodes than nonparents. Episode thought type was most often indicated as practical thought. Episodes were more often reported as having the content related to context although out of context mind wandering episodes were also highly reported. Context demand and emotion at the time of the notification were related to mind wandering episode frequency and were further differentiated by intentionality, parent status, and gender. Working parents reported mind

wandering episodes during higher demand, particularly male parents, than nonparents. By generating new knowledge about the thinking life of working adults, this study's results and methodology contribute to the fields of leadership and change, thought research, intrapersonal and interpersonal psychology, work and family studies, and education. Future studies focused on underlying factors related to the mind wandering of working adults and the differences between parent and nonparent mind wandering may inform our understanding of working adult mind wandering. This dissertation is available in open access at AURA: Antioch University Repository and Archive (https://aura.antioch.edu/) and OhioLINK ETD Center (https://etd.ohiolink.edu/).

Keywords: mind wandering, off-task thinking, mind wandering intentionality, thought type, thought content, temporality, context demand, emotion, leadership, intrapersonal psychology, neuropsychology, productivity, boundary theory, working parent, nonparent worker, atelicity, kin care, creative thinking, experience sampling, participant level data analysis, episode level data analysis

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Artist's note: If the drawings appear a bit rough, it was because drawing with my right ring finger on my iPhone screen was a bit imprecise. These drawings were literally head to hand. I hope they have added a bit of humor and insight to this dissertation.

CHAPTER I: INTRODUCTION

In general, we are least aware of what our minds do best (Minsky, 1986/2014).

Each day billions of us go about our family, work, and community lives juggling thoughts about home, work, self, and everything else, as shown in Figure 1.1. We are often doing one thing while thinking about something else. The term for this is "mind wandering."

Figure 1.1

What I Think About

Note: *What I Think About.* Copyright 2022 by Paula C. Lowe.

Mind wandering has been defined as when an individual's conscious experience is not tied to the events or tasks one is performing (Seli et al., 2018b). It has been described as shifts in attention away from a primary task toward the individual's internal information (Vannucci et al., 2017, p. 61). Mind wandering has been established as a common brain activity that involves thinking about things, people, and experiences that are not present in time or place. Researchers

have reported finding this task-unrelated thinking to occur during 30%–50% of adult waking time (Franklin et al., 2013; Killingsworth & Gilbert, 2010). Certain studies found intentional mind wandering, reported as when an individual responded as open to mind wander, and unintentional mind wandering that "just happened or popped up" were linked to different contextual factors, i.e., intentional mind wandering to low task demand and repetitive task performance, and unintentional mind wandering to high sustained and monotonous task demand wandering (Christoff et al., 2016; Golchert et al., 2017; Seli et al., 2017b, 2018b).

What drew me to create my own study about mind wandering was that eye-popping 30%–50% of adult waking time. What do we know about this frequency of thinking in working adult daily life? Is this a frequency dependent on lab conditions or is it all of us, every day, everywhere, thinking about things that are not about what we are doing?

 I asked these questions as a doctoral candidate in leadership and change. My rationale was this. To lead people requires us to appreciate people as individuals. To appreciate people as individuals means to recognize them as thinkers. Mind wandering is invisible thinking, personal thinking, not-about-task thinking. Research has distinguished two types of mind wandering, intentional and unintentional. By conducting this exploratory study, I wanted to expand our understanding, where we live, work, and learn, about being a "thinker." For as Dr. Claire Zedelius said to me some time ago, "minds don't think, we think."

In this dissertation, I utilized experience sampling and quantitative analyses to examine mind wandering in working adult daily life. I investigated mind wandering types, intentional and unintentional mind wandering, and six descriptive variables about mind wandering episodes that were reported by adults ages 25–50 living and working in the United States. As with mind wandering having two manifestation, I recognized adult life as having two conditions related to

parenting status. Working parents had overlapping work and parenting relational responsibilities that were constant, often overwhelming, and unending; nonparents did not have the dual demands of working and parenting. Further, I sought to understand the relationship between mind wandering and gender, and as this modified parent status. The dependent variable was mind wandering, further defined as intentional and unintentional mind wandering.

In this chapter, I provide the roots of the problem in practice, mind wandering in human experience, study purpose, and the significance of this study in the fields of leadership and change and psychology. I then offer my researcher background and positionality, before describing the study sample, study variables, methodology, and organization of the dissertation. I share considerations that informed me as I designed this inquiry, moving back and forth between selected studies and my inquiry to translate the knowledge of the field into the research I conducted. Along the way, I offer my drawings to punctuate and illustrate my points and reasoning with the goal of making this dissertation more accessible to you, my reader.

The Problem in Practice

Mind wandering, doing one thing while thinking about something else, has been described as common and frequent thinking (Franklin et al., 2013; Killingsworth & Gilbert, 2010). Yet mind wandering as a thinking mode has a history of being viewed as counterproductive. That is, our American culture hardened around being on-task (Price, 2017), seeing mind wandering as inferring with getting things done. Because the discipline of leadership and change is about leading people somewhere to do something, and mind wandering has been established in research as common and frequent, and our American culture tells us to not do the off-task thing, then, take a breath, how do we reconcile the problem in practice? That is, working adults are supposed to be on task, thinking about task, doing task, but they are not, not always.

The problem in practice is that those of us in leadership and change do not know much about a type of thinking that working adults do all day every day. Without knowledge about frequency and descriptive aspects of mind wandering in populations we lead, we may ignore the relevance of incorporating mind wandering in our philosophies and practices of leadership and change. We may presume the attention and engagement of those who listen to and work with us, even ourselves. As well, given our history of wanting more, more, more success as we work together with others, we may inadvertently disrespect the "whole persons" with whom we work. Just two pages ago you read that studies say mind wandering is taking up about 30%–50% of daily life awake time. This is a stunning amount of waking time and thought in each day! This study found these rates to be even higher for working adults in daily life.

The societal narrative about being incessantly useful long characterized off-task thinking in trivializing ways, embedding attitudes that we were either "doing something" or wasting time. Even the term "mind wandering" inferred not paying attention, not being where we were supposed to be. However, Dane (2018) pointed out several benefits of mind wandering:

> emerging lines of research suggest that in some respects mind wandering can be beneficial (Mason & Reinholtz, 2015; Smallwood & Schooler, 2015). While acknowledging that mind wandering can compromise how effectively people engage with an assigned task, such research maintains that mind wandering can attune people to their goals (Klinger, 2008), lead them to anticipate and plan for the future (Mason et al., 2009), and help them generate creative solutions to challenging problems (Baird et al., 2012). These lines of research suggest that mind wandering is not only a basic tendency of the human mind but also an adaptive one (Baars, 2010; McMillan, Kaufan & Singer, 2013). (Dane, 2018, p. 179)

Over the past 25 years, psychologists investigating the mind of the person and not the agenda of productivity have produced considerable research, a selection of which is presented in Chapter II, to challenge reductive positions on mind wandering. Psychologists asserted that mind wandering was not a "thing" with a simple definition. For example, Damasio wrote that,

"Consciousness fluctuates with the situation" (2010, p. 178) and suggested that mind wandering might be better called "self-wandering" because "daydreaming requires not merely a lateral wandering away from the contents of the activity but a downshift to the core self. Consciousness downshifted to core self and distracted from another topic is still normal consciousness" (p. 180).

While researchers ascertained that mind wandering was a form of thinking that was valuable for its variegated uses and companioning consciousness, people in general may continue to hold embedded negative views of mind wandering as wasteful or may be unaware that mind wandering is even a state of mind. Zedelius and Schooler (2017) cautioned researchers in the field of mind wandering to pay attention to the lay theories or mindsets that people use to see and understand their behavior. These mindsets may not be observable, but they can be active in individuals' sense of what behavior is okay and what can be expected from other people.

My study participants may not have known much about mind wandering prior to being in this study. They may even have held some "not such a good thing" mindsets. They may not have heard that there was or is a problem in practice about lack of knowledge or consideration for mind wandering in daily life. But they were generous and curious. They showed up. They put a strange new app on their smartphones and allowed themselves to be notified at six random times a day for up to five days. Working adults from all over the United States brought goodwill to my research. I was open to be surprised, and I was surprised. I ask you, my reader, to join me in appreciating the hundreds of people who contributed thousands of mind wandering episodes to form the data analyzed in this study. As makers and takers, this study offers "lived knowledge" about working adult mind wandering.

Mind Wandering Animates Human Experience

Before I began researching the common everyday thinking called mind wandering, I was curious about how we can have multiple "presence of mind." That is, we can be doing one thing while thinking about another, mentally moving between the domains of personal/family life, work life, and community life. We can be in a kitchen and think of work. We can be at work and suddenly thinking about painting that kitchen. How is this possible?

I began researching mind wandering to understand how thinking animates human experience because other theories about thinking missed this fluidity. Boundary theorists said that individuals vary in the roles they enact, people use segmentation and integration, and generally, people try to minimize the difficulty and frequency of role transitions and interruptions (Ashforth et al., 2000; Ashforth et al., 2008). Researchers proposed that "working adults develop boundaries around work and personal life domains that vary in strength" (Bulger et al., 2007) and this would make sense with the role theory proposed in the mid-20th century (Allen et al., 2014). However, a rigid boundary theory does not fit daily life. As an illustration, Figure 1.2 shows Jose who appeared to have his mind on coding while he was every so often mind wandering about his wife who was home with their newborn son. A boundary-based experience model was not constructed for escape artist thinking. Jose was at work, but he was thinking about Maria, was she okay?

Figure 1.2

Boundary-Based Human Experience Model
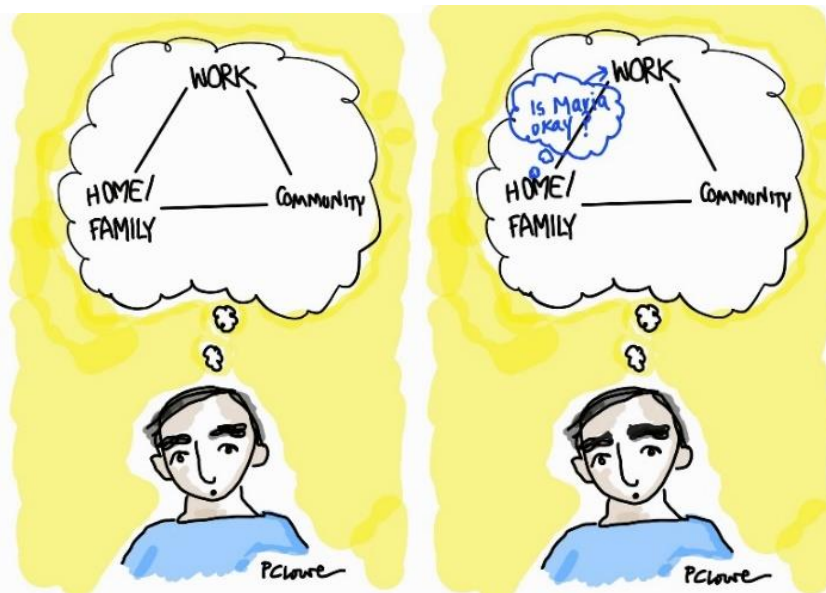
Note: *Boundary-Based Human Experience Model*. Copyright 2022 by Paula C. Lowe.

A boundary-based human experience model provided a snapshot of multi-domain thinking. However, human experience thinking seems more like a mother cat who both hunts and runs back to check her kittens. Minsky (1986/2014) said, "you don't understand anything until you learn it more than one way" (p. 29). In Figure 1.3, I drew Gizelle as she worked to meet a deadline and mind wandered about a recent day at the park when her kids. Her thinking was not angular or static. Of the types of conscious thinking, mind wandering, the kind we do that is not about what we are doing, could be a means for how we unify, visit, and process our human experiences both within and beyond domains.

Figure 1.3

Continuous Human Experience Model
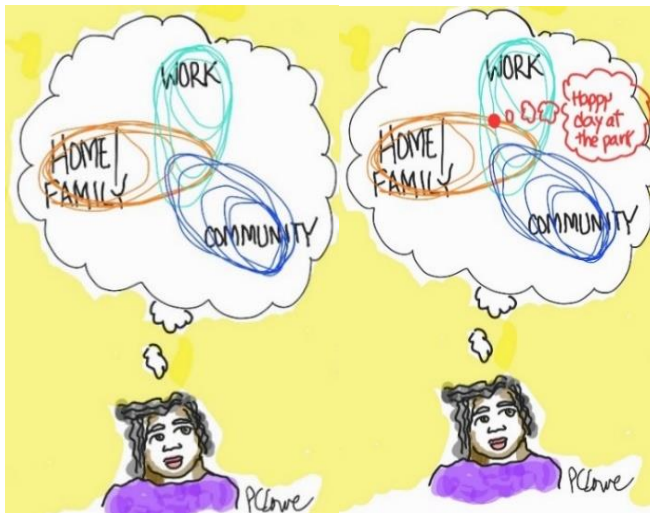
Note: *Continuous Human Experience Model.* Copyright 2022 by Paula C. Lowe.

"We're more aware of simple processes that don't work well than of complex ones that work flawlessly" (Minsky, 1986/2014, p. 29). The term mind wandering has labelled the important mental process of task-decoupled thinking. How incredible is this? Well, imagine a day bereft of off-task thoughts—no flash to the party on Saturday, no image of fall leaves from years gone by, no giggling anticipation about finger painting with a child. Full on-task thinking lacks the capacity to shift our thoughts back and forth between time, people, places, needs, and wants, and this capacity is how we imagine and remember, key parts of the formation of culture and family life.

<div align="center">

Research Purpose, Questions, Significance

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This section speaks to this study's purpose, research question, and significance for leadership and change. It begins by framing mind wandering as to kin care, atelicity, and human experience.

Study Purpose

The purpose of this exploratory study was to generate new knowledge about working adult thinking known as mind wandering to expand our understanding of this type of personal thinking in daily life. My further purpose was to see if intentional and unintentional mind wandering frequencies and episode characteristics were different by parent status and gender for working adults. I explored both types of mind wandering, intentional and unintentional, and both conditions for working adults, parents and nonparents, and gender, male and female.

My intention has been to contribute this knowledge to the field of leadership and change to enhance a new and broader appreciation of thinking processes for both leaders and those they lead. We cannot know thoughts by looking at people. In Figure 1.4, we see Anita at her work and imagine that her opened laptop with her eyes aimed its screen tell us how she was thinking. However, in fact, she was visibly working and invisibly mind wandering.

As well, I wanted to contribute to the field of thought process research as the intentional and unintentional mind wandering of working adults, and more specifically, parents and nonparents, and by gender, ages 25–50 had not been studied. This population presented with daily demands, responsibilities, and expectations for productivity that exceeded those of younger adults who have often been the participants in lab-based studies.

Figure 1.4

While I Work I Also Mind Wander

Note: *While I Work I Also Mind Wander.* Copyright 2022 by Paula C. Lowe.

A circumstantial extra part of my purpose was to contribute knowledge about the daily life mind wandering episodes reported by working adults at the end of the second year of the Covid 19 pandemic. These data inform our understanding as to the ways in which working adults, particularly parents, were mind wandering during this multi-phased pandemic.

Overall Research Question

My overall research question for this exploratory study was to investigate frequencies and attributes of working adult mind wandering. This question was then operationalized in five research questions presented in Chapter III and implemented in Chapter IV.

Overall Research Question: What can we learn about working adult mind wandering by investigating the rates and characteristics of overall, intentional, and unintentional daily life mind wandering episodes for working adults, by parent status, and gender?

Study Significance

This study generated data we did not have about the ways in which working adults think in daily life. This research had not been conducted for this population, and the results of this study have significance for both professional and lay communities.

Significance for Leadership and Change

Understanding mind wandering, thinking that is not about what an individual is doing, is essential in a leadership doctoral program concerning leadership philosophies and practices. Understanding the ways in which people process information is elemental for leaders to appreciate the individuals they seek to lead. We may expect that people who gather for a work purpose in a workspace always think about work. In this study, I informed those expectations to consider a more realistic view of daily thinking that is quite often not about what one is doing. The intent of this research was not to fix the ways in which we naturally think, but to reveal these ways so we can lead "whole people" more compassionately, realistically, and effectively.

To practice ethical respect for each other in the work we do together, we can learn to better appreciate the unseen aspects of our personhood, that even in the presence of each other, we have thoughts of our own that are not about the public task in which we appear to be engaged. These thoughts, perhaps especially thoughts that come and go as in mind wandering thoughts, inform and are informed by what matters to us in our daily lives. The ethical significance of this study lies in learning about mind wandering so we can better respect each other's privacy of thinking as valuable, not only when that thinking is joined in common task, but also when that thinking is personal and invisible.

The *Pulse of American Worker Survey* (Prudential Newsroom, 2021) concluded the boundaries between work and life have increasingly blurred. One in three working adults ages

25–42 reported they planned to look for a new job after the Covid pandemic, citing how leaders and businesses treated them during a difficult time. It is the last statement in this brief overview that circles back to this study, "leaders need to understand what their people are thinking." I would adjust that to say that leaders need to understand "the ways" in which people are thinking. As introduced at the beginning of this chapter, researchers have asserted that thirty to fifty percent of adult mind activity during waking time is devoted to mind wandering (Franklin et al., 2013; Killingsworth & Gilbert, 2010). When leaders want to understand what employees are thinking, mind wandering is a key thought process in which context and content, the "what people are thinking," can be found. The reason for understanding this thinking is not to invade the privacy of personal thought. Instead, it is to respect that personal thought and task-based thought are

co-existent.

Just about everything leaders assume about people as they plan to help them do this or that depends upon how those people mentally process and internalize the information and directions a leader sends out. As leaders conduct a meeting or speak to small groups, interact with their staff members, or video conference with individuals, those leaders may suppose that people think in ways that fit their messages. Yet, quite often, people do not think in those fitting ways. People think their own thoughts about who knows what. Even leaders in the midst of leading may think other thoughts. This difference between leader expectations and human mind reality creates problems in practice for leaders who may just try harder, make more flow charts, schedule more meetings, and label mind wandering as "costing us." Figure 1.5 illustrates the problem in practice when a leader forges on and on without recognizing individuals' normal consciousness.

Leaders may miss a simple truth: a mind is a busy machine. It is not full steam or no steam. As this study has learned, quite often we are checking in with other content. Knowing how frequent off-task thought, sometimes unintentional and sometimes intentional, occurs in daily life is elemental for leaders to appreciate and work with people as they are, including ourselves since we each mind wander and have been doing so several times while reading this chapter. Yes, leaders are to be good listeners, but not all listening is to hear what is audible.

Figure 1.5

Leader Speaks. Individuals Listen and Mind Wander.

Note: *Leader Speaks. Individuals Listen and Mind Wander*. Copyright 2022 by Paula C. Lowe.

Perhaps the term researchers settled on, "mind wandering," conjures an image of being lost in a Wal Mart. Mind wandering is its own consciousness occurring in bits of time day in and day out. With this dissertation, lodged not inside a cognitive psychology program at a university full of human behavior research but within a leadership doctoral program, I chose to inform leadership pedagogy that may not have considered mind wandering as a major element of

thinking life. I took mind wandering out of the obstacle column and into the "so if this is happening, how do we work with it?"

This research was conducted for leaders and the people they strive to lead—people flipping burgers, teaching children, driving front end loaders (yes, Henry, I said it) or UPS trucks, sitting at desks or kitchen tables, picking vegetables in fields, or caring for patients. A by-product of this dissertation may be to increase empathy for one another, letting us imagine being in the shoes of others to find out that we too are invisibly thinking. A methodology by-product may be to show that experience sampling within leadership and change research gathers participant information in real time.

Significance for the Field of Psychology

This study was significant in the field of psychological research using experience sampling as it "broke new ground" in the exploration of the mind wandering episodes of working adults in daily life across the United States. The study was simply designed but cast a wide net to include a large, diverse sample. This design was befitting an exploratory study as I endeavored to determine frequencies and descriptive variables for working adult mind wandering episodes. This research brought new knowledge to the field of psychology and opened new questions for human behavior and neuropsychology research as articulated in Chapter V.

My inquiry was also significant as I was attentive to three topics in psychology. These concerned familial bonds, also known as kin care. The second was about atelicity, the ongoing nature of parenting activities. Third, the study informed human experience psychology more broadly as data was collected in the context of the Covid Pandemic. Bringing fresh questions into the field of mind wandering research and cross-pollinating the purposes of inquiry encouraged looking at this phenomena by juggling our eyes.

I endeavored to fill a gap in the scholarly research about working adults' daily life mind wandering comparing the experiences of parents and nonparents. As studies on human social motivation have rated long-term familial bonds as of primary importance to individuals across cultures (Ko et al., 2020), I generated knowledge about the frequency and relationship of this motivation in intentional and unintentional mind wandering and descriptive variables in mind wandering experiences. I asked about mind wandering episode content related to children and other family members and friends.

Secondly, I added knowledge that informs our understanding as to how parent "thinking" about family is, by its life long and daily nature, atelic. Atelic means that a role is incomplete because tasks are continuous and unending (Irving, 2016). While it is true that life itself could be described as atelic, parenting is not merely, "I have to feed kids again today." Being a parent of a child or children is a role relationship that presents with endless responsibilities. This study did not "prove" that parenting is atelic, but rather, this study informed our understanding of this atelicity by exploring the thought type, content, and other descriptive variables of mind wandering episodes.

I expanded on the lab-based research finding that mind wandering was frequently experienced as I studied this thinking in the daily life of working people. Sharing this knowledge with all of us, beyond academic communities, matters because, "When your experience is limited to your home, or your workplace, or your own personal habits, you don't have a benchmark to see if what you are doing is common" (Des Georges, 2019, p. 1). Much of the research about working adults experience during the 2020–2022 Covid span was statistical, i.e., census data, job loss data, school debt data. This study generated "thinking data" of mind wandering episodes for working adults.

Researcher Background and Positionality

Being a contributor to the collective good has been a central part of my work in educational psychology, particularly on behalf of working families while I too have been a working parent and grandparent. I have consulted for various constituencies, i.e., Head Start, military, at-risk, working families, urban and rural schools, corporations, universities, and more. I served as a family therapist working with individuals, trained thousands of people in multi-day settings, taught every age, always with a passion for helping individuals appreciate themselves and work together with others. As well, I share lived stories through poems published in numerous journals, anthologies, and books. I am a small press publisher. As this dissertation bears my mark, I am a line artist.

Across my work, intentional mind wandering has enabled me to "let a fly in" particularly when pulling together a conceptual basis for a problem I wanted to explore and reveal. Schwartz-Shea and Yanow (2012) described me as one of those who "believes that the first step in a research design has to be the identification and definition of concepts" (p. 45) that are informed by "what if" thinking. I also appreciate the gold to be found in "pop up" unintentional mind wandering. Very often such thinking appears in a drawing. Figure 1.6 is a photograph I took at the National Gallery London of a Jean-Auguste-Dominique Ingres. Perhaps Madame Moitessier was mind wandering in that prolonged uncomfortable pose, her hand likely falling asleep. I mind wandered her image into my art, rendered pieces of thought (see Appendix L: Permissions and Copyrights).

Figure 1.6

Madame Moitessier Seated. Madame Moitessier Mind Wandering.

Note: Madame Moitsessier Seated, artist, Jean-Auguste-Dominique Ingres, 1856, photograph. Copyright 2022 by Paula C. Lowe. *Madame Moitessier Mind Wandering,* artist, Paula C. Lowe. Copyright 2022 by Paula C. Lowe.

My positionality as I conducted this study has been that mind wandering is valuable, a kind of companion type of frequent thought, a bit of conversation with self, both pop-up unintentional and open-to intentional types. While I have unintentional mind wandering thoughts about the sale on pillows at Wayfair, intentional mind wandering has been a resource for my creativity, particularly inspiring me to pursue this dissertation.

My positionality for this study was not limited to my attitudes about mind wandering. It was informed by my gratitude to the hundreds of participants in this study. As a researcher, I recognized that each respondent episode was submitted by a mom or dad, a sister or a friend. I respected that I was discovering the episode stories of working people, real here and now people, not just entering data into SPSS. Because of this attitude, on days of discovery, I could be heard hollering WOW! I was perpetually excited to tell anyone, sometimes just the coyote pup in the bushes beyond my rural office, about my findings. It has been my privilege to spend this very long time within this inquiry.

Study Population

The population for this dissertation was adults ages 25–50 living and working in the United States. My focus concerned two conditions determined by parent status and by gender. Adults ages 25–50 constitute millions of American workers (Fry, 2018, p. 1). I chose this age frame for a central reason. During this span of 25 years, working adults build upon college and job training and are in phases of early to mid-adult life. Because this study found parent status to be a big descriptor of working adult life, this frame recognized that it takes eighteen years to raise a child in the home, and many families have two or more children. Therefore, 25 years was an inclusive frame within which I also looked at gender.

Working adults in this large time frame have big picture experience. Across the United States, they have gone through major recessions, changes in the work world that reduced and reconfigured jobs for some at critical employment stages, high costs of living, student loan debt, social justice struggles, climate change impacts, Covid 19 pandemic, inflation, the invasion of Ukraine, and more. Fewer and less permanent job opportunities had some moving back in with family or friends. In the spring of 2020, only three in ten adults aged 25–40 lived with a spouse and child, far fewer than in previous generations at this life stage (Barroso et al., 2020, p. 2). While job opportunities and wages improved in 2021, inflation and economic uncertainties ate away at those improvements in 2022.

Many in this study were in the generation of Millennials, ages 25–42. Reporting in *Gallup Workplace*, Adkins (2021) wrote that Millennials holding jobs have been estimated at 56 million, representing 35% of the workforce in the United States. Adkins said Millennials have been typified as "job-hoppers" prone to switch jobs. Six in ten reported that they are not only open to new opportunities, but they also invite change. Called the least engaged generation in the

workplace, perhaps engagement could be better understood as a generation that has learned to look out for "my career" and not assume "my company."

Working adults, after years of disruption and re-invention due to the Covid pandemic, have experienced an employment world that is deconstructed and reconstructing. More remote work and virtual first, a remote and on-site blend, are available for those who work on laptops, e.g., computer engineers. For those in customer service, jobs are not just changing, some jobs are being eliminated with self-check outs, robots, and online shopping that shift work to warehouse and delivery. For those in labor-based jobs, i.e., restaurant service, road construction, or firefighting, physical presence continues to be required. The inability to hybridize certain employment, the elimination of certain types of work, and the relocation of certain jobs to places where workers may not be able to follow create unpredictability for working adults in the United States.

Working Parents

In this study, I sought to learn the ways in which parent status, and further gender, were related to the episode reports of mind wandering frequency and descriptive variables. While all of us experience the unending nature of our tasks and daily routines, this is more pronounced for parents. There is ongoing tension between parenting and working, a certain atelicity, unfinished-ness (Irving, 2016, p. 83) as relational tasks recur and the core activities of parenting and work, balancing back and forth, day in and day out, span decades. The feeding and serving and cleaning in a household are in a looping cycle. One can drop a child at school only to worry about her all day, every day. Each domain, work then home then work then home, takes "its shift" but does not leave the other domain fully behind. In the wind down of the Covid pandemic, when schools or daycares were reopening, work became remote, hybridized,

furloughed, or terminated, boundaries between home and work became blurrier than ever. Which was important in the moment? A report Anita was working on at her kitchen table or her seven-year-old melting down after hours of remote learning at the other end of that same table? Dowling wrote, "There's no playbook…. the problem persists for 18 year or more without ever getting easier" (2019).

Working parents in the United States have undependable resources. Schools and childcare centers have undergone operational uncertainties. Many have left the teaching professions during and after the Covid pandemic, and school district leaders have said they are "squeezed by the conflicting pressures set by new state mandates and parent demands" (Hill & Destler, 2022). Job losses and working from home reinvented the proximity, even overlap, of work to homelife. As closures and mixed openings continued, 617,000 women left the workforce in September 2020 (Tappe, 2020, p. 1) in industries that typically employed women; working moms, three times more likely than dads to take on housework and caregiving, made hard choices about careers because children were at home and needed them there.

Historically, working parents have weathered the big things—wars, depressions, pandemics—beyond the scope of a family's control. *The New York Times* observed at the onset of the coronavirus, "with children popping up in Zoom meetings and essential workers needing to go to work despite having no childcare, it's impossible to hide what has always been true: raising children is a round-the-clock responsibility" (Miller, 2020, p. 1). Within this report, Dr. Lakshmi Ramarajan, professor at Harvard Business School, was quoted, "our current situation is posing fundamental challenges to the idea that personal and professional identities can be kept separate" (p. 1). In its national analysis of 6.7 million caregivers, Blue Cross Blue Shield, a nonprofit insurance company, reported that 26% of unpaid caregivers balancing work and family

due to Covid 19 have felt more stress and said that working parents have been the hardest hit by this stress (LaMotte, 2020, p. 3). In a segment for PBS on impossibility of working from home while supervising children at home, reporter Laura Santhanam wrote, "It doesn't help that they (working parents) must stare down the same uncertainty every day, that 'everything could change in a moment'" (2020, p. 7).

As Covid vaccinations and adaptations brought some normalcy, it has been an edgy normalcy. Virus variants erupted as the pandemic morphed in the United States. As well, and something that this dissertation was sensitive to, the pandemic's isolation and struggle experiences generated a certain post-traumatic stress and loss of trust and continuity with one's life before and after the pandemic. As reported on CNN, "The great reopening and return to pre-pandemic life is a tale of two timelines—and parents are caught in the middle" (Tappe, 2021, p. 1). It was not just disruption that changed family life. Coping with loss of "who we were" hit everyone. Coping with the loss of a loved one hit particular families and communities, the people who left us.

Carrying the weight of work and family responsibilities is a feat on rough ground. In Figure 1.7, a working parent named Dan walked on the uneven ground of daily life and, all the while, carried his work and family tasks and demands. What is not visible, perhaps as much to Dan as those around him, were the mind wandering thoughts within his working parent mind. When Dan closed his laptop, straightened his back, and looked out the window, was he still in his task or was his mind somewhere else?

Figure 1.7

Working Dad You See. Working Dad Mind Wandering.
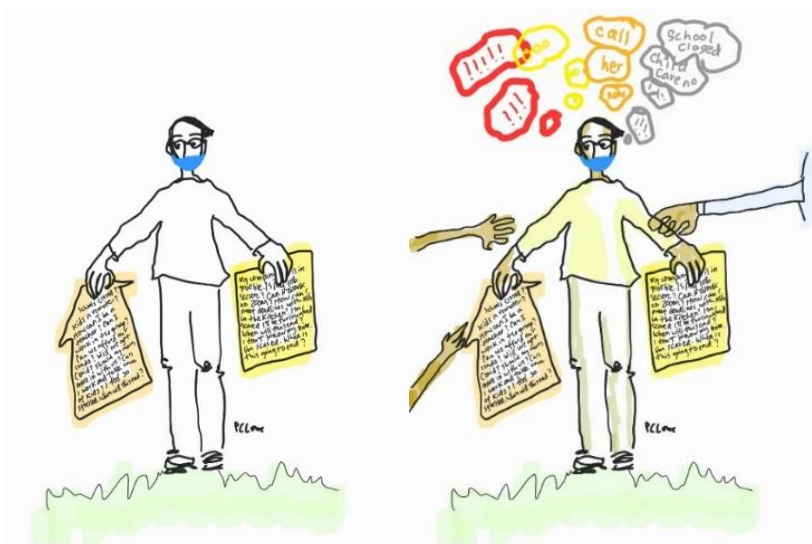
Note: *Working Dad You See. Working Dad Mind Wandering.* Copyright 2022 by Paula C. Lowe.

A Sample Not in a Lab

As previously stated within this chapter, leaders who recognize that they are leading "whole persons" need information pertinent to the population they serve. The mind wandering in daily life of working adults ages 25–50 has not been the focus of research. Predominantly, investigators have studied the mind wandering of late adolescent university undergraduate students doing contrived tasks in lab settings for college credit. This has been understandable for research seeking to standardize for participant-level data analyses.

Life in the great outdoors is messy. Yet we need to venture forth because university lab research designs cannot tell us about day-to-day life and may have generalizability issues for two reasons. For one thing, researchers have asserted that mind wandering rates fluctuate across the day (Smith et al., 2018) making sampling for an hour insufficient to account for this fluctuation. For another, research using a convenience sample of late adolescent-aged college students may not have produced results comparable to a working adult sample ages 25–50 as the human brain

is not fully developed until age 25 (Pujol et al., 1993). We do not know if the responses of late adolescent subjects gave us mind wandering findings that are also descriptive of the mind wandering of working adults. Without a focused inquiry, the mind wandering of working adults may be mis-aggregated and assumptions about its frequency and negativity may be inaccurate (Copeland, 2017).

<center>**Study Variables**</center>

This section provides a short introduction to mind wandering, intentionality, and the six descriptive variables used in this research to characterize mind wandering episodes. These are more fully presented in Chapter II.

Mind Wandering

Mind wandering was defined as an individual's thinking that was not about what her or she was doing. Within the research, mind wandering has been consistently defined across research inquiries. It has been described as when the individual's conscious experience is not tied to the events or tasks one is performing (Seli et al., 2018b). Other terms have included daydreaming (Antrobus et al., 1966), self-generated thought (Smallwood et al., 2011), spontaneous thought (Christoff et al., 2016), and spontaneous cognition (Andrews-Hanna et al., 2010). "Having one's attention diverted away from the current task is such a common activity that estimates suggest nearly 30%–50% of waking conscious experience is occupied by thoughts unrelated to a primary task" (Franklin et al., 2013). Mills et al. (2018) surveyed the bounty of mind wandering research and the loose agreement on definitions, most emphasizing an aspect of mind wandering or even the dynamics, e.g., that mind wandering is a freely moving thought across possible mental states (p. 21). Kane et al. (2017) cautioned that the investigation of mind wandering in laboratory settings might be incomplete when considering mind wandering as

experienced in daily life in which respondents are not in a single environment with controlled exposures to contrived tasks. The instruction for researchers from these sources was that we must be explicit about the definitions used in a particular study. As well, researchers should assure that they have asked respondents to differentiate between intentional and unintentional mind wandering as this difference is central importance to this field of inquiry (Seli et al., 2016a).

To say someone is mind wandering because she is "off task" requires the term "task" to be defined. Task was defined in this study as any kind of activity a participant was doing, self-directed or other-directed, at the time of the notification. It could be running a 10k, typing on a computer, cutting up vegetables, or other common activities in daily life. Certain researchers stated that "tasks are concrete routines enacted through a series of coordinated, congruent actions to facilitate goals" (Murray et al., 2020). However, people experience all sorts of activities that are far from glorious and coordinated, i.e., scrubbing a pan, waiting for a bus, sitting in a meeting. Tasks may also be nested, e.g., scrubbing a pan while listening to music. Understanding the definition of task used in a particular study is important for credible mind wandering research (Murray et al.). Since "task" is so associated with productivity, I limited my use of this term in this study's experience sampling questions.

Intentional and Unintentional Mind Wandering

Intentional mind wandering has been said to occur when an individual is open to or wants to mind wander. The intentionally mind wandering individual's conscious experience untied from one's activity or context as a person chose to think about something other than what he or she was doing. Research reported that this happened more often when task demands were low, motivation to complete a task, regardless of complexity, was low, and/or the task was repetitious

or monotonous (Seli et al., 2016b). This study investigated whether this low demand state was reported for working adult intentional mind wandering episodes (see Chapter IV).

Unintentional mind wandering has been said to occur when the individual did not choose to mind wander but was doing so nevertheless. The mind wandering was experienced as "popping up." Golchert et al. (2017) researched the brain's activity during intentional and unintentional mind wandering to show that spontaneous mind wandering differed from intentional as to the parts of the brain that are used and how these cooperate. The findings from Golchert et al. validated that unintentional mind wandering was a phenomenon that the brain engaged in given certain conditions, i.e., sustained high demand task, low executive control, and localized stimuli. This study investigated whether this high demand state was reported for working adult unintentional mind wandering episodes (see Chapter IV).

Descriptive Variables

In this study, I selected and ordered six descriptive variables that informed the mind wandering episode reports. Chosen because they have been researched in the field in other studies, these were translated into the quick items that followed the two mind wandering frequency questions in the one-minute mind wandering survey. The six variables were thought type, content, temporality, context, context demand, and emotion. Thought type choices were *about day-to-day things*, *creative or interesting experiences*, *things to figure out or plan*, *concerns or worries*, and *other things not listed*. Thought content is a term that has been used in research to identify what the subject mind wandered about. Research has established that mind wandering thought content may be different for intentional and unintentional mind wandering (Seli et al., 2017a). For this study, the term "thought content" was used because the term "current concerns," sometimes used in other studies, suggested anxiety and worry as the word "concern"

is a synonym for anxiety and worry. "Thought content" in this study referred to whether the mind wandering thoughts were mostly related to *my work*, *my children*, *other family members or friends*, *myself*, or *other things not listed*.

Temporality in this study was about the mind wandering experience time frame. The choices were *past*, *present*, *future*, or *never happened*. Researchers have looked at temporal focus and self-reflection in mind wandering (Smallwood et al., 2011) and posited that intentional mind wandering was more often about future events and prospection; unintentional mind wandering was more often related to past events or retrospection. Context and context demand were important aspects of the mind wandering experience in this study. Context choices included *doing things mostly related to my work*, *my children*, *other family members or friends*, *myself*, or *other things not listed here*. These choices paralleled thought content. Context demand was reported as *very demanding*, *demanding*, *somewhat demanding*, and *not demanding*. Lastly, the descriptive variable of emotion referred to the feelings experienced at the time of sampled mind wandering, including feeling *great*, *very good*, *pretty good*, and *not so good*.

Methodology

For this quantitative experience sampling study, a convenience and snowballed volunteer sample of adults ages 25–50 working and living in the United States was assembled using Facebook ads. These participants used the Expiwell experience sampling smartphone app on their smartphones to report the frequencies and descriptive variables of their mind wandering episodes when they were randomly notified across up to five days. After data cleaning, I analyzed the mind wandering episode data reported by 427 participants for frequency of mind wandering, intentional and unintentional mind wandering, using both participant-level and episode-level analyses. I used episode level analyses to investigate characterizing variables.

Working adults responded to 7,947 notifications and submitted 4,294 mind wandering episodes

reported by parents and nonparents, and further by gender. To further examine the episode data, I

linked variable data, e.g., content and context, to explore episode-level findings. Finally, I

reviewed 614 episode-level comments by thought type and intentionality. I also reviewed 303

non-mind wandering episode comments given at the time of notification.

Organization of Dissertation

This dissertation has five chapters. In Chapter I, I have offered an introduction to the

history and context of mind wandering, study purposes, significance of the study, researcher

background, sample, study variables, and methodology, and organization. In Chapter II, I

provide a critical review of relevant theory, research, and practice to situate this dissertation

within the field of mind wandering research, demonstrating the ways in which this dissertation

flows from the progression of study in the field. The literature review begins with thought

leadership, strands of relevant mind wandering research, methodologies used to examine mind

wandering, and certain validity issues of self-reported data about an individual's thinking. It

offers the roots underneath the definitions used in this study. In Chapter III, I describe the

process of collecting data using experience sampling for a Facebook ad generated national

sample of working adults in the United States and the In Chapter IV, I present preparing the data

for analyses, mind wandering frequency participant-level and episode-level data findings,

descriptive variable data analyses, linked variable data analyses, and episode comments. In

Chapter V, I relate the five key study findings to the literature, provide methodology findings,

describe study limitations, and offer recommendations for further research.

CHAPTER II: REVIEW OF LITERATURE

The idea of a single, central Self doesn't explain anything. This is because a thing with no parts provides nothing that we can use as pieces of explanation (Minsky, 1986/2014, p. 50).

Within this chapter, I have built a case for conducting experience sampling daily life research focused on the "not about what I was doing" thinking of working adults, particularly comparing the self-reported mind wandering of parents with that of nonparents and by gender. I present literature that not only describes mind wandering research but also the characterizing, relational, and contextual descriptive variables of the mind wandering episode experience.

I begin by describing the working adults I sought for this study, parents and nonparents. I did not decide to study mind wandering and then look around for some people to convince to join my research. The research started with my curiosity about how the dual role of parents shows up in their thinking life, and, similarly, how other aspects of nonparent life might be affecting mind wandering. I was further interested in this role duality by comparing by gender, looking for how male parents compare to male nonparents, dads to moms, and female parents to female nonparents.

Much has been written about family life and parenting this and that, but it struck me as I conceptualized and designed this dissertation, whoever has asked, in a real time study, hey, working adults, parents and nonparents, are you mind wandering right now? In this chapter, I offer literature that informed two aspects of being a working parent. One is the atelic nature of parenting with tasks that repeat over days, years, even decades; the second is the social motivation of kin care, that is, care of one's children, biological or chosen.

I then enter the mind wandering research relevant to this study by honoring the thought leaders who noticed the boy staring out the window, and the 20th century psychologists who

gave language to daydreaming. I describe mind wandering definitions that came out of a family

of resemblances that allowed for different emphases and directed researchers to put these on the

table. As mind wandering was established to be a frequent thought process, researchers took

pieces of it apart, i.e., when was it likely to occur, what was it about, was it related to mood, did

it step into the past or future. The literature has strongly shaped, even determined for me, the

methods and quest of my dissertation. In sum, this chapter funnels selected studies that informed

gaps and opportunities for my research.

Working Adults: Parents and Nonparents

I designed my study to explore the mind wandering of working adults ages 25–50 living

in the United States. I investigated two conditions, parents and nonparents, to observe whether

working parents, having "two jobs," reported episodes of significantly more mind wandering and

whether that mind wandering varied from nonparents by thought type, content, and so on. When

onboarding the study, participants identified themselves by answering yes, I am a parent, and

further, describing their parenting situation. Nonparents identified themselves by answering no, I

am not a parent. This section presents parent and nonparent definitions and two distinguishing

qualities of being a working parent.

In Chapter I, I cited formative shared experiences affecting working adults in the United

States over the past three decades—recessions, the Big Recession, 9/11, endless wars, social

justice, climate change, gun violence, college debt, inflation, employment shifts, automation,

rising costs, health care affordability, mental health, drug addiction, and, most recently, the

Covid pandemic. These have affected nonparents, even their choices to partner and become

parents. Figure 2.1 depicts Maria and Trevor on the job at a warehouse where Trevor is working

and mind wandering. They are two of the millions of working adults in demanding jobs who may be working and, from time to time, thinking about something else.

Figure 2.1

On the Job at a Warehouse … Mind Wandering.

Note: *On the Job at a Warehouse … Mind Wandering.* Copyright 2022 by Paula C. Lowe.

In recent years, working parents have experienced a "hands full" dynamic. Thoughts of work and homelife flowed back and forth as these working parents moved between their dual responsibilities. As mind wandering could happen while working, it could also happen while with children. As in Figure 2.2, a mother might be reading to her child while "visions of work danced in her head."

Figure 2.2

Visions of Work Danced in Her Head

Note: *Visions of Work Danced in Her Head*. Copyright 2022 by Paula C. Lowe.

To understand the term working + parenting, referred to as "parent status" for this study, it was important to take it apart. Parenting is distinguished from other relationships by its nature. From the time a parent had a child—by birth, adoption, blending families, or fostering—that parent was no longer alone nor able to be completely self-referent. To appreciate this big change in life, I considered that parenting could aptly be understood as atelic (Irving, 2016, p. 83). Irving differentiated between what was telic and atelic. Telic events came to an end point while atelic events did not (p. 79). The atelic nature of parenting is its open-endedness. Despite the legal declaration that parenting ends when a child is eighteen, parenting is perpetually unfinished and forever. Consider the attributes of parenting that make it so. When feeding a child, one makes a meal only to make a meal for years and years and years. The same is true of keeping a child safe. From the fragility of the newborn to the late teen, a parent provides and supervises a child's physical and mental safety. The parent continuously helps a child form his or her identify while

supervising identity formation in the world beyond the family. From childcare to school to community participation, a child and parent are both "not done" in their work of relationship.

The second aspect of parenting relevant to this study is that human social motivation researchers (Ko et al., 2020) have asserted long-term familial bonds and kin care to be the primary motivation for all people. Their kin care definition focused on the care of children. In their analyses of data from 27 societies around the world, Ko et al. found that people associate taking care of their families as a motivating force in having a meaningful and fulfilling life (p. 174). "Children across societies are unable to produce the calories they need to consume until they are approximately 15 to 22 years old" (p. 186). The authors said that raising children required attentive and extensive cooperation to give the young what they needed to grow. We see this in Figure 2.3 as this drawing illustrates the overlap of work and parent life for Denise and her children, Brandon and Cherie and their pet rabbit Hank.

As children journey through eighteen supervised years into adulthood, parenting adapts to the stages of caring for children over and over. Thus, parenting is inescapably atelic, and continuously incentivized by kin care, a bond between children and parents. Ko et al. stated that it would be valuable to investigate how "interacting with kin and being motivated to care for kin might alter many well-known social-psychological phenomena" (p. 190). In my study, I explored participants' reports for evidence of human social motivation of kin care by asking about *my children* as well as *other family members and friends* as to thought type and practical thoughts thinking that revealed atelicity.

Figure 2.3

Work + Parent (Featuring Denise, Brandon, Cherie, and Hank the Bunny)

Note: *Work + Parent*. Copyright 2022 by Paula C. Lowe.

It was a humbling time to conduct research with working adults. Millennials, those ages 25–42, comprised two of the three age groups in my study. Millennials are the largest generation in the United States with over 72 million individuals, as the subjects of this study. Millennials have constituted 35% of American workers (Fry, 2018, p. 1). Historically, working parents have made it through big hard times and made the choice anyway to raise children. Yet fewer Millennials have been choosing to raise children within the traditional structure of American family (Campbell, 2016). When the Covid shutdowns began in March of 2020, only three in ten Millennials lived with a spouse and child (Barroso et al., 2020, p. 2). The largest generation in the U.S. full-time workforce in 2019 (Van Dam, 2020, p. 1), Millennials were let go in record numbers due to the Covid 19 pandemic in 2020. Working moms left the workforce in the fall of 2020 when schools did not reopen. *The New York Times* observed, "it's impossible to hide what has always been true: raising children is a round-the-clock responsibility" (Miller, 2020, p. 1). In

a segment for PBS on impossibility of working from home while supervising children, Santhanam wrote, "It doesn't help that they (working parents) must stare down the same uncertainty every day, that 'everything could change in a moment'" (2020, p. 7).

Thought Leaders Who Homesteaded the Field of Mind Wandering

"If I have seen further it is by standing on the shoulders of giants," was attributed to Isaac Newton (1675), and before him, Bernard of Chartres, and Isaiah di Trani of the 12th century. I have Newton's quote on my refrigerator. Certain thought leaders of the 20th century provided shoulders upon which mind wandering became a field of inquiry. The early decades of the 20th century were about working hard and making a better life for your family. Between world wars, there were depression and recession. Immigrants struggled to speak English; newly consolidated public schools brought children together to learn. Mind wandering was not the show. If a boy was a daydreamer, he was a lazy kid. If a mother let her thoughts flow, she might burn the soup.

Just after the pandemic of 1918–1920, Wallas published *The Art of Thought* in which he conceived of the mind "taking its gaze off-task" (1926). He posed four stages of the creative process, including "the stage during which one was not consciously thinking about the problem, which I shall call Incubation" (p. 80). Wallas valued the unconscious contribution to thought process and posed that there were thoughts of which the individual was not aware or perhaps not controlling. In a time when he would have written his book with pen and ink on paper, Wallas wrote that "that which might have led to the 'flash' of success, and the final and successful train are normally either unconscious or take place … in that periphery or 'fringe' of consciousness which surrounds our 'focal' consciousness as the sun's 'corona' surrounds the disk of full luminosity" (p. 95).

Thought leader Alfred North Whitehead (1938) wrote, "We are in the present; the present is always shifting; it is derived from the past; it is shaping the future; it is passing into the future. This process is an inexorable fact" (p. 53). Our thinking brings together decades of living and experience. We enjoy such thoughts as a child's first steps or a day when we had a meaningful conversation with an older friend. Whitehead acknowledged that we move around between past, present, and future, and that this is a fact, a normal fact. Much later, developmental psychologist Kegan (1982) said, "we are not the self who hangs in the balance at this moment in our evolution. We are the activity of this evolution." (p. 169). Yet not a page acknowledged that a person could think away from the task at hand. Similarly, Bandura's (1986) writings on the social foundations of thought and action were detailed about the human endeavor to think through and accomplish work but nothing on the mind off task.

It was Singer who conferred permission to daydream. His contributions to the study of spontaneous thought came of a life that spanned from 1924 to 2019, from before landline phones to after iPhones, from pandemic to pandemic, his service in World War II paying for his education. In *Navigating the Stream of Consciousness: Research in Daydreaming and Related Inner Experience*, Singer (1975) advocated for research into daydreams (p. 727) and discussed a conceptual model for studying stream of consciousness. He wrote that the mind has "space left over to attend to the continuing activities of our long-term storage system and to process those memories again" (p. 728). To paraphrase, Singer held that the brain was optimized to make room for thoughts beyond a task. He added, as if a presage, "I can confidently predict that anyone reading this article will at some point drift away" (p. 729) as research concerning mind wandering now measures attention to reading tasks.

In the mid-20th century there was a push for public education with children in rows of desks before blackboards. Singer and his colleague and wife, Dr. Dorothy G. Singer, guided the development of creative television to develop children's imagination. They championed spontaneous, self-generated thought and creativity by valuing and modeling. Singer's term "daydream" has given way to mind wandering, spontaneous thought, and self-generated thought. Jerome Singer's (1975) questions, "Does everybody daydream? What are the different patterns and styles of daydreaming? What are some of the background factors that may lead to differential styles or reports of frequency of daydreaming?" (p. 729) are the foundation for the questions in this study. Singer posed a positive use of daydreaming and his research gave evidence that daydreaming, imagination, and fantasy were healthy and satisfying parts of mental experiences (McMillan et al., 2013, p. 3). His work may be manifest in the lives of working parents who ate their morning bowls of cereal watching Big Bird and Cookie Monster.

Klinger claimed that we think about what matters to us personally. Known for his work in support of the current concern hypothesis, Klinger (1971, 1975) posed that humans mind wander primarily about matters of self-importance. There is, of course, a universe in the phrase, "matters of self-importance." For one individual, dinner will be gotten after working out and her mind wanders to the gym and how to use the weights before others arrive; another will be making dinner quickly for four hungry children who must first be picked up from school. His mind wandering might be about the route to take to avoid heavy traffic on the freeway home.

Klinger and Cox (1987) investigated three criteria of daydreaming to gauge how properties of thought flow were distributed during everyday activity for undergraduate university students. This well-known study brought forward three definitions for daydreaming—an episode was in some way at variance with reality, stimulus-independent, or unintentional or undirected.

Important to my research, Klinger and Cox's experience sampling used a beeper for seven days to prompt subjects, during their daily lives, to describe their consciousness using thought sampling questionnaires. The students numbered 29 and generated 1,425 occasions in which they responded concerning their thoughts. Student submissions varied from six to 176 per participant. Klinger and Cox's methodology helped to establish research in natural settings. The authors said that "any attempt to integrate the whole 'daydreaming' literature as if thought were unitary would mix apples with oranges" (p. 107). This advocation for a rich and contextual definition of daydreaming, and subsequently mind wandering, led to the "family resemblance" definitions of mind wandering that continues to inform research including mine.

Giambra (1989) investigated daydreaming as a function of age. He stated, "for most people, daydreaming and mind wandering are an accepted, usual part of their daily mental life" (p. 136). He again noted that Western cultural norms had a negative view of daydreaming and mind wandering. However, there were circumstances in which these were advantageous, and other times when daydreaming and mind wandering could be a source of new and useful ideas. His poetic sense of daydreaming was phrased, "thoughts unrelated to task emerge unbidded into awareness and temporarily capture it" (p. 137).

Significant to my research objective to differentiate between intentional and unintentional mind wandering, Giambra separated daydreaming, unintentional thoughts, and mind wandering that included thoughts unrelated to the task at hand but also occurring with intent. He investigated age-related daydreaming/mind wandering with subjects ranging in age from 17 to 92. Studying task-unrelated thoughts, Giambra devised vigilance tasks across five experiments in a lab setting. While his results pointed to nonsignificant interaction of age and event rate, his discussion brought forward that task-unrelated thoughts could not be simply represented as the

re-emergence into consciousness of prior conscious thought that had passed into nonconsciousness. In other words, task-unrelated thoughts were not just bones buried somewhere in a backyard, lost under the winter snow, and then dug up by the mind in the spring. While my research did not specifically investigate recurrence in thought type and content, the high percentages of reported episodes about *day-to-day thoughts* or *my children* or *myself* suggested recurrence, again, as Klinger (1971) claimed, that we think about what matters to us personally.

Giambra (1989) posited that task-unrelated thoughts should be understood as endpoints of a series of thought processing happening within the nonconscious mind (p. 142). The idea that unrelated thought could be part of recurrent "unfinished business," as Giambra referenced in Klinger's 1971 research, highlighted that interrupted thoughts could come up in later task-unrelated thoughts. While Giambra was looking at task-unrelated thoughts with age as the independent variable, the discussion about unfinished business in a subject's life situation was relevant to my own investigation of working adults reporting many episodes with the same thought content during mind wandering. While beyond the scope of my study to ascertain this unfinished business, however, I better understood my study findings as to content and thought type by considering that mind wandering about content, e.g., a teenager who applying for college, is not fixed but rather a fluid topic that may be revisited and unfinished consistent with Giambra's discussion of recurrency.

In sum, these thought leaders helped a young field move from theoretical constructs to researchable hypotheses. Technology advances have made research in mind wandering more feasible and insightful. For one, biomedical engineering made the use of magnetic resonance imaging an investigative tool for understanding the activities of the brain. This allowed researchers to bring together the neuroscience of brain activity research with self-report research.

As well, the field of mobile device technology enabled notifying participants through apps on smartphones a minimally disruptive research methodology. Experience sampling apps, such as the one used in this study by Expiwell, have been designed for participant privacy and ease of participation.

The Quest to Define Mind Wandering

Defining mind wandering in my study began without narrowing too soon. This field of research has had variations of emphases in definitions and points of view about those definitions. Researchers have posited that mind wandering was best understood in relation to task, self-generation, unguidedness, intention, context, spontaneity, movement, and other pieces of the human thought puzzle. These could have resulted in my designing an overly complicated study that tried to embrace the field's many moving and interchangeable parts while embracing none of them well. Instead, I was informed by Klinger (1971) whose writing instructed me to always remember that we think about what matters to us personally (p. 147) as this distilled my study's definition for a national working adults 25–50 years old population, so what I was asking was clear, simple, and recognizable. Accordingly, my first survey question was in plain speak, "in the last few minutes, I was mind wandering about things not about what I was doing." Yes or no.

This section explains why researcher' specific choices of definition of mind wandering have not been a one-size-fits-all and how the field of inquiry resolved to conduct research given this unfixable reality. The extant research on mind wandering has not compiled into a neat pyramid or timeline of discovery. My presentation of studies and papers demonstrate the many sources that shaped my definition decisions.

Task-Centric Definitions

While mind wandering has been defined as when an individual's conscious experience was not tied to the events or tasks one was performing (Seli et al., 2018b), that conscious experience was further described as shifts in attention away from a task toward the individual's internal information (Vannucci et al., 2017, p. 61). Mind wandering was established as a common brain activity that involved thinking about things, people, and experiences not present in time or place. Task unrelated thinking was reported to occur during 30%–50% of adult waking time (Franklin et al., 2013; Killingsworth & Gilbert, 2010).

Christoff et al. (2016) defined mind wandering as spontaneous thought and argued that mind wandering should be valued as a part of a family of spontaneous-thought phenomena that included creative thought and dreaming. They explained that until the 1990s, cognitive psychology focused on task-centric mental processes, and mind wandering came to have a task-related and/or stimulus-related definition. To understand mind wandering as more than an on or off state, Christoff et al. asserted, "To say that one's mental states are task unrelated or stimulus independent tells us nothing about how such states arise or change over time" (p. 719). Christoff et al. defined spontaneous thought as a mental state or sequence that happened relatively easily because there was "an absence of strong constraints on the contents of each state and on the transitions from one mental state to another" (p. 719). The authors described two types of spontaneous thought. One type was described as constrained thought as flexible and deliberate, operable through cognitive control. The second type was portrayed as automatic where, despite individual effort, a person could be unable to stop paying attention to an object, sound, or preoccupying thought. The authors reasoned, within their framework, that mind wandering could be defined as a special case of spontaneous thought. Within this range from

deliberate to automatic thought, the authors defined mind wandering as a special case of spontaneous thought because, compared to dreaming, it was more deliberately constrained.

Thought Movement

In defining mind wandering, movement of thought has been original even in naming of the phenomenon, "wandering." The issue of thought movement and recurrence has been considered in mind wandering research and definitions. Christoff et al. (2016) posited that it was important to separate mind wandering from rumination, a stuck kind of thinking associated with worry. They said, "thoughts during mind-wandering are free to 'move hither and thither,' thoughts during rumination tend to remain fixed on a single theme or topic" (p. 719).

With the authors' emphasis on movement of thought, I considered, in designing this study, that a working adult might have recurrent mind wandering thoughts due to the ongoing nature of day-to-day responsibilities, as previously discussed in relationship to Giambra's research. For a working parent, thoughts related to dealing with an illness, marital conflict, loss of childcare, daily meal making, picking children up from school, and times of fatigue could be repetitive. For a nonparent, thoughts related to a friend having problems, a health issue, how to take care of an elderly parent, and when to leave work could similarly be repetitive. However, I viewed such mind wandering content as congruent with an expected atelicity of adult life, working parent life in particular, not as rumination. Further, a recurring thought may have moved along as the content was moving, i.e., Mia's fever broke but this little girl was still at home recovering. Similarly, a mother's recurring mind wandering about setting up a desk area or remembering her living room full of boxes may be better characterized as "day-to-day things I need to do," or "things I'm trying to figure out or plan." A nonparent might mind wander about buying a car and these thoughts would change as the possibilities came together. For the

nonparents, recurring thoughts may also occur. Job responsibilities, paying off student debt or dealing with housemates, planning for a vacation or taking care of an illness, these thoughts may happen again and again without rumination being the cause of them.

Christoff et al. (2016) anticipated this distinction when they noted that types of thought marked by a high degree of automaticity, such as obsessive thought, are a clearly distinguished form of rumination, but said, "our framework can also tease apart antithetical phenomena such as mind wandering and rumination which seem to be indistinguishable if we focus on the static contents of thoughts to the exclusion of its dynamics" (p. 728). The attention paid by Christoff et al. to the issue of recurrence and movement of thought was relevant to my study as I included a thought type item. I asked respondents to select a descriptor for their mind wandering episode thought type, i.e., *day-to-day things I need to do*, *things I'm trying to figure out*, and *concerns or worries*. The purpose of this item was not only to highlight the recurrence of thought types, but that daily mind wandering thought type may be, quite often, about day-to-day topics.

External and Internal Contexts

Seli et al. (2018b) wrote about the process of defining mind wandering and presented a family-resemblances view of mind wandering that encompassed a range of complementary, not competing, definitions used in research. These included task-unrelated thought, unintentional thought, stimulus-independent thought, meandering unguided thought, and stimulus-independent and task-unrelated thought. The authors asserted that a family-resemblances framework was meant to encourage researchers to identify the mind wandering features of their studies, both for participants and readers (p. 488). Seli et al. stated that since natural categories could have boundaries not plainly defined, it was important to attend to context in definitions. The authors stated that if mind wandering varieties behaved differently, as evidence suggested that they do,

"then researchers who ignore their diversity may lead their work into underspecified or erroneous conclusions" (p. 486). They continued by asking how different external contexts or internal contexts differentially evoked distinct varieties of mind wandering.

Seli et al. (2018b) listed a question in their Outstanding Questions Box that influenced the questions I asked in my study. That is, "Do different external contexts (e.g., daily life at work or home) or internal contexts (e.g., emotion) differentially evoke distinct varieties (types) of mind wandering?" As my study was exploratory, I did not address this question per se. But I did investigate types of mind wandering, intentional and unintentional, and for episode data about content, emotion, context, and demands at the time of mind wandering to explore some aspects of this question for my research.

This brings forward Singer's question from decades ago, "What are some of the background factors that may lead to differential styles or reports of frequency of daydreaming?" While I return to this big question in the descriptive variables section of this chapter, I note that Singer's query and comments by Seli et al. comments informed the items I included in my study. Mind wandering was often reported in my study as about *day-to-day things I need to do* thus giving evidence of the atelic or ongoing nature of mind wandering itself. While parents and nonparents mind wandering may have recurrent content, that is not an indication of fixed thought as in rumination. Rather, people mind may wander about common elements in personal life that are by nature recurrent. You know, go to sleep, get up, get the kids up, make breakfast, yell for everyone to get in the car or we're going to be late, hurry, grab lunch boxes, hurry, drive, sit in traffic, drive, get to school, hug and kiss, drive, drive, and so on.

Discussions Underlying This Study's Definition of Mind Wandering

Understanding construct definitions within a research field has meant that I have appreciated the discussions between researchers within that field, i.e., listening to Christoff et al. and Seli et al. on their points of definition. Christoff et al. (2018) voiced concern that when mind wandering was "used as an umbrella term, disparate types of thought may unintentionally promote overgeneralizations" (p. 958). Research that was specific in its work could help determine which mind wandering variants most frequently co-occur and under what conditions (pp. 959–960). Seli et al. (2018b) responded that mind-wandering was a cluster concept within which different kinds of mind wandering operate. The issue, they posited, was that the field cannot take a "necessary-features definition approach" and researchers were obliged to identify the type of mind wandering studied so that the field continued to determine which varieties of mind-wandering occur in various conditions (p. 2).

This dialogue was foundational for my research in two ways. It informed my understanding as to mind wandering descriptive variables, e.g., emotion and temporality, that may co-occur, and mind wandering context and context demand for working adults. Secondly, the researchers spoke to the origins of task orientation. Understanding and putting into words what constituted "on task" and "off task" thinking was not a simple matter for me. I chose to reduce my reference to the term "task" because of its deep roots in productivity judgments and insinuation of what activity was worthy of being called "a task." For participants at the time this study was conducted on the heels of two years within the Covid pandemic, task was particularly multi-layered. As an example, the activity for the working parent might have been to read a work-related report at home. Yet that context increased in demand when a teenager attending school virtually was set up at the other end of a kitchen table. Was the activity to help a teen

understand an algebra assignment or finish an email to a team? At which point did the task move from one domain to the other? When participants need to overly construe their situations to ascertain if they are or aren't mind wandering, reflective thinking may obfuscate answering the original question, were you mind wandering?

In sum, the field has shifted from definitions that are about the effect of mind wandering on something else, e.g., productivity, to definitions that focus on the personal experience, e.g., not thinking about "what I was doing." In hundreds of studies across the past 20 years, researchers expanded their inquiries to definitions that recognized facets of such thinking as spontaneous and other-focused. Christoff et al. wrote that mind wandering was a "mental state with contents that are task unrelated or stimulus independent" (2016, p. 718). While researchers continued to cling to the "wandering" of mind wandering, i.e., thought that moves "hither and thither" (Christoff et al., 2016), such language seemed to me to infer that mind wandering was something fly-like. But the common fly evolved its movement to search for food and escape from danger, a purposeful and self-motivated behavior that only appears random to humans. Perhaps the ongoing discussions, deconstructions, and examinations of mind wandering serve the essential research purpose of keeping investigators from putting this marvelous capacity of the mind—to experience thought in other time, place, and experience, to split from the moment at hand—in subjectively rigid and small boxes.

Intentionality

Two types of mind wandering differ in their manifestations. Intentional mind wandering applies to when you "want or are open to" mind wander, perhaps while you have a moment to spare, say when you are vacuuming a rug or sitting on a bus. Unintentional mind wandering is recognized as when a person's thoughts seem to "pop up," e.g., an ad for jeans in your junk

emails, perhaps showing up more often in high demand or sustained activities when one's concentration is weary of high demand. But researchers learned there was more to these distinctions than just two baskets of laundry, one with socks and the other with shirts. We needed to know the researched criteria for sorting.

Seli et al. (2016a) examined the importance of distinguishing between intentional and unintentional mind wandering in their review of studies. They discussed research indicating these types were linked with specific individual differences variables and differentially influenced by specific experimental manipulations. They shared findings that subjects who frequently reported intentional and unintentional mind-wandering in daily life also frequently reported these during laboratory behavioral tasks. Their results provided important construct validity evidence (p. 607) for studies conducted in the lab and in natural settings. Of note, Seli et al. (2017a) later discussed whether intentionality and meta-awareness of mind wandering are the same and inspected assumptions about what a participant was doing at the time he or she was prompted to self-report, for example, only sort of engaged in a task.

Seli et al. (2016b) investigated context factors for intention. These were the demands of the task, whether you are at work or at home, whether you liked what you are doing, and so on. The first context factor they studied was motivation, showing that the higher a subject's motivation to do well on a particular task, the lower the rate of intentional mind wandering during that activity (p. 608). While the authors cautioned, "the standard practice of conflating intentional and unintentional mind-wandering will likely produce underspecified or even incorrect conclusions," the type of mind wandering continued to matter for findings to be properly interpreted (p. 609). Motivation to do well was part of the complexity and value of the task. Although investigating motivation was beyond the scope of my exploratory study, I did

consider the social motivation of kin care, that is, the content of reported mind wandering being about *my children* or about *family members or friends*.

In a separate study, Seli et al. (2016b) investigated both types of mind wandering to support the importance for researchers to distinguish between intentional and unintentional mind wandering. Undergraduate students completed easy and hard tasks to measure a subject's capacity to withhold responses to unpredictable and infrequent stimuli during a time of rapid response to frequent stimuli (Robertson et al., 1997). The results showed notably different distributions of the two types of mind wandering with the easy condition having increased intentional mind wandering and the difficult condition having increased unintentional mind wandering. The authors asserted that if they had ignored the difference between intentional and unintentional mind wandering, they would have drawn the wrong conclusion that mind wandering frequency remain unchanged despite different conditions (p. 756).

When considering how to determine if intentional or unintentional mind wandering was occurring, researchers were beholden to the subjective nature of respondents' self-reports. Thus, it was of particular interest for my self-report research that Seli et al. (2016a) cautioned researchers that data dependent on participants' self-reports was inherently based on self-generated criteria. The authors warned this concerned all self-reported mind wandering research, in labs and in natural settings. That is, while the methodology for thought probes was standardized and randomly administered, the state of mind of the respondent at the time of the prompt and subsequent questions varied from person to person. Response was dependent on the individual being constantly self-aware and able to assess her or his state of mind. The authors advised that a certain skepticism needed to be consistently applied (p. 689) to self-report generated data. I kept this in mind as I designed my research, keeping communication,

directions, questions, and experience sampling process as simply stated and least interruptive as possible to reduce participants' self-report situational fatigue and "mind shifting" into self-examination about episodes.

The concern expressed by Seli et al. (2016a) as important for working adult mind wandering in daily life research. Research in earlier mind wandering studies did not consistently distinguish between intentional and unintentional mind wandering in asking questions or designing studies. Certain research then showed these two types of mind wandering to be associated with different contexts, mood, content, temporality, creativity, and other factors (Seli et al., 2016b). This study shows that intentionality of mind wandering was important when investigating thought type, content, and temporality as reported in Chapter IV.

Temporality, Self-Reference, and Intentionality

An important reason that intentional and unintentional mind wandering must be identified in research concerns temporality. In another lab-based study, Seli et al. (2017a) found intentional mind wandering associated with significantly higher reports of future-oriented thinking (p. 152) that were then associated with positive mood. For intentional mind wandering to be associated with higher reports of future focus, it followed from this study that intentional mind wandering, by virtue of temporal focus, was more positive in its effects on the subject. However, temporal focus that is future oriented does not assume a "rosy picture." Future-oriented mind wandering can also be anxious as anxiety is an emotion elicited by concern about something that could but has not happened yet. Future-oriented mind wandering about weekend plans to go to the zoo might evoke happy anticipation or anxiety; mind wandering about yesterday's bus stop goodbyes might trigger regret or a sweet memory. Not all memories are negative; not all future events are joyous.

Intentionality, temporal focus, and self-reflection were the focus of the research by Smallwood et al. (2011) on intentional mind wandering and future events. Their two experience sampling studies described the extent to which self-reflection affected retrospection, consideration for the past, and prospection, consideration for the future, in mind wandering. Their first study involved the self-reference effect. Participants were asked to rate whether certain trait adjectives applied to a referent. When asked to remember information that was related to themselves, recall was stronger (p. 1121). The researchers found that if self-reflection was employed prior to doing a task, the subject tended to focus on the future rather than past during mind wandering. In the second study, individual variation in self-reference effect and incidence of future-oriented thought while mind wandering included looking at the participant's mood. The findings generated in the studies by Smallwood et al. supported the connection between self-reflection and prospection during mind wandering (p. 1125). The researchers said these data stated that benefits from mind wandering appeared when subjects were forward-thinking. A self-reflection period increased the probability of future-orienting events informing mind wandering. When respondents were in the self-referential condition rather than "familiar other" condition, individuals more often looked to the future.

The relevance of the study by Smallwood et al. (2011) for my research was that I asked participants about episode temporality. I appreciated that their self-reference would come out of their identities as worker, parent, friend, family member, etc., and the one of these most dominant at the time of the episode sampling. This was picked up by asking about episode content, e.g., *my children* as content corresponds with a parent mode self-reference.

Intentionality Related to Creative Thinking and Problem Solving

Intentionality has been related to creative thinking and problem solving in mind wandering research. Smeekens and Kane (2016) investigated the benefits of controlled versus spontaneous thought in the creative process. They devised three experiments involving university students enrolled in introductory undergraduate psychology courses receiving extra credit for their participation. The first experiment had 142 completing students and concerned whether incubation improved divergent thinking because it promoted mind wandering. Participants were randomly probed about their immediately preceding thoughts during short cognitive tasks to identify if they were on or off task, and further if they "zoned out." The second experiment changed the incubation task and incorporated two personality dimensions about creative problem solving. These were openness to experience and the need for cognition, both using pre-validated instruments. Prior to the third experiment, findings from Baird et al. (2012) describing mind wandering as causal for creativity during incubation for different demanding tasks ranging from high demand to unstructured rest. Smeekens and Kane (2016) distinguished their experimental design from the Baird et al. research and conducted a third experiment, advertising participation for "creative" students and used working memory span tasks, mind wandering assessment, probes and retrospective questionnaires. In so doing, they brought forward issues about which theorists disagreed (p. 391). These were whether mind wandering was automatically triggered by environmental and mental cues to personal goals and concerns, and whether mind wandering represented a failure of the executive control system to block task-unrelated thought. The researchers tested whether incubation, the start phase of a creative process, improved divergent thinking as it promoted mind wandering. The authors assessed personality dimensions, openness to experience and need for cognition related to creative problem solving. Smeekens and Kane

found that "subjects who reported high rates of mind wandering when probed during incubation tasks were no more likely to generate creative ideas than those who reported low rates of mind wandering" (p. 409).

This complex research and findings made me pause to first put these assertions into my own experience frame. Rather than be tested within controlled tasks in a lab, I considered whether I have found mind wandering to be additive during idea generation. For the drawing in Figure 2.4, I had no plan other than to draw something on white space that could appear quickly, say within three minutes. With such a short incubation window, the attributes appeared as if by magic, e.g., oh, she has black hair, oh, she is strong and tall. Perhaps mind wandering was as much a tool as pen and paper.

I provide this drawing to add to the theoretical discussions and research studies I have brought forward. Mind wandering in creative processes may be a tool that artists and writers, musicians and designers learn to hone and harvest with intention. In my research, I found that more creative thought episodes were reported by male parents, one of my four subgroups, during intentional mind wandering. As with other self-report research designs, the need for standardizing participant experience can clean out the variability that is messy but valuable in daily life studies conducted in naturalistic settings. Asking college students questions during and after contrived tasks within a short time does not reveal a full relationship between creative thinking and mind wandering. As Wergin (2020) wrote, "Those in the writing and visual arts may intentionally invite mind wandering as a source of useful disorientation."

Figure 2.4

Mind Wandered Mother and Child

Last modified: Mar 10, 2019

Note: *Mind Wandered Mother and Child.* Copyright 2022 by Paula C. Lowe.

For this exploratory research, I gave participants the choice to characterize their mind wandering episode thought as *creative or interesting experiences*. While this question could not ferret out the complexities of how mind wandering may aid in the creative process, the responses demonstrated that participants often found creative thought was the best characterization of certain of their mind wandering episodes. Within thousands of mind wandering episodes, what if one episode was reported by a dad cooking pasta when his three-year-old brought him a toy backhoe and asked him to put pasta in the bucket to feed the dirt. In an instant, I imagined this dad mind wandering about his childhood toys. We expected that. But what if there was more? What if he mind wandered about a work problem. Of course spaghetti feeds dirt. Of course the building he was designing could be staggered to let more apartment terraces allow more people views of the sunset. Amongst the 614 episode comments reported by participants in this study,

participants reported, "taking my children out for a fun show," and "optimistic about the future. Trying to set up plans to actualize my dream."

Brain-Based Research

Of the ways in which mind wandering has been studied, it is essential to include brain-based research. Golchert et al. (2017) said that "mind wandering has a complex, and often confusing, relationship with executive control" (p. 233). The researchers focused on individual variation in intentionality and considered the integration of the default-mode network, fronto-parietal network, and limbic networks. They analyzed data from 123 healthy volunteers with a mean age of over 26 who had participated in a larger study at the Max Planck Institute of Human Cognition and Brain Sciences in Leipzig, Germany. Using the four-item Mind-Wandering: Deliberate scale and the four-item Mind-Wandering: Spontaneous scale, translated into German for their subjects, participants were inside of the magnetic resonance imaging (MRI) for 62 minutes. (Since I am also inside an MRI for brain scans a couple of times a year for my neurofibromatosis type 2 diagnostics, I know something about 62 minutes inside a "rocket ship" with various blaring sounds alternating with hiss. It is a difficult mind wandering location, speaking from lots of experience, with some of us reacting to the inability to move and others to the claustrophobia of containment.)

Golchert et al. (2017) conceptualized the default-mode network as having the role of supporting automatic or self-referent information processing. The researchers posited that the default-mode network helped with complex task by increasing connectivity with regions supporting cognitive control (p. 227), the fronto-parietal network was activated during demanding tasks important to control of cognition, and the limbic system was the brain network that tended emotions and produced feelings, interpreted sensory impulses, and facilitated

memory storage and retrieval. As subjects reported mind wandering during an assigned task, magnetic resonating imagery scanning measured cortical thickness to capture activity in regions of interest in brain activity to identify differences in reports of intentionality. Respondents reporting more deliberate mind wandering while completing mind wandering questionnaires, titled the MW-D (deliberate/intentional) and MW-S (spontaneous/unintentional) questionnaires respectively, evidenced a pattern of greater integration between the default-mode network and regions of the fronto-parietal network (p. 233).

Spontaneous mind wandering offered different results. Golchert et al. (2017) found that those reporting higher rates of spontaneous mind wandering while on task showed cortical thinning in regions of the right parietal cortex. This thinning could have made integration harder between the default-mode network and fronto-parietal network. Golchert et al. reported that higher deliberate mind wandering was associated with clusters in both DMN and fronto-parietal network. They suggested the process of deliberate/intentional mind wandering depended, at least in part, on the integration of executive control and default mode networks. This brain activity research supported differentiating intentionality. These findings confirmed that intentional and unintentional mind wandering related to cortical thickness that was observable and different.

McCormick et al. (2018) investigated the role of the hippocampus in mind wandering. The authors said it was established that mind wandering has influence across cognition on processes such as future, planning, creative thinking, and problem-solving (p. 2746). In their research, they wanted to know the ways the hippocampus, which is part of the default mode network, functioned and to what degree it played a causal role in mind wandering. To investigate, their research involved a sample of six subjects with a mean age of 57.0 years, with selective memory impairment due to diagnosed hippocampus damage. All displayed impaired in

immediate and delayed recall on a short stories test. They also had a control group of 12

participants with same median age, making sure to pair each of the patients with two of the

control subjects. Their findings were that subjects with this diagnosed damage reported mind

wandering only in the present as contrasted to those without such damage mind wandering across

past, present, and future.

Research by Golchert et al. (2017) and McCormick et al. (2018) brought all the thinking

about thinking back to operations of the physical brain. The authors demonstrated that mental

processes are observable and measurable. The study by Golchert et al. regarding network

processes preceded my participant self-report episode findings that mind wandering has

significant frequency and descriptive differences according to its intentionality. The inquiry by

McCormick et al. (2018) about specific brain damage affecting mind wandering, highlighted in

this study as temporality, confirmed the cooperation of different aspects of the physical brain for

deliberate versus spontaneous mind wandering (p. 231).

Meta-Awareness and Intentionality

Zedelius and Schooler's (2018) chapter in *The Oxford Handbook of Spontaneous*

Thought: Mind-Wandering, Creativity, and Dreaming (pp. 233–248) brought together

considerable research and different types of mind wandering that affect cognition and behavior.

This chapter was something of a considerations checklist for me as I designed my study. The

authors broke open the view that mind wandering during a task interfered with task performance;

they drew readers to the role of meta-awareness and asked us to consider the more subtle

differences that big assertions of this or that can obscure. Zedelius and Schooler posited that

researchers found mind wandering thoughts were more often about everyday things, more often

pleasant than negative, and future oriented more than past or present. I particularly asked about

these in my research questions for working adults reporting mind wandering episodes in daily

life. Further, Zedelius and Schooler (2018) said the distinctions between intentional and

unintentional mind wandering "may go hand in hand with different thought content" (p. 5). They

reasoned that intentional mind wandering episodes were more conformed to the individual's

context, and within my study, context demands. Their reasoning was that "intention" suggested

awareness. Zedelius and Schooler posed that deliberate mind wandering, identified as intentional

mind wandering in my research, might be similar to what Singer and his colleagues called

positive-constructive daydreaming. The authors said further investigation could view ways

different forms of mind-wandering foster different types of thought content (p. 6). I made this a

goal for my research, to explore mind wandering intentionality for working adults in daily life.

I include in this section the research by Seli et al. (2018) who asked if people could

modulate their mind wandering in anticipation of future increases in challenges presented by

their tasks. In a study with sixty subjects with a mean age of 28.83, among several study design

aspects, the researchers set up a clock task with bonus compensation for correct responses,

sampling mind wandering by using thought probes at intervals. The authors stated that their data

showed people could adjust their mind wandering, intentional and unintentional rates, in the

moment, according to their anticipation of near-term challenges within their task. That is, they

could mind wander or not mind wander. Their findings suggested that definitions that considered

mind wandering as only related to thinking with insufficient executive control needed a wider

net. Though their data was collected with a small sample in a controlled setting with a contrived

task, the authors posited that "people's propensity to mind wander had no measurable influence

on performance" (p. 6).

I pause here. The terms "intention" and "mind wandering" have been part of the language of the study of spontaneous thought, true. However, as Minsky (1986/2014) asked, "why do we 'thing-ify' our thoughts" (p. 231)? Doing so does allow us to investigate, but it also runs afoul when our word choice is nuanced, as is the case with intention. The word suggests agency, want, willfulness, purpose. Pretty soon, it sounds like a word that would have little to do with something as transitory and frequent as mind wandering. Yet intentional mind wandering, being open to think of something other than what one is doing, was easily understood by the working adults in my study as they reported thousands of intentional mind wandering episodes. Further, their occasional written comments indicated to me that they understood the difference between "open to" mind wandering and "popped up" mind wandering. Perhaps lay language, i.e., open to, popped up, just happened, had time, are situated into a laundry room, kitchen sink, and other contexts.

Mind Wandering Episode Descriptive Variables

I designed my study so that when participants were notified to report if they were or were not mind wandering, they responded to two mind wandering episode frequency items and six descriptive variable items. I did not just pull these out of a hat. As a writer and poet, I know that ordering the elements of story creates coherence and memory. These descriptive items were thought type, thought content, temporality, context, context demand, and emotion. Those who responded that they were not mind wandering still answered as to context, context demand, and emotion when notified. The research and literature presented in this section informed my selection of variables and my understanding of their relationships.

Characterizing Variables: Thought Type, Thought Content, and Temporality

When notified, participants reported if they were mind wandering and if so, was the episode intentional or unintentional. I then asked respondents to report their thought type, thought content, and temporality. These three variables were selected to characterize the episode. While each of these variables seem so ordinary as to be a cup of coffee, an "of course" element of a thought, putting these three together necessitated that I first take them apart. I will save temporality for later and begin with thought type. I wanted to know something about the function of participants' mind wandering episodes and offered these choices: *day-to-day things I need to do*, *creative or interesting experiences*, *things I'm trying to figure out or plan*, *concerns or worries*, and *other things not listed*. Thought type was central to my inquiry as scholars have investigated and discussed whether mind wandering was constructive, that is, characterized as useful. Irving (2016) posited that although mind wandering appeared purposeless in that it was unguided, research studies have reported mind wandering to be purposeful because it was frequently motivated by personal goals (p. 549).

I considered Irving's writing on personal goals as it might shed light on my study's participants' episode reports on thought type and thought content responses. For example, when thought content was reported to be about *my children*, this gave evidence that the personal goal at that moment was motivated by kin care (Ko et al., 2020, p. 174). When thought content was combined with thought type, e.g., "I was intentionally mind wandering day-to-day things I need to do about my children," the usefulness of the mind wandering as to personal goals became more apparent. Thought type operationalizes thought content. One could not be understood without the other. For data analyses in Chapter IV, I combined mind wandering thoughts about day-to-day things I need to do and things I need to plan into practical thoughts.

Researchers have posited that an important aspect of mind wandering was that the mind moved to and fro (Seli et al., 2018, p. 482), as the term wander meant to travel aimlessly. While the "travel aimlessly" could be honored to a fault within the understanding of mind wandering, I looked further at paradoxical usefulness of this movement. Mind wandering has been defended, in its intentional occurrences, as a positive and productive thought process, harkening back to Singer's late mid-20th century suggestion of positive constructive daydreaming (1975). Agnoli et al. (2018) asserted, in a study with 77 undergraduate students, each completing a series of questionnaires and a creative divergent task, that mind wandering could function as a positive or negative personal experience and wrote that mind wandering could help to keep individuals on track to achieve self-relevant goals and current life concerns (p. 42).

Interestingly, only ten years before, McVay et al. (2009) argued that task performance was hampered when subjects reported off-task thoughts (p. 861). McVay et al. involved 72 undergraduate students in a seven-day experience sampling study using iESP software on a Palm Pilot PDA. The students responded at random times up to eight times daily with a mean response of 45.6 useable questionnaires. Responses as to mind wandering had considerable variety with a range of 6% to 75%. I describe this portion of the study by McVay et al. because the data from a naturalistic setting experience sampling was a less common research design effort in the studies I have read, and, re-reading this research again after running my study, I identify with the complexities of collecting this data, particularly before iPhones. While McVay et al. sought to compare participant's lab setting mind wandering with their reporting in daily life, what captivated me in this research was giving participants episode opportunities to report on content and thought types as well as the self-report of how mind wandering did or did not interfere with task. While these were not working adults, participant-level mind wandering rates in the lab and

daily life were consistent, that is, there was considerable variability in participant-level data showing comparable mind wandering frequencies in both settings.

Agnoli et al. (2018) considered mind wandering as an intentional mental tool used to think here and there about life concerns. McVay et al. (2009) deemed mind wandering to be a symptom of an inability to concentrate. The notable difference in the findings, in my view, was that McVay et al. did not distinguish between intentional and unintentional mind wandering. Without this distinction, the earlier findings were muddied. As well, I noted that the researchers had a 60-minute training session prior to the naturalistic setting experience sampling. Subjects were instructed to take immediate note of their thoughts at the beep. I wondered if this sensitized the subjects to be hyperaware of the relationship between task and mind wandering such that they were on the alert for mind wandering as another name for being unproductive.

The hypothesis and theory article of Smallwood and Andrews-Hanna (2013) concerned the importance of a balanced perspective in the investigation of the constructive properties of mind wandering. The authors stated that the waking mind was often "occupied with mental contents that are minimally constrained by events in the here and now" (p. 1) and said even reading their article could, to paraphrase, blur. They emphasized that, "Despite our sense that self-generated thought can be an irritant, this interpretation is unnecessarily simplistic" (p. 1). Smallwood and Andrews-Hanna referenced Henry Louis Mencken, a 20th-century scholar and journalist, who wrote about complex problems having simple easy to understand wrong answers as they said, "phenomena as intricate as self-generated thought require explanations that are sufficiently complex" (p. 4).

Research on thought content included the work of Andrews-Hanna et al. (2013) who posited that "the content of people's inner thoughts can be 1) productively examined, 2) distilled

into several major dimensions, and 3) account for a large portion of variability in their functional outcomes" (p. 900). Recognizing the considerable time people spent in self-generated thinking, with benefits and costs, Andrews-Hanna et al. investigated phenomenological content. They sought to understand the hypotheses that content was an important factor that informed costs and benefits. The multi-part research included having the analyses of data produced by seventy-six young adults, one third of whom were determined to mildly to moderately depressed using the Beck Depression Inventory. The task given to participants was to recall 36 different thoughts that had been on their mind and generate a three-word description for these thoughts, and rate the thought for different content variables, i.e., self-relevance, emotionality intensity, and others. Andrews-Hanna et al. concluded that self-generated thoughts, mind wandered thoughts, can be well-characterized as to their personal significance, outlook, and level of construal, a complex characterization best not diminished in a sentence here. While depression can interfere with cognitive focus (Cartreine, 2016), Study findings by Andrews-Hanna et al., read in conjunction with Smallwood and Andrews-Hanna's theory article (2013, pp. 1–6), showed that when content was positive, less personally significant, and more specific, the individual scored higher on a sense of well-being. My study did not ask if the content was positive or personally significant. It did ask for emotion and perhaps this has relevance to positive content, e.g., mind wandering intentionally about my children and feeling good.

Thought content related to emotion has been studied. The broad assertion of Killingsworth and Gilbert's study (2010), which I describe in the next section, that mind wandering was associated with negative mood established a provocative association between mind wandering and negative emotional state that necessitated further research. Franklin et al. (2013) found mind wandering was sometimes associated with positive mood. Using a personal

digital assistant for thought probing, their data conformed to the Killingsworth and Gilbert study, but additional analyses showed that mind wandering high in interesting content resulted in positive mood (p. 3). Franklin et al. (2013), combined with Killingsworth and Gilbert's results, posited that while mind wandering content could influence mood, mood must be understood in the context of the episode itself. Episodes considered to be of high interest and/or high usefulness to the individual could produce positive mood; those considered of low interest and low usefulness could have the opposite impact.

There is a dilemma in asking the "stop and think" experience sampling questions, in my view. That is, asking questions that require evaluating or reflecting to "come up with an answer" might take the respondent out of the mind wandering episode. Thus, how to ask an individual to assess the interest level of their episode, when to ask this in a series of quick questions, is an art. In my study, with 30–40 seconds of participant response time, I sought thought content related to work, children, family, friends, and self in accordance with Klinger's (1971) claim that we think about what matters to us personally.

Contextualizing Variables: Context and Demand

Mind wandering thought in this study needed to be understood in context. Smallwood and Andrews-Hanna (2013) offered two hypotheses that "(1) highlight task context and thought content critical factors constraining the costs and benefits of self-generated thought, and (2) provide direction on ways to investigate the costs and benefits from an impartial perspective" (p. 2). *The content regulation hypothesis* was proposed to say that the capacity to regulate the content of self-generated thought to maximize the productivity of the experience indicated that a cognitive system was functioning in adaptive ways. The researchers said that such thought, when

focused on the future, allowed planning; such thought focused on the past indicated distress and unhappiness.

It has been my position that the past and the future were not dark and light sides of the moon. They inform each other. With regards to working parents, for example, when an individual had a multi-generational life, say with living parents or siblings and children, the past, present, and future overlap. This has been true in a two-generational household as child and parent brought forward the parent's life lessons learned, not as history to prompt brooding, but as a resource for action in the present. Parents have been heard to say, "well, when I was a child …" and bring up a memory. Even when a memory was provided as negative, it could constructively inform the present, "well, I will do better by my kid."

Smallwood and Andrew-Hanna's second hypothesis, *The context regulation hypothesis*, posited that self-generated thought, or mind wandering, was most prevalent in nondemanding contexts, that costs and benefits of self-generated thought were context dependent, and that there were experimental considerations needing a range of different contexts. But what was routine and nondemanding? In determining what I asked study participants, I considered my lived experience of marathon caregiving for a toddler home with congested lungs complicated by hand foot and mouth virus. Caring for children could appear to be a basket full of nondemanding tasks, i.e., bathing, preparing food, and changing diapers. Ha! These are anything but nondemanding! Such task contexts can flip in an instant to high demand. This leads to the issue of context demand. Demand may not be cognitive; it may be the physicality, emotionality, or urgency. Thus, Smallwood and Andrews-Hanna's self-generated thought hypothesis acknowledged "the complexity of the given task environment is always relative" (p. 3).

Smallwood and Andrews-Hanna (2013) made a statement that informed my inquiry. When investigating psychological phenomena, they said that the researcher must choose a context into which to embed her research (p. 2). The authors spoke to the trend of mind wandering research to use an experimental context with complex tasks requiring continuous demand of attention with university-aged subjects. Mind wandering during such complex thought conditions was observed to lead to error on many levels—poor comprehension, poor encoding of material into long-term memory, and absent-minded forgetting. Smallwood and Andrews-Hanna posed that mind wandering in the context of complex task was decreased and did not speak to daily life. "Simple tasks are also closer to the environment in which we are likely to experience most self-generated thoughts in daily life" (p. 2).

Kane et al. (2017) presented their study findings and cautions that mind wandering theories based completely on laboratory studies did not offer a complete understanding of the phenomenon. They stated that "because mind wandering's costs and benefits vary by context, so will its regulation; researchers should therefore examine mind wandering across a range of laboratory contexts (p. 1272). Their study went further and contrasted lab findings with daily life data (p. 1273).

My observation was that lab-based research controlled for the task and location of that task, thereby, the participant's context during an experience sampling. This created a sustained contrived task level in a non-interrupted context. The opposite was true in my daily life experience sampling study across the United States. Participants were engaged in all sorts of complex and simple tasks that were naturally interspersed during their days. As well, complexity was not in the eye of the beholder. It was generated within the lived experience of the respondent and reported by the respondent. In my investigation of respondents' perceived utility of mind

wandering, I asked questions during workday and personal/family times. The numbers of experience samplings in varying circumstances gave the study a robust range of contexts and opportunities for out of domain thinking. Lastly, this study did not judge unintended mind wandering as "a lesser good." I learned about both "open to' and "just happened" thoughts.

Emotions and Temporality

Mood before, during, and after mind wandering has been the focus of various studies. In my study, I asked participants, when notified, to report how they were mostly feeling. I did not want to suggest causality, that is, feeling not so good causes mind wandering, but, rather, a participant's perception of her or his state of well-being, feeling great, good, or not so good at the time of the notification. It was important to take emotion apart to understand the studies, findings, and conclusions that most apply to my reasons to ask this question.

Killingsworth and Gilbert (2010) conducted a study that has been required reading for all who investigate mind wandering and mood. The authors claimed that people's minds wander frequently, regardless of what they were doing. The authors used self-reports via an iPhone app, *www.trackyourhappiness.org*. Killingsworth and Gilbert (2010) described their findings in *Science* and said 2,250 participants were asked lifestyle questions via experience sampling across a week. The authors' conclusion was that people were more unhappy when they mind wandered than when their thinking was focused on their tasks. This conclusion was widely circulated to assert that mind wandering caused unhappiness. This conclusion presented other researchers with a certain "chicken and egg" conundrum, does mind wandering cause unhappiness or does unhappiness cause mind wandering?

Three aspects of this study were relevant for my research: the criteria for selecting the sample, types of mind wandering, and pre-existing biases concerning the topic. Regarding the

selected sample, the subjects using the happiness app had personal motivations to use an app about happiness. It was unclear if the sample was biased to include individuals experiencing sadness or anxiety, hoping an app could help them. While diverse in age, location, and occupation, it was not known what motivated subjects to select this app. Secondly, Killingsworth and Gilbert's study, as reported, lacked detail about the types of mind wandering subjects were reporting. Other researchers have emphasized the importance of definitions (Seli et al., 2018; Seli et al., 2017) and separating intentional from unintentional mind wandering. Thirdly, researchers could not ascertain participants' "down on mind wandering" biases, perhaps considering mind wandering a wasteful behavior. The message that being off task was not a good thing has been woven in the American educational system and workplaces. McMillan et al. (2013) cited decades of considerable research that portrayed mind wandering as a cognitive control failure, with ill effects on reading comprehension, academic performance, attention and other aspects of productivity at school and at work. Killingsworth and Gilbert did not indicate whether they asked subjects if they had biases about mind wandering being a negative behavior.

A certain "sound bite" phenomenon occurred with the release of Killingsworth and Gilbert's research. The claim that a wandering mind was an unhappy mind escaped its academic context. Michael Pollan, in his best seller *How to Change Your Mind* (2018), extracted this study's finding for other purposes. In his *TED Talk* on mindfulness, Headspace CEO Andy Puddicombe (2013) quoted the study, although not crediting its authors, when he asserted that people are "lost" when they mind wander, that nearly 50% of the waking time was spent using the mind to do something negative. Such a claim contributed to a certain "don't do it, it's bad" that people were hearing as adults and remembered as childhood scolding about mind wandering. Lastly, the framing of Killingsworth and Gilbert's study, "a wandering mind was an unhappy

mind," suggested to readers and listeners that is was the mind, not the person who mind wandered, thus implying that the mind has agency. Rather, it is the individual who thinks.

I note that Choi et al. (2017) looked closely at momentary experiences of happiness and meaning. Using experience sampling, they said that levels of happiness and meaning fluctuate considerably during the day. Further, they stated that contextual factors, i.e., who a person was with, type of activity, time of day, predicted moment of happiness and meaning. The study engaged over 600 university students from around Korea. The research supported the conclusion that the relationship between happiness and meaning in the moment was not static (p. 647). This study informed the design of my own study, and the importance of daily life research that samples across the activities that are common to all of us, work, time with family and friends, time with ourselves, chores, fun, and ordinary. Only when we are sampled in a variety of activities, some producing happiness, some grumpiness, some oh-well-ness, can we get a reading on our days as mind wanderers.

Poerio et al. (2013) investigated the relationship between negative mood and mind wandering and claimed, "our results contradict Killingsworth and Gilbert's (2010) contention that unhappiness is the consequence of mind wandering" (p. 1419). They presented the logic that if mind wandering caused negative mood, then not mind wandering caused improved mood. However, since mind wandering reportedly occurred with a frequency between a third to half of waking life (Killingsworth & Gilbert, 2010), it was impossible to extract mind wandering out of a mind. Therefore, the researchers reasoned, it was important to investigate the causal relationship between mind wandering and negative mood.

Poerio et al. (2013) recognized that precedent and consequent negative moods were not mutually exclusive; there could be many explanations, including depressive symptomology (p.

1413). Their experience sampling study included 24 subjects and asked about mind wandering and mood. Measures included affect content, time orientation, and current concerns. Using timed intervals to collect subjects' affective state at time of and fifteen minutes after mind wandering, researchers measured sadness and anxiety as precursors and consequences of mind wandering in daily life. They found that reporting sadness prior to mind wandering significantly predicted subjects' mind wandering with sad content; the same was true of subjects reporting anxiety prior to mind wandering. The authors were thus able to tease out prior and resulting mood. Their findings suggested that mind wandering was not inherently detrimental to people's sense of well-being. Figure 2.5 illustrates what mind wandering might feel like when the subject is already sad.

Figure 2.5

Sadness Prior to Mind Wandering

Note: *Sadness Prior to Mind Wandering.* Copyright 2022 by Paula C. Lowe.

Poerio et al. (2013) posited that emotions preceding mind wandering affected mind wandering in a congruent way. With regards to time orientation, that is, whether the mind

wandering was focused on the past or future, the study provided evidence that feeling sad before mind wandering predicted a focus on the past. By contrast, anxious feelings, worry or unease about an uncertain outcome, were seen to predispose mind wandering to future thinking (p. 1417). Poerio et al. offered four conclusions that indicated that mind-wandering was not inherently detrimental. First, sadness was a significant precursor of mind wandering; however, mind wandering itself had no mood lowering effect over fifteen minutes. This, they said, was in line with the research position that sadness could lead to or further mind wandering, but that sadness did not follow mind wandering as a result of mind wandering in the absence of precursor sadness.

Secondly, the authors said that previous mood predicted later mood. Feeling sad before mind wandering predicted sadness after mind wandering. The distinction between thought and thought process that Poerio et al. made was in the claim that negative cognitions during mind wandering, not mind wandering itself, may lower mood during mind wandering, a finding consistent with literature that stated self-referent cognitions are influenced by cognitions in a consistent manner. Thirdly, sadness was related to thoughts about the past, but anxiety related, in a certain degree of association, with the future. Fourthly, precedent mood impacted how relevant mind wandering was to a person's current life concerns and mood impacted how relevant mind wandering was to the subject's current life concerns because prior anxiety and prior sadness predicted mind wandering to highly relevant concerns.

Poerio et al. (2013) said it was possible that negative mood acted as a trigger for personal problems or goals that were then dealt with during mind wandering. In sum, this study found that mind wandering was not causal nor inherently negative for individuals' happiness. For my research, I included a question about emotion, "when responding to this notification, I was

feeling mostly …" at the time of mind wandering episode. Choices were simple, *great* to *not so good*. Perhaps asking a respondent to evaluate mood, a sustained emotional state, is more complex in an experience sampling and could trigger reflective thinking that moves the respondent further from the moment of mind wandering.

Self-reference has been said to affect feeling and connection. In their investigation as to whether increases in happiness, love, and connection during social daydreams were caused by the emotional content of daydreams, Poerio et al. (2015, p. 137) conducted a study with 101 subjects of whom 20 were employed and 81 were students (81 women, 20 men, mean age 22.32 years, *SD* = 5.17). The methodology was that participants were notified four times via text messages to answer online surveys, making the distance between the experience of daydreaming and the report of it a bit cluttered. As well, they were sampled four times on one day only and this was a nearly 80% female student study. All of that taken into account, what drew me to this research was the finding that social daydreams associated with increased feelings of happiness, love, and connection happened only when the participant's daydreams concerned individuals with whom they had a high-quality relationship. The significance of these findings for my research was my thought content question which gave the choices of my children and other family and friends.

Summary

This chapter began with hats off to the thought leaders who planted the seeds for us to grow a field of mind wandering research. These leaders urged us to conceive that thinking is not all about getting things done. Our ability to think beyond ourselves in brief moments is a large part, a 30%–50% of our waking hours part, of our thinking. Mind wandering is often about things that that matter to us personally, whether that be our families, friends, work, ourselves,

and more. Research has established that regions of our brain communicate with each other during mind wandering. As philosophers and researchers have considered mind wandering over the past one hundred years, we are the lucky ones to live in a technology time when mind wandering can be readily studied in naturalistic settings.

You have just read selected mind wandering, intentionality, and descriptive variables research and theory papers that informed the ways in which mind wandering intentionality, thought type, content, temporality, context, demands, and emotion have been measured and understood in the company of each other. Rather than merely citing this or that paper, I presented key studies with more depth so that you could not only appreciate the findings, but also consider the methods, particularly experience sampling, required to do "thinking research."

My Chapter II take aways were these. It matters to have a clear definition of mind wandering and for that definition to be clear and simple for participants to use in the moment of sampling. This was the best way to assure that the results of this mind wandering study were not mis-aggregated such that assumptions about frequency and negativity were reported inaccurately (Copeland, 2017). For my research, my definition was time-framed, "In the last few minutes, I was mind wandering about things not about what I was doing. Yes or no?" Second, intentionality matters. Not pulling apart mind wandering intentionally, "open to" mind wandering, and mind wandering unintentionally, "popped up," fails to recognize these two types of mind wandering as distinct and associated with different descriptive variables. Third, characterizing variables, thought type, thought content, and temporality, describe the basic elements of a mind wandering episode. These inform each other. If you string descriptive variables together, you have the cast and plot of a mind wandering episode, e.g., "Christine intentionally mind wandered about day-to-day things she needed to do at work today." Fourth, contextualizing variables, context, context

demand, and emotion capture the episode 's circumstance and gut check. Put these variables together and one has a quick narrative of a mind wandering episode.

Once again, mind wandering does not happen to us. We mind wander. This chapter introduced the "us" of this study, adults ages 25–50 working and living in the United States, parents and nonparents, who submitted thousands of experience sampling surveys. Researchers have asserted that mind wandering rates fluctuate across the day (Smith et al., 2018) making sampling for an hour in a lab insufficient to account for this fluctuation. This study was designed to capture evidence of that fluctuation in daily life.

CHAPTER III: METHODOLOGY

> A seed knows how to wait. Most seeds wait for at least a year before starting to grow.
> A seed is alive while it waits. Every acorn on the ground is just as alive as the
> three-hundred-year-old oak tree that towers over it.
>
> —Hope Jahren, *Lab Girl*

Nearly 100 years ago, American philosopher John Dewey said that inquiry into all aspects of life should proceed from experience, and research choices should come out of what makes us curious (Wergin, 2018). Curiosity for me has been akin to a seed that knows how to wait. I have long been curious about mind wandering in daily life. To conduct this study, I not only took on the considerable learning about this field, I also walked around with my thoughts about how best design my exploratory study. My purpose was to explore a new area of study concerning working adults in daily life, particularly parents and nonparents, to add knowledge to the fields of leadership and change and mind wandering research. I could not measure every tree in the forest, but I conducted foundational research.

This chapter is organized in the seven steps I undertook to explore the mind wandering of working adults. Each of these steps was based on the research questions provided in Table 3.1.

Table 3.1

Study Questions Operationalized Into Research Questions

Study questions	Research questions
What do we know about the working adults who joined this study?	RQ1: Who were the participants in this study? What are the descriptive statistics for this working adult sample from the United States?
Is mind wandering a frequent part of working adults' daily life thinking?	RQ2: What were the rates of overall, intentional and unintentional mind wandering for all participants, by parent status, and gender?
What are the characteristics of working adult mind wandering episodes?	RQ3: What were the statistics for all, intentional, and unintentional mind wandering episodes as to thought type, thought content, temporality, context, context demand, and emotion for all participants, by parent status, and gender?
What can we learn about working adult mind wandering by linking episode descriptive variables and by comparing when they do and don't report mind wandering?	RQ4: What can we learn about working adult mind wandering episodes by linking within mind wandering episode characteristics and comparing mind wandering and non-mind wandering episode data?
What did working adults have to say about their mind wandering episodes?	RQ5: In what ways do the experience sampling episode comments, by intentionality and thought type, inform the statistical data?

Step 1 provides my ontological and epistemological positioning for this study. Step 2 presents the rationale for using a quantitative methodology, the fundamentals of the experience sampling method, the selection of Expiwell to conduct experience sampling, and considerations for research in a naturalistic setting. Step 3 provides important considerations for experience

sampling and how I addressed these for my study. Step 4 provides the onboarding and experience sampling surveys and detail about the survey questions. Step 5 describes collecting my data. Step 6 concerns analytical strategies. Step 7 completes this chapter with ethical considerations and study design limitations.

Step 1: Establish My Researcher Position and Practice

Within a research world view, I chose a realist ontological position to conduct this study. My inquiry was based on the considerable research, presented in Chapter II, that established mind wandering as a phenomenon of thinking that was distinct with frequencies and factors that can be queried and counted. Self-report has been the most recognized means by which occurrences of mind wandering have been documented, both in laboratory and naturalistic settings. This study used a scientific method, experience sampling, to collect study participants' self-reports about their mind wandering in day-to-day life.

My epistemological position for this study was positivist. Positivism put forth that we know through "counting external realities through measurement and quantification" (Park et al., 2020). This study demonstrated that mind wandering can be known as a phenomenon experienced by working adults. It held that these individuals reported, when prompted to do so, the occurrence and factors characterizing their personal experiences of mind wandering.

Consistent with the academic mission of the Antioch Graduate School of Leadership and Change to study, research, and practice leading positive change in workplaces and communities, my dissertation's methodology was informed by the scholarship of integration and practice (Wergin, 2018). Wergin said that the scholarship of integration meant asking questions about what findings mean in the larger context in which respondents participated in this study. The context for this study was the shared societal events of the Covid Pandemic. While the pandemic

was two years old at the time of data collection, surges and wanes had necessitated public health related changes to the ways in which adults were able to work, children were able to learn, and families and communities were able to function. At the time of my national data collection in January through April 2022, schools were re-opened, and workplaces were adjusting. Still, Covid variants brought new problems to solve for working adults in the United States—inflation was high, fuel prices were sky-high, and international tensions were high as Russia invaded Ukraine. As much as Americans wanted Covid to be over, we lost the expectation that it would ever be over. Though we took off face masks, we kept these in our kitchen drawers.

The scholarship of practice took integration further by asking how the study's findings would be applied to consequential daily life problems that subjects expressed in their surveys and comments. Wergin's (2018) position was that an important contribution of research may be "to introduce dissonance into existing knowledge perspectives about what is 'true' or 'universal'" (p. 36). I investigated factors established in university lab studies concerning younger adults. I carried those factors, in the basket of the smartphone app survey, to the "real world" of daily life with participants across the United States. These working adults shared their day-to-day, creative, planful, worrisome and other mind wandering, often with comments that painted a picture of their lives. I never saw these participants, yet, and I say this particularly as a poet, they shared moments of their stories in their 1-minute surveys. Wherever they were—waiting in a school parking lot for a child, worrying about their friend with cancer, dealing with bills and work schedules—I was given those moments to understand mind wandering not just as a phenomenon to study, but as a form of lived daily thinking. This chapter shares the steps I took to respect my participants and work together as "maker and taker" to generate this research. Out of this, Wergin's "dissonance into existing knowledge" appeared in the form of new findings.

Step 2: Set Up the Quantitative Method of Experience Sampling

To get inside mind wandering experienced by working adults, I asked, How does one glimpse, repeatedly, the thoughts in the mind of another person, particularly another the researcher never meet? As Smallwood and Schooler said, "conscious experience is fluid; it rarely remains on one topic for an extended period without deviation" (2015, p. 487). To catch a glimpse of thought is akin to setting a snare for a flash of light—"did you see it? It was right over there, that shooting star." My choice of methodology was quantitative because, to achieve the positivistic purpose of this study, I needed "glimpse" data from hundreds of subjects across the United States. I did not intervene as I queried working adults about their mind wandering in daily life. Interviews or focus groups, even surveys after the fact of the experience, would have gathered what the individual remembered about transient thought. A quote I keep on my desk informed my choice to avoid methods involving reflective thinking since, "you cannot think about thinking, without thinking about thinking about something" (Papert, 1980).

To glimpse was to sample what was happening in the now as illustrated in Figure 3.1 (I note that this glimpse does not imply the length, breadth, or width of the subject's thinking.). Collecting experiential evidence of mind wandering meant briefly questioning subjects in naturalistic settings. I needed a quantitative research process that delivered immediacy and simplicity. The challenge was to ask a few questions recurrently, all the while taking care to minimize intrusion, reduce reflective thinking, and avoid tedium. Since adults past their university years do not have labs to go to, and other adults past first jobs never had labs to go to, the best way to conduct a quantitative study in the world in which people live, work, and raise families was experience sampling.

Figure 3.1

In the Present Betwixt Past and Future

Note: *In the Present Betwixt Past and Future*. Copyright 2022 by Paula C. Lowe.

The Experiential Sampling Method

Researchers have used experience sampling, often referenced as Experience Sampling

Method (ESM), in laboratory and naturalistic settings for many years. In this method, questions

are asked of participants at varying times across specified days using some form of prompt that

signals the participant to stop what she or he is doing and report on aspects of what she or he is

experiencing at that moment. One of the first experience sampling studies was conducted by

Klinger and Cox (1987) as they investigated three criteria of daydreaming, variance with reality,

stimulus-independence, and unintentional or undirected occurrence. Without smartphones, for

seven days their 29 student subjects carried a beeper to prompt them to respond to experience

sampling questions on thought sampling questionnaires and activity reports in naturalistic

settings. Yes, these were paper and pencil forms.

Although the idea of repeatedly asking a subject to respond in the moment sounded

simple enough, an experience sampling study has many moving parts. It has been a challenging

research design for seasoned researchers, even those with university resources and grant funding. Without these, I was grateful that Christensen et al. (2003) provided a practical guide for experience sampling research based on what they learned in their studies. First, they cautioned that experiencing sampling could only generate what a participant was willing and able to represent in conscious awareness at the instant of self-report. "Experience-sampling procedures are not a direct 'pipeline' into consciousness; they cannot correct for or prevent the processes that transform conscious experience into information available for report" (p. 55). Threats to the accuracy of self-report include respondent mindsets that may carry personally biased thoughts about mind wandering (Zedelius & Schooler, 2017).

Christensen et al. (2003) raised practical concerns and solutions when conducting an experience sampling study. They pointed out the need to reward subjects for participating in a study that is interruptive across many days. The authors were firm about the importance of compensating participants to offset the burden of sampling. They said this may reduce attrition and lack of compliance. They urged researchers to offer modest financial incentives, e.g., a small payment for completion and time spent, and noted the need for IRB approval for this completion rate payment. In addition to an extrinsic reward, the authors said that researchers should make intrinsic rewards clear, e.g., participants donating time to science for a worthy cause. I did this in upbeat ads and inviting website, repeatedly thanking my participants for contributing to this research on this topic. Christensen et al. said these should be put forth at the beginning of the study and referenced throughout the sampling period (p. 57). In my study, with IRB approval, qualifying participants were paid $10. Using a study website, I offered study information, directions, cheering, and participant experiences. Although they were answering notifications

within their own lives, I wanted participants to feel they part of a national study that was important to the field of thinking research.

Christensen et al. advised on such issues as the length of the sampling period, amount of time to respond, and identifying the time of day during which the target behavior was likely to occur while avoiding times in which conflicts could occur, i.e., dinner time or driving. These design choices, they said, should be based on the amount of data per person that produced a stable estimate of their responses, consideration for participant burden, and expected compliance (p. 61). They noted that response rates, at the time of this paper's publication, seemed lowest, roughly 70%, for studies on a computerized device signaling multiple times a day. They advised against sampling over six times a day for multiple-day studies (p. 62).

Several technology changes helped me conduct my experience sampling study. Since the publication of guidelines by Christensen et al. (2003), this research method has become user-friendly with participants receiving notifications via a smartphone app. In my mind wandering study, this allowed participants to go about their lives, with their phones accessibly nearby, and respond to notifications wherever they were. Vendors such as LifeData, ilumivu, Expiwell, and others provide a customized study app that securely records the responses of the individual and provides necessary data-related services that conform to IRB guidelines.

The Experience Sampling App

I selected Expiwell for my experience sampling data collection. I made this choice after my IRB-approved intent to get my data through a participant recruitment company fell away. As I began to set up my study, I found that the participant recruitment company I had chosen was not set up to work with a doctoral experience sampling study such as mine, that wanting and

getting a certain sized sample meant paying the company a hefty fee and the participant

considerably more than for a static survey. There were also legal issues as I was not a company.

After many delays and rabbit holes, I secured a one-year use license with Expiwell. The

company's philosophy is to foster relationship building between researchers and participants.

The company offered app license discounts for doctoral researchers. The technical development

of the Expiwell researcher website was exceptionally user-friendly. It offered real-time

participant log data, the means to edit my study calendar and surveys, participant payments

anonymously through the participant log, the ability to activate/deactivate my study, a display of

data on bar charts updated in real time with participant samplings, CSV data downloads, and

cloud storage for my study data at Expiwell. The company's app and website developer solved

problems every step of the way.

The advantage of using the Expiwell smartphone app was that installing and opening this

app from the google or apple play store was a familiar process for the smartphone user; app

notifications were comparable to those for texts or email messages. Having the app on a

participant's smartphone reduced interruption, anticipation, irritation, and other unintended

consequences of frequent sampling. Due to phone portability—in a pocket, purse, on a desk or

kitchen counter—respondents participated in research outside of the lab setting. During the

study, when a participant was unable to respond, i.e., he or she was driving, in a meeting, or

putting a child to bed, he or she let the notification go unanswered.

In my study, each participant installed the experience sampling app on his or her

smartphone by going to the Apple or Android app store. Next, as shown in Figure 3.2, the

participant allowed notifications in their smartphone settings and adjusted certain settings that

silence notifications, i.e., airplane mode or focus mode.

Figure 3.2

Smartphone Settings for App Notifications
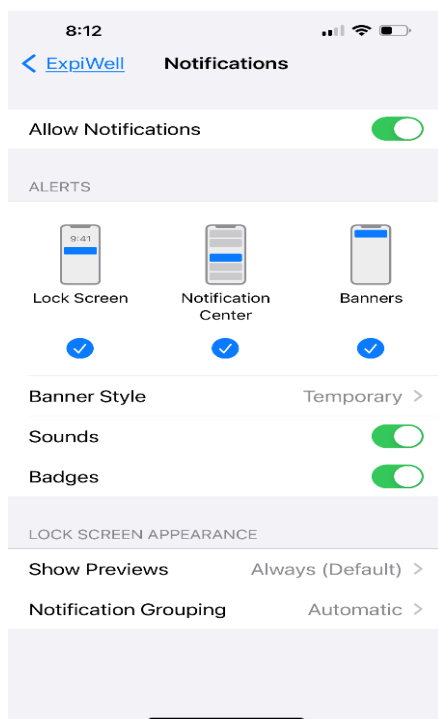
After opening the app, participants typed in the study code, mind22, and email address to log into the study. This login generated a participant number and an ID code related to any data they generated. Participants saw a calendar and chose a start date. On the start date, they could onboard the study at any time between 3 am and 1130 pm. During onboarding, they read study directions, gave informed consent, and answered ten profile questions. When they went to calendar mode, they saw the six timeframes per day in which randomly timed notifications could occur as shown in Figure 3.3. The app showed participants the timeframes in which notifications were scheduled, completed, or missed. This allowed them to keep track of their completes so they would know when they reached 20 completes for payment. Beginning on Day 2, participants received notifications on their phones to respond to the 1-minute experience sampling survey. They continued in the study for up to five days or 30 notifications. In my study,

with IRB approval, participants who had GPS locations in the United States, completed

onboarding with informed consent, and submitted a minimum of 20 out of 30 1-minute surveys

were paid $10 in the form of an Amazon gift card they redeemed on the Expiwell app.

Figure 3.3

App Experience Sampling Calendar With Notification Timeframes
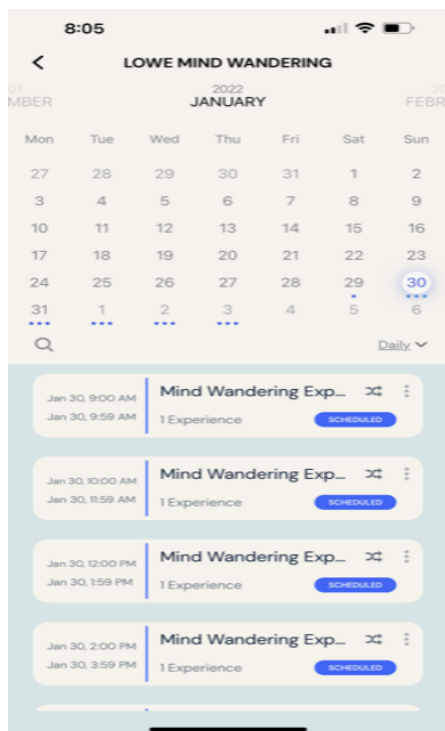
Note: Expiwell Experience Sampling iPhone App Screen. Shared by permission (see Appendix L: Permissions and Copyrights)

Step 3: Address Issues for Effective Experience Sampling

To conduct my study, I investigated and addressed issues relevant to experience sampling

participants who most likely had not participated in experience sampling research before, did not

know much about mind wandering, and were in widely ranging daily life circumstances. The

issues addressed here were as follows:

- the effects of sampling on participants' performance of tasks

- framing, satisficing, and socially desirable responding

- probe-caught versus self-caught self-report

- effects of meta-awareness

- complexities of daily life situations

- probe rate, response options, and framing

Effects of Sampling on Participants' Performance of Tasks

Before asking participants to agree to respond to notification interruptions, I recognized that brief prompts might interfere with what participants were doing when notified. I was concerned that participants would experience a forced choice in which they could not interrupt their task and thereby skipped responding. Researchers investigated how the introduction of thought probes affected the performance of tasks (Wiemers & Redick, 2019). Mind wandering studies have used random interval experience measuring in laboratory-based research. These have embedded self-report thought probes to determine mind wandering during an ongoing task. Wiemers and Redick's study looked at whether the thought probe itself was intrusive on performance. Since thought probes called for the participant to give attention to their relationship with the task they were doing, the researchers investigated if thought probing, as a sampling method, interfered with doing a task in which mind wandering was to be assessed. They found, within the laboratory setting, there were no changes attributable to probing (p. 372).

It is one thing to be interrupted in a lab during a contrived task and directed on a computer screen to report on mind wandering. The interrupted task was not part of a workload at a job one wanted to keep or a dinner one was preparing for visiting grandparents. In daily life, the issue for me as a researcher was not just about respecting the participant's productivity but

also giving that individual transition time to respond. People need a bit of space in which to stop

and start. If you were at a kitchen sink and your phone notified you to complete an experience

survey, you needed to put down what you were cleaning, dry your hands, tell the kids to leave

the dog alone, and give yourself a minute to respond. To respect transition time from task to

self-report, I chose a fifteen-minute window for responding to a notification as seen in the

Calendar in Figure 3.3. Most participants responded quickly, as documented on the Expiwell log

providing participant response times, but giving participants transition time reduced unwanted

effects on performance tasks and unwanted anxieties about "hurry, hurry, respond or it will be

too late!"

Framing, Satisficing, and Socially Desirable Responding

Researchers (Weinstein et al., 2018) conducted a study to consider probe framing on

mind wandering reports. The authors were concerned, given the explosion of published research

articles using the term mind wandering, that researchers' methodology lacked consensus as to

framing. Their investigation on probe-caught method and the report of thought-state looked to

see if framing affected reports. Using an undergraduate sample and 20-minute task, results

showed a significant difference between a mind wandering framing ("were you mind

wandering...") and on-task framing ("were you on task..."). While repeated framing could have

biased the respondent to think that he or she should be either on task or mind wandering, the

researchers concluded that although the self-report data varied between the conditions, this

reason had not predicted actual rates of mind wandering.

Weinstein et al. (2018) explained that satisficing, the tendency to avoid cognitive effort

on a survey question in favor of selecting the optimal answer, was occurring. That is, they

posited that participants chose the answer with the least effort (p. 759). The researchers said the

best solution with regards to the framing of a probe was to use the words that matched the construct of interest, "if you are interested in measuring self-reported mind wandering, then ask participants whether they are mind wandering; and if you are interested in self-reported task attentiveness, then ask participants if they are on task" (p. 759). Thus, if one was measuring self-reported mind wandering, the probe should ask if a participant was mind wandering, avoiding such terms as "off-task" or "spontaneous thought" and other such alternative wording.

I framed my study using the term mind wandering consistently with both frequency and factor questions. I ordered the survey items so that satisficing was not as luring an option. The response sequence flowed. Because the study focused on certain aspects of mind wandering, e.g., working and parenting, there were limited choices for answering a question. For example, when asked a context question, choosing "my work" over and over could appear as satisficing. But really, an individual was likely to be at work as five out of the six daily notifications occurred between 9 a.m. and 6 p.m.

In my view, using the term mind wandering in my questions had a benefit beyond accurate framing. It guarded against participants assuming that task and mind wandering were on a continuum (p. 759) being on opposite ends of thought-states, that is, I think in a focused way when I think about my task, I think in unfocused ways when I mind wander. Thoughts related to doing a task and thoughts about something else when mind wandering are different types of thinking. This was conveyed in the directions and definitions given to participants.

The issue raised by Weinstein et al. (2018) regarding satisficing, the tendency to avoid cognitive effort on a survey question, was important but not unavoidable in my study. If a subject chose a response he or she judged "good enough" (p. 758), I could not control the context in which the subject was engaged when answering. If the activity the participant was doing at the

time of the notification, whether compelling work or exciting mind wandering, was highly engaging, the respondent may have used satisficing no matter my attempts to reduce this possibility. As Chapter IV explains in more detail, participant data that showed very low response time and patterned responses were removed during data cleaning.

Weinstein et al. (2018) added another point that "even when tasks are similar, subtle difference in the probe and response option wordings could be affecting self-reported mind-wandering rates" (p. 759). For my purposes, the respondent could have subjectively viewed "what I was doing," e.g., drinking a cup of coffee, being lazy on a couch, watching a sunset, as not significant enough to be doing something one would be "having thoughts not about." I did not use the word "task" but rather, "thinking about something other than what I was doing."

Weinstein et al. (2018) concluded that the possibility of response bias increased as number of response options increases (p. 759). This was due to questions and responses offering complexities that made the respondent stop to "split hairs." They said that response choices should not encourage respondents to have difficulty in making judgments. I observed that the increased interpretation of and selection between choices could shift the focus from what a respondent was mind wandering about to a new experience sampling process of reflective thinking. I stayed away from this. While a researcher may have many nuanced interests in the respondents' data, the most important aspect of the experience sampling was to bolster the reliability of the data between subjects by not introducing choices that could be interpreted differently by various respondents.

In sum, the issues of satisficing and socially desirable responding are issues for inquiry generating self-report data. Researchers conducting thought probe data collection must take into consideration not only that respondents, when interrupted and asked questions quickly, can

default to satisfying, but that they can answer in socially desirable ways. The research conducted on rushing response in "answer quickly and without thinking" (Protzko et al., 2019) presented two studies of 1500 subjects each. The results supported that participants, when given time to respond, may go to their "true self." If time was short for responding, they appeared to present themselves in ways to look good to others.

This finding informed my study as I balanced, because of multiple interruptions, respondent disruption and the possibility of getting more compliant responses to "speed things up." My methods for reducing the reasons for satisficing and socially desirable responding was to follow the support of Protzko et al. (2019) for giving participants enough time to respond so they were not rushed. Using the fifteen-minute response window permitted the transition from whatever one was doing to self-report on one's phone. It took away the "oh my god, I missed it!" fear. My other remedy for the very real validity issues of satisficing and socially desirable responding was to sharpen the sampling to two frequency and six factor questions, each clearly stated and sequenced. As the questions became familiar upon repeated notifications, the respondent was able to give "in the moment" responses without survey novelty. I recognized that smoothing the experience sampling ran the risk of reducing engagement in the experience self-report by making it too fast, too easy. But if the participant's sense of his or her experienced answer is just as easy to report as a satisficing answer, this was the best I could do. I balanced the maker and taker relationship to seek honest reporting.

Probe-Caught Versus Self-Caught Self-Report

In the research of Varao-Sousa and Kingstone (2019), probe-caught mind wandering rates were compared to self-caught rates in the self-reporting of undergraduate students during lectures. The authors investigated whether there would be a difference between the reporting

rates of the two data collection methods. Finding none, the researchers concluded the probe-caught method was a reliable means to determine mind wandering frequency. The researchers posed that the self-caught method can be used with the probe-caught method without negative effects. The advantages of this were said to be the opportunity to collect more data (p. 241).

I observed that prompt choices of self-catch versus probe-caught were not interchangeable in a daily life study. Participants doing tasks in a lab had a short, standardized, much simpler task and context set up than participants in a daily life in the United States experience sampling study. In my study, working adults in the middle of work, family, or self-focused activities were on the go. Their multi-sourced demands contrasted with sitting in a lecture hall which is a passive and self-centered orientation. Self-catch would have placed the burden of when to report on the subject, and thereby, introduced a new source of subjective error as to when a subject was paying attention to thought, when the subject was hesitant to report, and when the subject was too busy to report. Self-catch would have generated reflective thinking about thinking. I avoided this error by only using notification-caught experience sampling for the participants in my daily life study.

Effects of Meta-Awareness

In their consideration of additional issues around self-catching self-report data, Zedelius et al. (2015) investigated the effects of motivating meta-awareness of mind wandering. The authors pointed out that mind wandering was an escape from conscious experience and said to occur without meta-awareness. However, they noted the advantages of having an awareness of mind wandering and cited studies that have shown that subjects were meta-aware of small amounts of their mind wandering (p. 45). In their research, Zedelius et al. offered incentives to

motivate self-catching as participants thought that the researchers were able to see if, in fact, they were mind wandering. The authors found that increasing self-catching when motivated to do so did not yield more mind wandering. The researchers considered that meta-awareness could cause short-lived adjustments of behavior.

In my study, although participants were not self-catching their mind wandering, the anticipation of notifications, the counting of them, the two-hour time frames in which these would randomly occur, knowing that the end goal was a completed number of notification surveys, all of these and any of these could be related to meta-awareness and self-catching. Participants might have honed a certain meta-awareness concerning their mind wandering as the repeated questions increased their awareness of the elements of their mind wandering episodes. When a participant received smartphone app notification up to 30 times in my study, that participant could have anticipated notifications. As well, my study had a certain novelty of request as it may have been the first time that the idea of looking at one's mind wandering had been suggested to a participant. Experience sampling may have generated a self-consciousness chicken and egg phenomenon, that is, which came first, my mind wandering or my mind wandering about mind wandering? In this experience sampling, I made sure that participants knew that while it is common to mind wander, it was just as common not to mind wander.

By designing the study to use 1-minute surveys, I aimed to help participants get past the idea that one can "just know" when someone is mind wandering, that her or his eyes look into the distance with head raised and paused, a slight sense of emotion, as in Figure 3.4. This gaze was not a sure indicator of mind wandering any more than a head down at a kitchen sink or a slumped posture in a chair at a meeting could be construed as indicative of thought about things other than what someone was doing. Mind wandering may have no visible evidence.

Figure 3.4

The Gaze, Chin, Hair That Mislead.

Note: *The Gaze, Chin, Hair That Mislead.* Copyright 2022 by Paula C. Lowe.

Complexity of Daily Life Situations

Linz et al. (2021) conducted a study intended to see how mind wandering content differentially translated from the lab to daily life. The significance of their research for my inquiry was that most of the studies cited in the mind wandering literature have been conducted in a lab during short-lived contrived tasks; it was critically important, when comparing protocols and outcomes, for me to read the results of other research that left the lab to go out into real life.. Linz et al. explained that daily life situations present more complex ecological contexts that may incomparable to lab circumstances. As well, during my data collection, working adult daily life in the United States was morphing from a full-on Covid everywhere to "let's take a break" phase. These complex ecological context realities added difficulty to compare the data from a working adult sample with university convenience samples. However, the lack of comparability was also an opportunity. This study provided a dissonance (Wergin, 2018) to encourage further studies with working adults.

Another issue for daily life experience sampling was the frequency and cognitive disruption caused by event change. I provided research on the differences in mind wandering associated with low demand or high demand activities in Chapter II. Faber et al. (2018) investigated the effect of changing activity on mind wandering, that is, breaking the continuity of what one was doing. Specifically, the authors looked at event change and self-reports of mind wandering. They found that event change directed attention to stimulus processing and away from mind wandering. In other words, subjects stayed engaged in what they were doing as what they were doing transitioned to something new. Faber et al. attributed the effect to stimulus processing (p. 136) and posited that it decreased the rate of reported mind wandering because the change in tasks caused subjects to anticipate event boundaries.

Although the research by Faber et al. (2018) was lab-based with undergraduate students, I asked about context and context demand in my survey both for those who said they were mind wandering and for those who said, no, not mind wandering. Faber's research has implications for the rates of mind wandering for those respondents working in high event change jobs, none the least of which is parenting. It also has implications for the mind wandering rates reported by those in low event change jobs. I sought to capture a bit of this by asking about context demand.

Probe Rate, Response Options, and Framing

Mind wandering is, by definition, a subjective experience (Seli et al., 2013). Given this, the rate researchers administer thought probes in an experience sampling study was relevant to my study. Seli et al. highlighted the issues of probing too often or too infrequently and stated the rate of probing should be considered as it could affect the participants' reports of mind wandering. Their study involved 47 women, mostly students, mostly (77%) undergraduate students who had taken part in a previous laboratory testing session performing a metronome

response task in a lab setting, with varying number of probes ranging from five for some

respondents to 25 for others with mere minutes between probes (p. 3). They found that more

frequent probing in a shorter time resulted in less reported mind wandering. The probes occurred

during a continuously tedious task, and the researchers did not assert that their study findings

would bear out in studies conducted in naturalistic settings. However, they posited the practical

importance of the researcher considering probe rates and that longer durations without probes

could be associated with higher rates of reported mind wandering.

Robison et al. (2019) examined the ways in which manipulating frequency, response

options, and framing affected responses to thought probes. They supported experience sampling

as having the advantage, in short and immediate answer format, to avoid memory biases.

However, they noted the lack of standardization in studies using thought probes. They said that

too few probes reduced variability across individuals, but too frequent probes could be annoying,

potentially leading to participants responding in habitual ways. A second issue they brought

forward was responses. This included binary response options (e.g., are you doing this or that),

types of states (i.e., on task, distracted, mind blanking, mind wandering), or reporting thoughts

on a scale of engagement. Each response option has benefits and costs. The binary forced a

choice that was not clear. The types of states invited reflection on one's activity. The scale of

engagement provided "a bevy of response options that may overwhelm" (p. 6). A third source of

variation Robison et al. discussed was framing. They said some studies asked broadly, "what are

you thinking about?' and others used "are you mind wandering?" In addition to framing, the

researcher must be careful about priming participants to think about mind wandering in a certain

way in the study introduction and directions. In their work, they told participants that mind

wandering was normal and commonly occurring. However, they acknowledged that respondents

still might not report mind wandering because of social desirability bias that having one's thoughts moving around was not desirable.

I conducted my research in a naturalistic setting and did not standardize timing of notifications to match an activity as can be done in laboratory studies. My sampling notifications came during complex engaging activities as well as during boring or undemanding activities. The notification rate in my study was six times a day across up to five days in both work and home settings. I used the same framing, using "mind wandering" in descriptive variable questions, and avoided forced choices by offering an alternative response choice, e.g., "other things not listed."

Step 4: Write Onboarding and Experience Sampling Surveys

The onboarding and experience sampling surveys were written to be read on a phone. The questions were as unadorned as possible. The onboarding survey took 1–3 minutes to complete. The experience sampling survey required an average of 30–40 seconds to complete.

Onboarding Questions

In accordance with research question number one (RQ1), the following ten questions were asked of all working adults who chose to onboard this study as described in Step 6 of this chapter. The descriptive statistics were limited to information that would be used during the analyses of the data, i.e., parent status and gender, and demographic information to demonstrate different living situations, education, work, etc. of the participants. Table 3.2 displays the questions for the onboarding survey. This codebook is also included in Appendix G: Mind Wandering Study Codebook: Onboarding Survey.

Note that participants who answered no on parent status then skipped the question on parent situation and continued to age group. All participants were required to complete this onboarding survey, in addition to giving informed consent to proceed with the study.

Table 3.2

Mind Wandering Study Onboarding Survey

Age	Were you born between 1971 and 1996?	1 = Yes, 2 = No
USA (verified by GPS)	Do you work and live in the United States?	1 = Yes, 2 = No
Work location	How would you mostly describe your work location?	1 = At my employer's location, 2 = At home, 3 = A variety of places
Parent status	Are you a parent?	1 = Yes, 2 = No (skip logic if 2 to AGROUP)
Parent situation	How would you describe your parenting situation?	1 = Children live with me, 2 = Children live part-time with me, 3 = Children live mostly in another household, 4 = A combination of living situations
Age group	Which age group describes you?	1 = 25–32, 2 = 33–42, 3 = 43–50, 4 = An age not listed here
Community	How would you describe where you live?	1 = City, 2 = Suburb, 3 = Town, 4 = Rural
Education	How would you describe your level of education?	1 = High school or GED, 2 = Job training/some college, 3 = Bachelor's degree, 4 = Graduate degree
Gender	How would you describe your gender identity?	1 = Female, 2 = Male, 3 = Transgender female, 4 = Transgender male, 5 = A gender identity no listed here
Race	How would you describe your racial identity?	1 = Caucasian or White, 2 = African American or Black, 3 = Hispanic or Latino, 4 = Asian or Pacific Islander, 5 = Native American, 6 = Multi-racial, 7 = racial identity no listed here

Experience Sampling Questions

Table 3.3 provides the experience sampling survey. There were two frequency questions.
If the respondent answered no to Q1, not mind wandering, skip logic sent the person to Q6, Q7,
and Q8. If the respondent said yes to Q1, all questions were posed and answered. A final text box

was offered for participant to share any comments about the experience. If the respondent had no comments, she or he typed no, and submitted the survey. This codebook is included in Appendix H: Mind Wandering Study Codebook: Survey.

Table 3.3

Mind Wandering Experience Sampling Survey Questions

Q1	MW	In the last few minutes, I was mind wandering about things not about what I was doing.	1 = Yes, 2 = No (Used skip logic to Q6 if answered 2)
Q2	MW_INTENTIONALITY	I was mind wandering because …	1 = I WAS OPEN to thoughts about other things, 2 = My thoughts about other things POPPED UP
Q3	MW_THOUGHT TYPE	I was mind wandering mostly about …	1 = Day-to-day things I need to do, 2 = Creative or interesting experiences, 3 = Things I'm trying to figure out or plan, 4 = Concerns or worries, 5 = Other things not listed
Q4	MW_CONTENT	My mind wandering thoughts were mostly related to …	1 = My work, 2 = My children, 3 = Other family members or friends, 4 = Myself, 5 = Other things not listed
Q5	MW_TIME	I was mind wandering about things happening mostly in the …	1 = Past, 2 = Present, 3 = Future, 4 = Never happened
Q6	CONTEXT	When responding to this notification, I was doing things mostly related to …	1 = My work, 2 = My children, 3 = Other family members or friends, 4 = Myself, 5 = Other things not listed
Q7	DEMAND*	When responding to this notification, I was doing tasks I consider …	1 = Very demanding, 2 = Demanding, 3 = Somewhat demanding, 4 = Not demanding
Q8	EMOTION	When responding to this notification, I was feeling mostly …	1 = Great, 2 = Very good, 3 = Pretty good 4 = Not so good
Textbox	ENGAGEMENT	Are there any comments you would like to add?	Text box for comments. 1 = Comments, 2 = No comments

The following section identifies methodology issues relevant to the eight questions in the experience sampling survey. I was able to mitigate certain issues while others were unfixable by their nature, and I recognized these as limitations for the study.

Q1: Mind Wandering

Mind wandering was the dependent variable in this study. Smallwood and Schooler (2015) said, "unconstrained mental processes are the norm rather than the exception for our species, and mind wandering provides a clear paradigm in which to understand their psychological features" (p. 489). For the purposes of my study, I defined mind wandering as "thinking that was not about what I was doing" While more complex definitions of mind wandering were prominent in various other studies, e.g., moving to and fro as in unguided thought (Seli et al., 2018, p. 482), my study used a simple task-related definition because participants, being new to a study on mind wandering, could have become reflective and lingered in their responses, in essence, "thinking too much about thinking." For participants to ask, was I thinking about something other than my task? Okay, not so hard. But if another stipulation was added, a judgment as to the thought moving to and fro, who or what generated it, participants could have become confused.

Stimuli issues deserved my attention. As presented in Chapter I, mind wandering research grew around agreement that mind wandering involved what Smallwood and Schooler described as perceptual decoupling to leave the current moment's activities (p. 487). Other researchers have taken Murray and Krasich's (2020) position, considered the standard view, that mind wandering was only mind wandering if the subject had task-unrelated, stimulus-independent thought (p. 2). Other researchers focused on mind wandering as internally generated thought that was not about the task at hand. I looked at these three and found them too complex for a study involving a naïve sample. For one, stimuli issues have no lines drawn and no sand to draw them. Sources of interruption and distraction in naturalistic setting studies are constant and endless for all of us every day. Our smartphones are a world of stimuli packaged in a slim device. "We are

not in Kansas anymore," was the phrase that came to mind as I designed a study beyond a university lab setting.

My research definition worked within the realities of life in which provocations for mind wandering were everywhere. For example, say a respondent was working at her kitchen table and her mind wandered to thoughts about making dinner. Was her mind wandering triggered by the environmental context, her own boredom with task, her own hunger, or seeing her son at his laptop doing his homework at the other end of their shared space? Were these stimulants or just facts of life? If a dad's smartphone was on his desk as it always is, did the presence of that phone then connect him to mind wander about google searches, videos, or texts he recently viewed? Or was the presence of his phone so common that it was as unremarkable to him as the desk at which he works? The distance between stimuli for mind wandering may be as close as a cup of coffee that has a particular association with a friend. What serves as source of thought for one person may be familiar and "part of the wallpaper" for another. It was beyond the scope or purpose of this study to unravel this ball of yarn. The definition for mind wandering in this study was simply having thoughts about something other than what one was doing.

To denude a participant's life of stimuli would be to return participants to contrived tasks in controlled settings for data collection. We would learn more about what working adults do when they are excerpted from their lives. That would defeat the purpose of finding out if mind wandering was a frequent part of working adults' thinking in daily life. Further, lab studies may present, in the absence of common surroundings and objects, a paradox of stimuli by being without familiar objects or context. This could create generalizability issues when applying findings to the busy world at large.

All of this is to say that for my study, as part of the study directions, the consideration of stimuli was not included in my definition The focus was to say if thought that was about the task at hand or about something else. The stimuli relationship with mind wandering has not been fully resolved in the literature. It was not settled within my study.

Word issues also deserved my attention. As described in Chapter II, mind wandering was defined as when the individual's conscious experience was not tied to the events or tasks one was performing (Seli et al., 2018). Other terms have included daydreaming (Antrobus et al., 1966), self-generated thought (Smallwood et al., 2013), spontaneous thought (Christoff et al., 2016), and spontaneous cognition (Andrews-Hanna et al., 2010). Having one's attention diverted away from the current task was such a common activity that estimates ranged from 20% (Seli et al., 2018) to 30%–50% of waking conscious experience was occupied by thoughts unrelated to a primary task (Franklin et al., 2013; Killingsworth & Gilbert, 2010). Researchers have not agreed on a unifying definition of mind wandering. Without this, researchers have been instructed, rather than spinning circles around a riddle, to clearly articulate definitions used in their research.

This researcher task motivated me to revisit the issues of terminology from a non-academic world perspective. Irving et al. (2020) brought out a critical aspect of mind wandering research when they stepped away from the experts' ring and into the field of inquiry itself. They asked, "what does mind wandering mean to ordinary people" (p.2)? Word issues were not just about better definitions. Irving et al. posited that the choice of words used by researchers have pre-existing cultural use and meaning. Therefore, to conduct my study, this advice reminded me that there are two sets of eyes on a mind wandering definition, those of the researcher and the participant. In studies heavily dependent on self-report, particularly during

experience sampling, word choices for all items and directions must be easy access for participants.

Q2: Mind Wandering Intentionality

Researchers have insisted on differentiating between intentional and unintentional mind wandering (Seli et al., 2015). Consistently, these two types of mind wandering are dependent variables in this study. The generally accepted position has been that intentional mind wandering occurred when the individual was open to or wanted to mind wander. The intentionally mind wandering individual's conscious experience has thus untied from her activity or context as she chose to think about something other than what she was doing. Research showed this happened more often when task demands were low, motivation to complete a task, regardless of complexity, was low, and/or the task was repetitious or monotonous (p. 757).

Seli et al. stressed that differentiating between deliberate or intentional mind wandering and spontaneous or unintentional mind wandering experiences was necessary as comingling these could lead to erroneous interpretation (p. 750). Researchers stated that these two types of mind wandering constituted different cognitive experiences; they have made the case that the distinction between them ought to continue to be a prominent focus in the research on mind wandering (Seli et al., 2016a). However, there continued to be disagreement. Murray and Krasich (2020) took issue with intentionality and claimed that either the standard view was in error or intentional mind wandering was nonsensical (p. 10).

With my study, I offered a third possibility. That is, language requires common experience for common meaning. As put forth by Irving et al. (2020), "mind wandering" was lifted from the language of "the folk" but has no one-size-fits-all definition. Perhaps "unintentional" was similarly a folk term used to deflect blame, to suggest "it just happened," or

"I didn't mean to do that." Maybe the term "intentional" inferred the opposite, agency, as in "I did it, I chose to do it." For intentional mind wandering, the individual folding laundry might say "I was doing laundry and I thought about …" We all have a sense what we mean by "I thought about …" It is when thinking about this or that is okay, but these thoughts are not sequential or planful. We are, at these times, free of the A + B = C thinking. Rather, we are open to emotional foreground and background, letting "that car is the best price" coexist with, "Jenny's Subaru was blue…"

This study did not resolve construct discussions in the field. My participants were given simple definitions. Intentional mind wandering was defined as having thoughts that were not about the what the person was doing that happened when the individual was open to thoughts about other things. Figure 3.5 depicts intentional or "wanted to" or "was open to" mind wandering. In this common situation, Sam was doing laundry. Doing laundry was low demand; Sam was open to mind wandering.

Figure 3.5

Intentional Mind Wandering: Open to Thoughts About Other Things
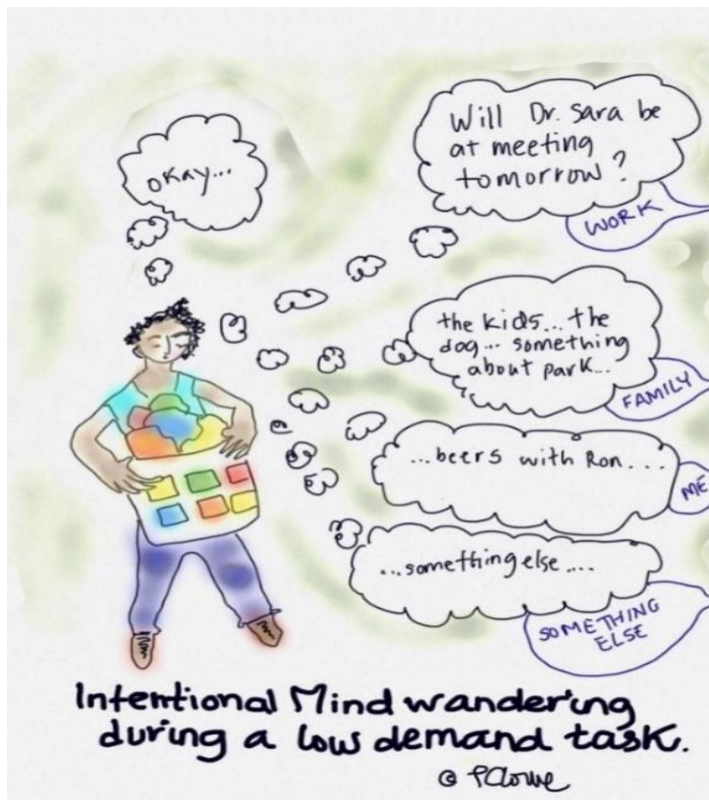
Note: *Intentional Mind Wandering: Open to Thoughts About Other Things.* Copyright 2022 by Paula C. Lowe.

      Unintentional mind wandering was said to occur when the individual did not choose to mind wander but was doing so nevertheless. Golchert et al. (2017) research into the brain's activity during intentional and unintentional mind wandering showed that spontaneous mind wandering differed from intentional as to the parts of the brain that are used and how these cooperate. The findings of Golchert et al. validated that unintentional mind wandering was a phenomenon that the brain engaged in given certain conditions, i.e., sustained high demand task, low executive control, and localized distractions. Because unintentional mind wandering pops up, often at inopportune times, it could be described as intrusive. But it may also, as this study asked, be associated with common thought types, i.e., day-to-day things I need to do, things I'm

trying to figure out, and other choices. Unintentional mind wandering was defined as having thoughts that popped up and were not about the what the person was doing.

Figure 3.6 depicts unintentional or "popped up" mind wandering. The drawing shows a common situation in which Julia was working. One of her mind wandering thoughts was about something else that popped up. I show multiple thoughts with varying sources of stimuli because the popped-up mind wandering may occur with a litter of thoughts. It is not as if one "clears the stage" to mind wander. Unintentional mind wandering can "just happen."

Figure 3.6

Unintentional Mind Wandering: Thoughts About Other Things Popped Up

Note: *Unintentional Mind Wandering: Thoughts About Other Things Popped Up.* Copyright 2022 by Paula C. Lowe.

I avoided the word "task" in my study. I was concerned about using it in my questions because of its historic association with productivity, an industrialized notion of accomplishment, i.e., milking a cow or pick axing into coal shale. As well, it was confusing term because many of us experience "doing something" as layered, e.g., "I was driving, listening to music, having a conversation with my child in the car seat behind me, when I unintentionally mind wandered about my boyfriend's cat." The "doing something" was "doing a bunch of things." Murray et al. (2020) stated that "tasks are concrete routines enacted through a series of coordinated, congruent actions to facilitate goals" (p. 3). We experience all sorts of activities that are far from coordinated, i.e., scrubbing a pan while crying, waiting for a bus listening to music, sitting in a meeting feeling your foot go to sleep. Murray et al. said it was important to understand the definition of task used in a particular study for credible mind wandering research. My study was about daily life activities. I asked if you were thinking about something other than what you were doing.

Q3–Q8: Descriptive Variables

Thought Type in this study gave participants several choices to categorize their mind wandering thought. The choices were *day-to-day*, *creative or interesting*, *figuring something out or plans*, *concerns or worries*, or *other things not listed*. The term "current concern" had been used in other research, but my researcher opinion was the use of this term brought a bias of "concern" or alert to the question.

Research established that the thought content of mind wandering may be different for intentional and unintentional mind wandering (Seli et al., 2017a). Thought content was what the thought type was related to, that is, *my work*, *my children*, *my family/friends*, *myself*, and *other*

things. In the data analyses, answers to these two questions, along with temporality, were linked using concatenation to describe mind wandering episode data.

Temporality in my study was the time frame of thought content as *past*, *present*, *future*, or *never happened*. Researchers looked at temporal focus and self-reflection in mind wandering (Smallwood et al., 2011), positing that intentional mind wandering was often about future events and prospection; unintentional mind wandering was often about past events or retrospection.

The question on context of mind wandering had two parts. First, it asked the respondent the context in which the mind wandering episode occurred, i.e., *my work*, *my children*, *my family members or friends*, *myself*, or *other things*. Second, it asked the participant to report context demand. This varied from very demanding to not demanding. Was changing the diaper complex? Or was getting a toddler to hold still while changing the diaper demanding? Or breaking up with a boyfriend on the phone? Demand was up to the individual's sense of the situation.

Emotion was defined as the feeling the participant was experiencing when mind wandering was sampled. Researchers found connections between mind wandering about the past being associated with negative mood, and mind wandering about the future being associated with positive mood or anxiety as described in Chapter II. This study asked participants to report their emotion ranging from great to not so good as a scale variable.

Step 5: Collect Experience Sampling Data

This section describes how I conducted my experience sampling study. This included securing my sample, using the Expiwell app, putting out the fires of unexpected challenges as I collected data, and paying participants.

Study Sample

To explore the mind wandering of working adults ages 25–50 with a particular interest in parents and nonparents, I sought a diverse sample. The costs to secure a purposive sample through a study participant company, e.g., Dynata or Prolific, proved beyond my budget. This "change of plans" became an opportunity. To generate a national sample, I employed convenience, voluntary response, and snowball sampling. Initially, these sampling methods are nonprobability sampling techniques a researcher uses to generate a sample from a target population, particularly when the population is large, as is the case with millions of working adults in the United States. My sampling also had aspects of purposive sampling technique, also called judgment sampling "because the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information" (Etikan et al., 2016, p. 2). The purposive aspects of my sampling were that subjects were working, living in the United States, and aged 25–50. These individuals volunteered to be in the study, were available during the week of the study, and were willing, after reading the study nutshell and sampling process, to install the Expiwell smartphone app, give informed consent, complete a participant profile, and submit up to 30 self-reports across five days of random sampling within six timeframes a day. I was also able to select the age group and gender populations for my ads to better get what I needed for this study.

I used email and social media to invite over 1,000 potential participants in my networks. I provided an informational invitation [see Appendix A: Study Flyer Invitation]. I sent out emails and postings on LinkedIn and Facebook. Despite curiosity and interest, only a few dozen chose to participate. I pivoted quickly, developed a one-stop shop study website, and used social media advertising to generate a national sample. In one weekend, I designed a study website with study

participation information in one place. Figure 3.7 provides the homepage for this website (see Appendix B). Appendix E provides the excerpted website page content.

I ran incentivized daily ads reaching 500 new Facebook and Instagram users, ages 25–50, every day for five weeks. This was doubled to reach more males. These social media ads reached over 24,000 potential participants. The ads offered incentives for qualified participants submitting a minimum level of participation in the study. Additional participants joined the study through snowballing with people they knew who had participated or learned about the study.

Out of this national outreach and social media ad campaign, roughly 10,000 visited the study website. These viewers, as indicated by their GPS, were from 50 states and a few countries. Of these, 868 individuals logged into my study, thereby generating a participant number, between mid-January through the first week of April 2022. My website host, Squarespace, offered me, as the website's administrator, real-time analytical data for website traffic and aggregate data about website visitors. I reviewed my website analytics every day during data collection. I saw where website visitors' locations, how much time they spent at the website, and the specific time they spent on a website page as well as their bounce rates to other pages. The analytics provided a world map and visitor counts and percentages to show website visitors located in every state in the United States as well as some other countries, e.g., Nigeria. This information helped me improve the website. For example, when the bounce rate showed me that most of my website visitors only went to "How To Participate" (see Appendix E). I added content to this page and used the page to communicate with the participants about such things as payment dates. When a few participants reported problems with receiving notifications, I posted tips on fixing this. I was also able to stress that the study was for those living and working in the United States and used GPS to determine location.

I worked with Expiwell's technical staff to address participant issues, conveyed to me at the website through the contact page, as these came along. One issue was about notifications. Many participants were not accustomed to an installed app notifying them and needed instruction to adjust their phone settings, e.g., silent mode, do not disturb mode, and airplane mode, so their notifications would alert them as intended. I reviewed participant real-time response rates on Expiwell's website where I had a "maker" account. I reviewed my study's participant log and CSV data. I appreciated the "study at a glance" bar charts Expiwell provided me. These gave me an overview of response patterns for all uncleaned data. I was able to see time-dated onboarding GPS, participation activity, and participant comments. In addition to website contact emails, these helped decide how long to run the Facebook ads and in what market. I was able to adjust the age and gender targets for Facebook ads to reach a robust population of potential participants.

Figure 3.7

Mind Wandering in Daily Life Study Website Homepage
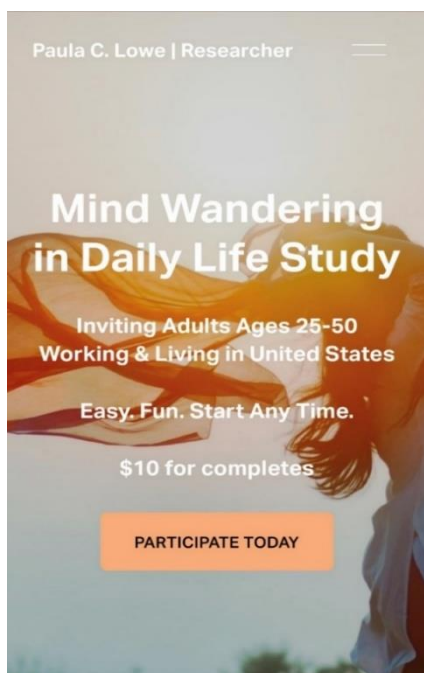
Note: Study Website Homepage. Copyright 2022 by Paula C. Lowe.

Figure 3.8 shows one such ad. These ads (see Appendix C: Mind Wandering Study Social Media Ads) invited viewers to join the study by directing them to go to my study website, www.paulaclowe.com, to read a study description, how-to-participate directions, frequently asked questions, and other information. Using a study website also gave me a way to answer participants' questions using a study contact email so that participation problems could be resolved. Of some 20 emails I received, participant comments concerned payments or about problems with notifications. I had no way to identify the data related to any participant who communicated with me using the website email.

Figure 3.8

Social Media Ad for Mind Wandering in Daily Life Study
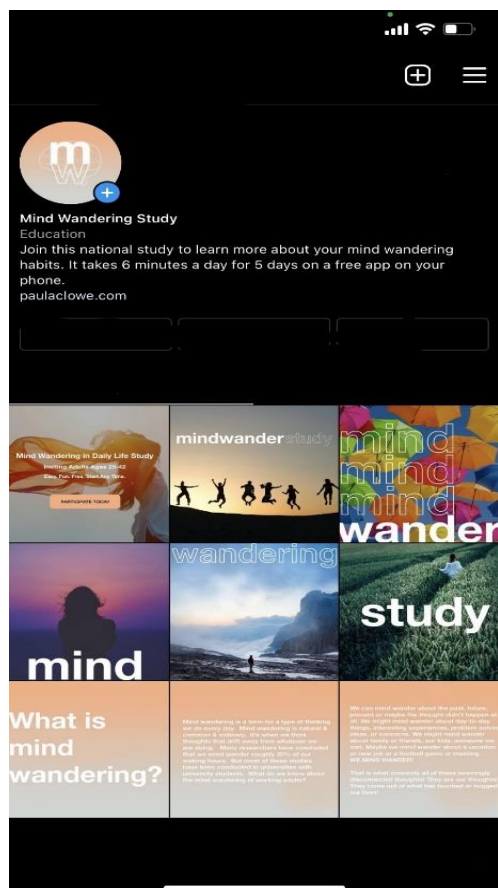
In every way that I could do so, my methods sought to increase a sense of trust, honesty, curiosity, and energy with participants who would never meet me in person. For all communications, I generated and used a study logo, shown in Figure 3.9, to distinguish emails regarding the study as professional, not personal (see Appendix D). This logo was used on all study reports and visuals as seen in Chapter IV.

Figure 3.9

Mind Wandering in Daily Life Study Logo

Note: Mind Wandering in Daily Life Study Logo. Copyright 2022 Paula C. Lowe

Each participant joined the study by installing the Expiwell app available in their google or apple play store to use on their Apple or Android smartphone. They opened the app, logged in using the study code, mind22, and their email. The app displayed start date choices using a calendar. Once the participant chose the day to start, which could be the day they logged in, he or she onboarded by clicking on the onboard survey (see Table 3.2) that provided study directions, informed consent, and ten participant profile questions.

On the day of the participants choosing, mind wandering experience sampling began. The time frames were 9–10 a.m., 10 a.m.–12 noon, 12 noon–2 p.m., 2–4 p.m., 4–6 p.m., and 6–8 p.m. Within each frame, a randomized notification would alert the participant to respond. The calendar showed participant if they had completed, missed, or had scheduled experience samplings each day of the study. The participants could leave the study at any time. If they met

the payment criteria, they did not delete the Expiwell app on their phone until their balance

showed $10 credit. They would then redeem this credit for a code for an Amazon gift card,

credited to their Amazon account.

All participants who qualified for payment—USA GPS, onboarding survey submitted,

minimum of 20 out of 30 experience surveys submitted—were paid using the Expiwell payment

system by April 10. A few last emails came from participants who had either a non-USA GPS or

not enough surveys submitted. At this point, the CSV data was reviewed and cleaned in EXCEL

and then readied for analyses in SPSS.

I have included additional details and lessons learned in Appendix I: Data Recodes,

Removals, and Missing Data During Selected Analyses.

Step 6: Research Data Analyses Strategies

To explore working adult mind wandering using my research questions (see Table 3.1), I

described and compared frequency and factor data for all participants, participants in the parent

and nonparent conditions, and by gender. I analyzed frequency data for mind wandering,

intentional mind wandering, and unintentional mind wandering using both participant-level

analyses and episode-level analyses to establish the rates of mind wandering episodes reported

by the participants in this study. I analyzed descriptive variable data for thought type, thought

content, and temporality, context, context demand, and emotion, consistently looking at all,

parent status, gender, and intentionality reported by working adults for their mind wandering

episodes. I ran chi-squared tests of significance for the relationship between the descriptive

variable category data and parent status, gender, and intentionality. I ran *t*-tests for comparisons

in rates of mind wandering, unintentional mind wandering, and intentional mind wandering. I

compared the context and context demands for episodes reported as mind wandering episodes

and non-mind wandering episodes. Finally, I aggregated the comments submitted at the end of each survey and sorted these by thought type and intentionality as these gave some detail to the mind wandering episodes reported by working adults.

Step 7: Ethical Considerations and Study Design Limitations

From a process point of view, participating in this study carried little risk. I minimized the experience sampling into eight questions, two frequency and six quick factor questions. I used language familiar to participants to make the process easy to complete. The website "How to Participate" page was complete such that a participant who visited no other sources of study information had enough information and directions on this page to join the study.

Ethical Considerations

Experience sampling in the naturalistic setting increased my responsibilities to minimize study intrusion into the daily life of respondents and for sampling to accentuate transparency and shared information. To avoid anxiety about notifications, something that could have negatively impacted the feelings reported for an episode, I gave respondents fifteen minutes to respond to a notification. While they seldom needed this, doing so respected their need to finish what they were doing before responding. It helped to keep participants from feeling caught off guard with little time. When the respondent did not answer, the notification was listed on the participant's app calendar as missed in that timeframe on that day. New notifications came in the next time frames. Those whose jobs involved customer service or hands-on work may either have not participated in the study or had fewer completions.

Safety was an important response and ethical issue. Participants were told not to answer a notification while doing things that required their focus, i.e., driving, doing physical task that could not be interrupted, or caring for a child in a way that interruption was unsafe for the child.

Privacy and anonymity were built into the design. While participants' log in information was kept at Expiwell, I did not have access to this information and had no way to identify a participant, even when that participant wrote to me via the website email with a study question. The Expiwell app had built in protections for respondent anonymity by de-identification of data so that personally identifying information was not required of participants. Each participant had a 20-digit randomized identification code that stayed with them in the CSV for both onboarding and mind wandering experience sampling data. A participant number for that individual made it easier for me to pay a participant and/or send messages to a participant number without knowing what person corresponded to that number. Data were also encrypted and stored on cloud-based storage. Data were only available to me. Informed consent was given during onboarding. I did not use the data of any participant who did not submit an onboarding survey and informed consent even if that person submitted experience sampling surveys.

The study was piloted with forty volunteers before being open to participants generated via the Facebook ads. This assured that the experience sampling using a smartphone app with randomly timed notifications was working for participants in real time. This ethical consideration assured that the participants had what they needed to produce data wherever they were while in the study.

Study Design Limitations

By conducting my experience sampling with working adults in daily life, I collected data from a new sample population. However, certain data collection limitations must be noted. First, I used a combination of convenience, volunteer, and snowballing sampling method. This included email and Facebook ads to known networks and unknown others. I called this process "casting a wide net." Though it was considerable work for me, I was able to bring diversity,

national participation, and best of all, non-university participants into the study. In doing a study welcoming all participant submissions in a naturalistic setting, it was not possible to force all participants to complete at a certain rate. Things come up. Notifications may have been missed when doing such things as driving. Incentivizing encouraged a higher per participant number of responses but incentivizing to completion rate may also emphasize quantity not quality, e.g., quick response to get it done.

A second design limitation was the backside of "newness." This general population sample may have had little experience with self-reporting a "state of mind" related to their activities. This study required downloading a new app, setting up one's phone settings to receive notifications, and the learning curve to get used to the sampling process. Some may have discontinued participating in the study because of difficulties installing the app or setting up notifications.

Third, working adult daily life conditions were considerably varied, and with my wide net, subjects were responding during noise, discomfort, personal fatigue, and more. Those in certain work settings, i.e., fast-paced restaurant or dusty construction site, may not have participated. Parenting situations may also have impacted participation. For example, parents of young children may have found it difficult to stop what they were doing with their infants and toddlers to answer the notifications. Lastly, I could not account for the possible effects on respondent mind wandering caused by energy drinks, coffee/caffeine, alcohol, drugs, or underlying health conditions at the time of sampling. Further, to accommodate a 1-minute sampling frame to avoid reflective thinking, only eight questions were asked, thus not all information about mind wandering was sought for this study so the study was limited in scope.

All in all, my methodology presented opportunities to give voice to the mind wandering of working adults across the United States at the start of the third year of the Covid Pandemic and to inform future research on mind wandering with a working adult population.

CHAPTER IV: FINDINGS

Each piece of wood in your house—from the windowsills to the furniture
to the rafters—was once part of a living being, thriving in the open
and pulsing with sap … if you know how to listen, each ring describes
how the rain fell and the wind blew and the sun appeared every day at dawn.
—Hope Jahren, *Lab Girl*

In this study, I explored mind wandering in daily life using an experience sampling methodology and a national sample generated through social media. I collected 1-minute survey data from adults ages 25–50 living and working throughout the United States. The purpose of this study was to examine mind wandering frequencies and episode characteristics as reported by participants within two conditions, parent status and gender, to begin to establish features of mind wandering episodes for working adults. I sought data to illuminate the ways and contexts in which parenting status and/or gender related to mind wandering. I learned how to listen to these data that were once parts of lived experiences, thousands of lived moments in time. For me, these reports had been alive, coming through brains into bodies on to fingers into smartphones. Nothing in prior my work prepared me for the sheer excitement and anxiety I experienced as I analyzed this study's mind wandering episode data.

These data were generated using snowballing, volunteering, and convenience sampling conducted between January 15 and April 10, 2022, two years into the Covid 19 pandemic. I distributed email invitations to multiple personal and professional networks to reach approximately 1,000 potential participants. I placed Facebook ads every day for five weeks, reaching roughly 18,000 working adults in the United States. Of these, over 8,000 visited my study website to learn more about the study. Of those who chose to participate, I collected experience sampling data by using the Expiwell phone app. During data collection, I administered my study website through Squarespace Analytics. Each day, I reviewed the sources

of website visits, Facebook and Direct, and where the visitors were located when they visited the website. I concurrently reviewed my study's Expiwell participant log and CSV files to gauge if participants were entering the study and responding smoothly. I observed the percentages of completed experiences, GPS, and time stamps for participants. I closed the study when I was confident I would have sufficient data, even after cleaning, for my analyses.

Data Cleaning

There were 861 potential participants who opened the study app through Expiwell to establish a participant number. Several steps were taken to remove ineligible cases from the data file. I reviewed the experience sampling data to make sure that participants met the study criteria in seven exclusion categories as summarized in Table 4.1. The first three categories were pre-registration exclusions, that is, participants were told prior to joining the study that they must live and work in the United States, submit an onboarding survey that included informed consent, and be 25–50 years of age. For location, study participants generated a GPS location when they onboarded the study using the Expiwell app. This GPS was used to determine if they were in the United States during the study. As the table shows, 162 participants had non-USA GPS, all but two of these reported locations in Nigeria. For onboarding and consent, participants gave informed consent to be in the study. Fifty-seven participants logged into the study but did not submit an onboarding survey and were excluded. Another 58 onboarded but did not submit any mind wandering experience survey data. Five participants submitted no onboard survey but did submit mind wandering surveys. These participants were excluded as they lacked informed consent to use their data. Further, in the onboarding survey, participants indicated that they were in one of three age groups for the study. Consequently, 48 participants were excluded as they reported being in an "age group not listed here."

For data cleaning, post-registration exclusions were related to analyses run to assess minimum self-effort. As Christiansen et al. (2003) pointed out, "it is each researcher's responsibility to set criteria for exclusion and to apply them fairly across all participants in their sample" (p. 74). I set a sufficiency level for submitted mind wandering surveys.

Insufficient data for analyses included 57 participants who submitted 1–3 surveys as this meant they started and quickly dropped out of the study. Five participants responded that they never mind wandered across several days, thus generating no mind wandering data to analyze. The data were analyzed in SPSS for multivariate outliers. I used the Mahalanobis distance test which is "an effective multivariate distance metric that measures the distance between a point and a distribution. It is an extremely useful metric having, excellent applications in multivariate anomaly detection, classification on highly imbalanced datasets and one-class classification" (Prabhakaran, 2019). The Mahalanobis multivariate outlier test was applied to the pattern of responses to five questions for all mind wandering episodes as well as for demographic subgroups. Table 4.1 shows that 31 participants were removed due to outlier response pattern. I further assessed self-effort by analyzing response times generating an average response time for each participant. When response time was particularly low, roughly 20 or fewer seconds to complete what other participants on average used 40 seconds to answer, I then looked at response patterns for that participant and whether the participant had submitted comments as an indication of engagement. I removed 12 participants due to low self-effort response patterns, such as survey response time below 20 seconds plus patterned responses, e.g., 1111111.

The frequencies of mind wandering for this working adult ages 25–50 population in a naturalistic setting were not established prior to this study. When data showed that many

participants reported always mind wandering when notified, I consulted with my external committee member as to whether this was possible. Because the participant had up to 15 minutes to notice and/or reply to the prompt, I deemed it potentially compliant and within reason for the reporting of mind wandering for every prompt. However, because this mind wandering response rate was higher than in other research, I combined the results of the data set Mahalanobis distance test and the data response time test to identify participants that I then visually reviewed for repeated patterns before determining that a participant in this "100% mind wandering" category of respondents would be excluded from the study. Of the 31 participants excluded based on outlier data determined by the Mahalanobis distance test, seven of these were participants who reported always mind wandering.

Table 4.1

Data Cleaning Exclusion Categories (N = 861)

Category	Study participants	Deleted	Detail
Participants with participant numbers	861		
Non-USA GPS	700	161	USA study
No onboard + no surveys	642	57	No data submitted.
Onboard + no surveys	584	58	Permission to use data. No data submitted.
No onboard + surveys	580	5	No permission to use data. Data unusable.
Age not in study	532	48	Age not in sample population frame of 25–50.
Insufficient experience surveys	475	57	1–3 submitted surveys. Below minimum.
0% mind wandering	470	5	No mind wandering for analyses.
Mahalanobis distance analysis	439	31	Outlier response pattern.
Low-effort response	427	12	Patterned response patterns + below minimum survey time + no study engagement comments.
Total participant data deletions		434	
Total participants in study	427		

I offer three data cleaning and oversight observations as conducting an experience sampling mind wandering study with a national sample of working adults assembled

through Facebook ads entailed several "special attentions." First, I planned for bots, a software application that runs automated tasks over the internet to appear as human activity. The design of the study, i.e., login process, randomly timed engagement over several days, GPS and time stamped responses, thwarted participation in the study by bots. If these did attempt to sneak in, the data cleaning methods were thorough, methodical and redundant. Second, I planned for "too quick." While I strove to be minimally intrusive by designing a survey that was easy to answer, surveys that were finished too quickly were assessed for possible low self-effort as described earlier. Third, I gave opportunities for participant comments at the end of each episode survey. This respected participants who wanted to say more using a textbox for comments. Participants submitted 614 episodes that included comments. Over the course of the study, I was told about weddings and family illnesses, and a handful of times, that participants reported that they liked being in the study. These comments helped me stay open about participant data all the way through the analyses reported in this chapter. I established an engagement variable such that the comments were an added indication of extra self-effort. Participants who were excluded from the study due to other measures of low-self-effort had not submitted comments. A selection of comments about intentionality and thought type are in a table at the end of this chapter.

Episode Data Recodes, Removals, and Missing Data

Before embarking on this study's analyses, I want my readers to understand why certain tables for analyses have different totals. While participants submitted 4,294 mind wandering episodes, not all cases were used for all analyses. Table 4.2 gives a summary of the recodes, removals, and missing data (see Appendix I).

There were three reasons for different case numbers in the analyses. The first concerned gender data used in the descriptive variable analyses. Three transgender male nonparents participated in this study. Their episode data were included when the analyses did not look specifically at gender differences. Their data were missing, due to insufficient cell size, $n = 25$, during analyses for gender.

The response categories of *other things not listed* and *never happened* were offered to participants to avoid a forced choice of picking something that seemed to not really fit. These data would commonly be included in the analyses. However, these response choices lacked definition to say more about them and produced few responses per cell when spread out amongst parent status, gender, and intentionality. Please refer to Appendix K: Methodology Notes for more detail on the distribution of these data across the items for participants in parent status and gender conditions.

Content responses for *my children* submitted by nonparents for the survey thought content question were removed. These participants indicated they were not parents and did not have children when they completed the study's onboarding. There was insufficient cell size to analyze these episodes as to why they might have been selected so these were removed from thought content data. Similarly, for the context question, there were 57 cases of *my children* reported by nonparents, mostly not from the same participants. These respondents had not self-identified as parents during onboarding, Thus, these cases were also removed from the analyses of context data.

Recoding was used for the survey thought type question response data. Once the first analyses was run for all episodes, *day-to-day things I need to do* and *things I'm trying to figure out or plan* were recoded into practical thoughts. This recode allowed me to see these

data more clearly as either *practical thoughts*, *creative or interesting experiences*, or *concerns or worries*. This was particularly important when comparing the intentionality type data for parent status and gender.

I used crosstabulations for RQ4. These analyses allowed me to link the answers to two or more experience sampling survey questions within mind wandering episodes. I wanted these within episode data to be understood statistically and narratively. All mind wandering episodes were included for mind wandering episode analyses. For the third question, the full 7,947 notification episode data, including both participant mind wandering episode and non-mind wandering episode data, were compared for context demand and emotion at the time of the notification. These data were then investigated as to parent status, gender, and intentionality for responses indicating mind wandering episodes.

Table 4.2

Data Recodes, Removals, and Missing Data During Selected Analyses

Mind wandering episode data		Cases removed	Cases missing	$N =$
Descriptive variable	Recode/removed/missing data			
Mind wandering frequency	All mind wandering episodes			4,294
Thought type	Recode for Practical Thoughts by combining *day-to-day things I need to do* and *things I'm trying to figure out or plan*			4,294
	Missing data for *other things not listed* due to generalizability and insufficient cell size for analyses		208	4,086
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		28	4,058
Thought content	All mind wandering episodes			4,294
	Missing data for *other things not listed* due to generalizability and insufficient cell size for analyses		396	
	Removed *my children* from nonparent data	54		3,844
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		25	3,819
Temporality	All mind wandering episodes			4,294
	Missing data for *never happened* due to generalizability and insufficient cell size for analyses		152	4,142
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		25	4,117
Context	All mind wandering episodes			4,294
	Missing data for *other things not listed* due to generalizability and insufficient cell size for analyses		240	
	Removed *my children* from nonparent data	57		3,997
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		25	3,972
Context demand	All mind wandering episodes	0	0	4,294
	All participant episodes analyzed for RQ4	0	0	7,947
Emotion	All mind wandering episodes	0	0	4,294
	All participant episodes analyzed for RQ4	0	0	7,947

The Mind Wandering Episode Stories of Working Adults

At the start of Chapter II, I quoted Marvin Minsky (1986/2014), "The idea of a single, central Self doesn't explain anything. This is because a thing with no parts provides nothing that we can use as pieces of explanation" (p. 50). I return to this observation because it guided this study's data analyses process. To understand a phenomenon, a whole, we need to understand the parts that comprise the whole. I first share the results of the mind wandering frequency analyses for this study. This is followed by a long section full of descriptive variable data laid bare, table by table, to build the case for the differences in frequency lest the rates be a "thing with no parts."

The mind wandering episode survey asked two frequency and six descriptive variable questions. Participants could add comments in a textbox. Figure 4.1 offers a visual that may be useful to you as you read this chapter.

Figure 4.1

Two Frequencies + Six Characteristics = Mind Wandering Episode
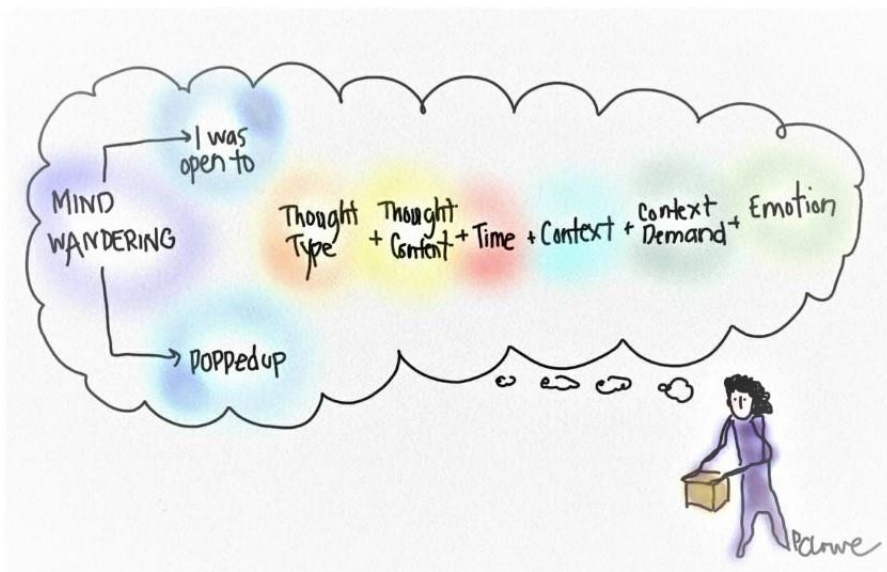
Note: Mind Wandering Episode. Copyright 2022 by Paula C. Lowe

While provided in Chapter III, I include these the survey questions in Table 4.3 for reference while reading Chapter IV. These items were sequenced to form episodes stories. These eight parts of mind wandering episodes reveal pieces of explanation.

Table 4.3

Mind Wandering Experience Sampling Survey Questions

Q1	MW	In the last few minutes, I was mind wandering about things not about what I was doing.	1 = Yes, 2 = No (Used skip logic to Q6 if answered 2)
Q2	MW_INTENTIONALITY	I was mind wandering because …	1 = I WAS OPEN to thoughts about other things, 2 = My thoughts about other things POPPED UP
Q3	MW_THOUGHT TYPE	I was mind wandering mostly about …	1 = Day-to-day things I need to do, 2 = Creative or interesting experiences, 3 = Things I'm trying to figure out or plan, 4 = Concerns or worries, 5 = Other things not listed
Q4	MW_CONTENT	My mind wandering thoughts were mostly related to …	1 = My work, 2 = My children, 3 = Other family members or friends, 4 = Myself, 5 = Other things not listed
Q5	MW_TIME	I was mind wandering about things happening mostly in the …	1 = Past, 2 = Present, 3 = Future, 4 = Never happened
Q6	CONTEXT	When responding to this notification, I was doing things mostly related to …	1 = My work, 2 = My children, 3 = Other family members or friends, 4 = Myself, 5 = Other things not listed
Q7	DEMAND*	When responding to this notification, I was doing tasks I consider …	1 = Very demanding, 2 = Demanding, 3 = Somewhat demanding, 4 = Not demanding
Q8	EMOTION	When responding to this notification, I was feeling mostly …	1 = Great, 2 = Very good, 3 = Pretty good 4 = Not so good
Textbox	ENGAGEMENT	Are there any comments you would like to add?	Text box for comments. 1 = Comments, 2 = No comments

I chose to use participant level and episode level data analyses for within episode examination as befitting my exploratory purposes for each research question. I selected both participant level and episode level analyses for the frequency of mind wandering and the two types of mind wandering, intentional and unintentional. In so doing, I wanted to

compare the episode level frequencies with the participant level frequencies to see how the study's "real world" rates aligned with the extant research in the field. I chose episode level analyses for the reported descriptive and comparative categorical characteristics of the mind wandering episodes, fully recognizing that the number of these episodes per participant varied between 4 and 24 and that, of course, the episodes were not independent of the participants experiencing them. While the collected data are sufficiently robust to consider future analyses with episodes nested within participants, the purpose of this dissertation was an exploratory look at the nature of the episodes coming from a diverse sample responding in the course of their daily lives. After investigating episode level descriptive variable data, I used episode level analysis to look within episodes, e.g., thought type and thought content, to learn about mind wandering episodes by putting pieces within episodes together. Finally, I compare the mind wandering and non-mind wandering episode as to context demand and emotion.

As the demographic tables display, the sample was drawn from across the United States in naturalistic settings of all sorts of workplaces, living spaces, communities, and personal lives that were not standardized. In this study, I sought to begin exploring the characteristics of mind wandering episodes.

Research Questions

This section begins with RQ1, who were the working adults in this study. I wanted to fully recognize the people who generated this self-report data. Researchers most often consider demographics as part of the study set up, the ingredients, not the cake. But if you have ever planned an event, you know that who you invited and how they participate IS the event. This study was populated by working adults, parents and nonparents, living in nearly all

states across the United States. The demographics for this study are presented in Tables 4.3 through Table 4.6 and build, as do the progression of tables in this chapter, a full picture by assembling the parts. I also included a table to present the age groups for the demographics. Did these volunteers share enough data on mind wandering? Yes, they responded to 7,947 notifications of which they reported 4,294 mind wandering episodes or 54% of the notifications.

For RQ2, I used both participant and episode level data analyses for the frequency of mind wandering and the two types of mind wandering, intentional and unintentional. These were run for all participants, parents and nonparents, and by gender. Conducting both types of analyses gave more surety to the findings. Again, I recognized that the number of these episodes per participant varied between 4 and 24, and that the episodes were not independent of the respondents who reported them but were events within a person's life that were independent of each other.

RQ3 entailed episode level data analyses for participants' responses to the six descriptive variable questions. For each question, the analyses began with all episodes, then parent status, gender, and intentionality. The final table for each of these questions pulled these parts together. The first four questions analyzed categorical data while the last two questions used scale data. I looked at these descriptive characteristics of the mind wandering episodes to see a part, as Minsky said, of the whole.

RQ4 selected three questions I had that related to the reported mind wandering episode experiences. For RQ4-Q1, I used cross-tabulation to link thought content and context within mind wandering episodes. This question related to Chapter I's presentation of human experience and whether working adults use mind wandering as a means for linking

parts of their lives. For RQ4-Q2, I used cross-tabulation to link thought type, content, and temporality. For RQ4-Q3, I looked at the reported context, demand, and emotion for all mind wandering episodes and non-mind wandering data. I included 7,947 episodes for these analyses.

RQ5 was the final piece for realizing mind wandering as "common and ordinary" thinking process in daily life. Of 614 episode comments submitted during data collection, I organized these according to intentionality and thought type to inform the study findings.

RQ1: Who Are You, Working Adults?

The first question was to determine if the sample was robust: Who were the participants in this study? What are the descriptive statistics for this working adult sample from the United States?

The 427 participants provided onboarding survey data for this study's demographic statistics. These participants responded to 7,947 experience sampling notifications, providing data for the primary focus of this study. I provide three tables of data for these statistics to reveal the variations in the parent status and gender demographics. These are further viewed through age group and gender lenses.

The frequencies and descriptive demographics for all participants are provided in Table 4.4. Parenting status showed that 65.8% ($N = 281$) of the respondents were parents while 146 participants were nonparents. The younger two age groups had the largest representation, with 144 in the 8-year 25–32 age group and 195 in the eleven-year 33–42 age group. The 43–50 age group had 88 participants.

Female participants made up nearly three fifths of the sample (58.1%) while male participants comprised two fifths (41.2%). Participant racial identity was White (66.5%),

Black (18.5%), and other racial identities (15.0%). Other identities were Hispanic (4.2%), Asian (6.8%), Native American (1.2%), and multi-racial (2.6%). One respondent identified as racial identity not listed here.

The Expiwell app provided GPS data to locate each participant as either in or outside of the United States during the study. I used website analytics to view my study website visitor map (see Appendix J: Mind Wandering Study Website Unique Visitors). These two data sources allowed me to determine that my visitors were well-distributed across the states. Certain more populous states had more study website visitors such as California, Florida, New York, Texas, and Illinois.

My research interest was to see not only distribution across regions, but across community types. These suggested what day-to-day life might entail, e.g., navigating freeways, taking a bus, or driving country roads to pick up kids or visit friends. City dwellers made up 52.0% of respondents while those living in suburbs were 28.1% of the respondents. Town residents comprised 11.9% of the participants, and those living in rural locations made up 8.0% of the participants.

Participants reported varying education levels with 42.2% of respondents having a bachelor's degree and 37.0% having a graduate degree. Job training or some college was reported by 15.0% of the sample while high school or GED was indicated by 5.9% of respondents. Although I did not ask about vocation since small cell size would preclude meaningful analyses in a small study, I did ask about work location as this related to the complexities of daily life, particularly during the Covid era. Over half (51.7%) of respondents reported working at their employer's location. Just 30.4% said that they worked at home, and

16.9% of respondents said they worked in a variety of places. From this I saw that 69.6% of

participants were leaving home to go to work on many of their workdays.

Table 4.4

Frequency and Percentage Distributions for Study Participant Demographic Characteristics (n = 427)

Variable	Categories	n	%
Parenting status	Yes	281	65.8
	No	146	34.2
Age group	25–32	144	33.7
	33–42	195	45.7
	43–50	88	20.6
Gender	Female	248	58.1
	Male	176	41.2
	Other	3	0.7
Racial identity	Caucasian or White	284	66.5
	African American or Black	79	18.5
	Hispanic or Latino	18	4.2
	Asian or Pacific Islander	29	6.8
	Native American	5	1.2
	Multi-racial	11	2.6
	Racial identity not listed	1	0.2
Education	High school or GED	25	5.9
	Job training / some college	64	15.0
	Bachelor's degree	180	42.2
	Graduate degree	158	37.0
Community	City	222	52.0
	Suburb	120	28.1
	Town	51	11.9
	Rural	34	8.0
Work location	At my employer's location	225	52.7
	At home	130	30.4
	A variety of places	72	16.9

Table 4.5 compared the demographics for the two primary study conditions, parents and

nonparents. The parenting situation question was asked of those who responded that they were

parents. Parents reported that their children lived with them in 87.9% of the parenting situations.

Children living with them part-time, in another household, and in a combination of places were much less common.

For parent participants, 54% were in the 33–42 age group, with the other half about equally divided between the younger 25–32 (20.3%) and the older 43–50 (25.3%) age group. Not surprisingly, nonparent participants were more frequently in the younger 25–32 (59.6%) and 33–42 (28.8%) age groups, with only 11.6% in the older 43–50 age group. Gender reports indicated a split for parent gender with 44.5% male parents, and 55.5% female parents in the study. The split was lopsided for the nonparent sample with males comprising 35.7% and females 64.3%. There were three respondents who identified themselves as other gendered. In data analyses that included gender, these three cases were treated as missing data due to small cell size.

While two thirds of parent participants identified as White (66.5%), the sample included a racially diverse group of parent respondents with 22.4% Black and the remaining 11.0% with a range of racial identities. Of nonparents, a similar two-thirds (66.4%) identified as White, with nonparents identifying as people of color comprising 33.6% of the nonparent sample. The "people of color" distribution varied somewhat from the parent group with 11.0% for both Black, and Asian/Pacific Islanders and the remaining 11.6% representing a range of other racial identities including Hispanic/Latino (6.8%) and multi-racial (4.1%). Education levels were comparable between parents and nonparents. Bachelor's degree was the largest educational level with working parents reporting 40.2% and nonparents indicating 45.9%. Graduate degrees were also reported at a similar rate. with parents reporting 37.4% and nonparents 36.3%. High school/GED was the lowest attainment level for both conditions with just 6.4% of parents and 4.8% of nonparents.

Community types were similarly identified for parents and nonparents. Work location showed differences as parents were more likely to work at an employer's location (56.9%) than various locations (14.2%). This combination of 71.1% not at home showed parents had less daytime flexibility to be in the home setting. By contrast, nonparents indicated 44.5% working at employer's location with one third of nonparents reporting that they were working at home.

Table 4.5

Frequency and Percentage Distributions for Demographics by Parent Status (N = 427)

Variable	Categories	Parent (n = 281)		Nonparent (n = 146)	
		n	%	*n*	%
Parenting situation	Children live with me	247	87.9		
	Children live part-time with me	16	5.7		
	Children live mostly in another household	6	2.1		
	A combination of living situations	12	4.3		
Age group	25–32	57	20.3	87	59.6
	33–42	153	54.4	42	28.8
	43–50	71	25.3	17	11.6
Gender	Female	156	55.5	92	64.3
	Male	125	44.5	51	35.7
	Other	0	0	3	0.02
Racial identity	Caucasian / White	187	66.5	97	66.4
	African American / Black	63	22.4	16	11.0
	Hispanic / Latino	8	2.8	10	6.8
	Asian / Pacific Islander	13	4.6	16	11.0
	Native American	4	1.4	1	0.7
	Multi-racial	5	1.8	6	4.1
	Racial identity not listed	1	0.4	0	0.0
Education level	High School / GED	18	6.4	7	4.8
	Job training / some college	45	16.0	19	13.0
	Bachelor's degree	113	40.2	67	45.9
	Graduate degree	105	37.4	53	36.3
Community	City	151	53.7	71	48.6
	Suburb	72	25.6	48	32.9
	Town	34	12.1	17	11.6
	Rural	24	8.5	10	6.8
Work location	At my employer's location	160	56.9	65	44.5
	At home	81	28.8	49	33.6
	A variety of places	40	14.2	32	21.9

Table 4.6 shows the demographics by gender. Females reported their racial identity was whiter (71.8%), less educated (27.9% less than a college degree), more likely to live in a suburb than a city (37.5%) than males in this study. The largest age group for females was 33–42 (42.7%), and they were more often working at home (41.1%) than males (14.8%).

Males in this study were more diverse than females with 40.9% of Color. They more frequently reported having bachelor and graduate degree education levels (88.6%), living in cities (70.5%), and working at their employer's location (64.2%).

This table provides parenting situation data. Only participants who said "I am a parent" on the parent question then responded to this question. All other respondents skipped the question of parenting situation. Of working moms in this study, 92.0% reported that they had their children living with them full time. Of the working dads in this study, 84.0% reported that they had their children living with them full time. Nearly ten percent said that their children were living with them part-time. Thus, of the parents in this study, nearly all had their children living with them, and their parenting responsibilities were daily and constant. The consequences of this "dual work" was evident in the descriptive variable data for parents' mind wandering thought types and content.

Table 4.6

Frequency and Percentage Distributions for Demographics by Gender (N = 424)

		Female (n = 248)		Male (n = 176)	
Variable	Categories	n	%	n	%
Parenting situation (parent only: female n = 156, male n = 125)	Children live with me	142	92.0	105	84.0
	Children live part-time with me	4	2.6	12	9.6
	Children live mostly another household	1	0.6	5	4.0
	A combination of living situations	9	5.8	3	2.4
Age group	25–32	86	34.7	55	31.3
	33–42	106	42.7	89	50.6
	43–50	56	22.6	32	18.2
Racial identity	Caucasian / White	178	71.8	104	59.1
	African American / Black	28	11.3	51	29.0
	Hispanic / Latino	11	4.4	7	4.0
	Asian / Pacific Islander	21	8.5	8	4.5
	Native American	1	0.4	4	2.3
	Multi-racial	9	3.6	1	0.6
	Racial identity not listed	0	0.0	1	0.6
Education level	High school / GED	22	8.9	3	1.7
	Job training / some college	47	19.0	17	9.7
	Bachelor's degree	93	37.5	84	47.7
	Graduate degree	86	34.7	72	40.9
Community	City	95	38.3	124	70.5
	Suburb	93	37.5	27	15.3
	Town	36	14.5	15	8.5
	Rural	24	9.7	10	5.7
Work location	At my employer's location	112	45.2	113	64.2
	At home	102	41.1	26	14.8
	A variety of places	34	13.7	37	21

Table 4.7 provides demographics for parent status informed by gender. Nonparents were younger with 64.1% of female and 49.0% of male nonparents in the 25–32 age group. Of parent

participants, female (53.8%) and male (55.2%) were in the 33–42 age group. Racial identity was highly reported as White in all four parent status gender subgroups, with female parents (71.8%), male parents (60%), female nonparents (71.7%) and male nonparents (56.9%) of their respective subgroups. One-third (33.6%) of male parents identified as Black. Other racial identities were roughly the same across the four subgroup conditions. Education level varied by gender within the parent condition. Nine out of ten male parents (92.8%) reported having a Bachelor or Graduate degree while two out of three female parents (65.4%) reported these degrees. Male (78.4%) and female (83.7%) nonparents indicated similar rates of college or graduate degrees.

For community, male parents (77.6%) and nonparents (52.9%) reported living in a city. By contrast, 34.6 % of female parents reported an urban community life. Looking at work locations for gender information, most male parents reported (72%) that they worked at employer's location. Combined with 17.6% working in a variety of places, male parents were away from the home the most of any group. Female parents had the highest at home location for work with 43.6%. Female nonparents reported 45.7% working at employer location, nearly the same as male nonparents (45.1%).

In Table 4.7, I have highlighted male parent demographic data as these inform the findings for the dads in this study. These highlights include age, racial identity, education, community, work location. I note that 55.2% of male parents reported their ages as 33–42, well into work responsibilities and family life. While this is comparable to female parents, it contrasts to nonparents who are predominantly in the 25–32 age category. Male parents reported racial identities as white 60% and Black 33.6% with just 6.4% other responses. Of these participants, 92.8% reported having bachelors or graduate degrees. They reported 77.6% of the time that they lived in a city. For employment location, 72% reported working at their employer's location,

working at home reported only 10.4%. Table 4.6 showed that 84% of male parents reported

living fulltime with their children, 9.6% part-time. The characterizations I drew from these data

were that the male parents participating in this study were highly educated, in higher work

demand at employer locations, and caring for children in their homes at night in urban

communities. This may have translated into commuting through traffic in the morning and

evening to get to work locations and return to be with family, not having easy access to family

members during the day, and, given the older age brackets, being further along in one's career

with possibly more responsibilities for work outcome.

Table 4.7

Frequency and Percentage Distributions for Demographics by Parent Status and Gender (N = 424)

| | | Parent (*n* = 281) | | | | Nonparent (*n* = 143) | | | |
| | | Female (*n* = 156) | | Male (*n* = 125) | | Female (*n* = 92) | | Male (*n* = 51) | |
Variable	Categories	N	%	n	%	n	%	n	%
Age group	25–32	27	17.3	30	24.0	59	64.1	25	49.0
	33–42	84	53.8	69	55.2	22	23.9	20	39.2
	43–50	45	28.8	26	20.8	11	12.0	6	11.8
Racial	Caucasian / White	112	71.8	75	60.0	66	71.7	29	56.9
	African American / Black	21	13.5	42	33.6	7	7.6	9	17.6
	All Other Hispanic / Latino	6	3.8	2	1.6	5	5.4	5	9.8
	Asian / Pacific Islander	11	7.1	2	1.6	10	10.9	6	11.8
	Native American	1	0.6	3	2.4	0	0.0	1	2.0
	Multi-racial	5	3.2	0	0.0	4	4.3	1	2.0
	Racial identity not listed	0	0.0	1	0.8	0	0.0	0	0.0
Education	High school / GED	16	10.3	2	1.6	6	6.5	1	2.0
	Job training / some college	38	24.4	7	5.6	9	9.8	10	19.6
	Bachelor's degree	52	33.3	61	48.8	41	44.6	23	45.1
	Graduate degree	50	32.1	55	44.0	36	39.1	17	33.3
Community	City	54	34.6	97	77.6	41	44.6	27	52.9
	Suburb	59	37.8	13	10.4	34	37.0	14	27.5
	Town	24	15.4	10	8.0	12	13.0	5	9.8
	Rural	19	12.2	5	4.0	5	5.4	5	9.8
Work location	At my employer's location	70	44.9	90	72.0	42	45.7	23	45.1
	At home	68	43.6	13	10.4	34	37.0	13	25.5
	A variety of places	18	11.5	22	17.6	16	17.4	15	29.4

The descriptive statistics for this study showed sufficiently representative data to run analyses for my parent and nonparent conditions as well as for gender and established the groundwork for insights related to analyses for various research questions. Because of the complexities of the layers and the purposes of this exploratory study, I did not run analyses for other subgroups due to insufficient or disproportionate cell size.

To put these data into a visual format, Figure 4.2 provides a view of participants' demographic data from the tables. This "sample at a glance" can be referenced to better appreciate the findings in this chapter. These data demonstrate, as we would expect, parent participants were older than the nonparent sample, but in both parent groups, females outnumbered males.

Figure 4.2

Working Adult Sample at a Glance
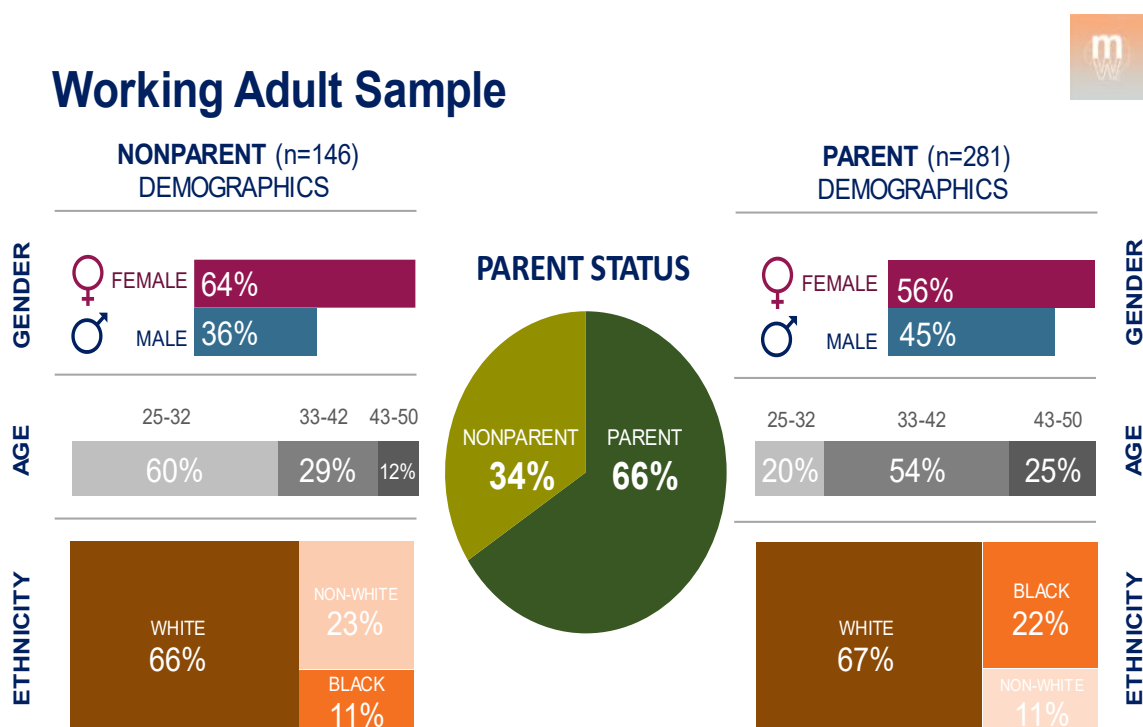
Note: Working Adult Sample. Copyright 2022 by Paula C. Lowe.

RQ2: How Frequently Did Working Adults Mind Wander?

My second research question concerned the frequencies of mind wandering for my working adult sample. What were the rates of overall, intentional, and unintentional mind wandering for all participants, by parent status, and gender?

As I explained previously, there were two methods for analyzing mind wandering frequency in my experience sampling study conducted in a naturalistic setting, that is, daily life. These were participant level and episode level. When experience sampling research is conducted in a laboratory setting, most often at a university, participation in a study may be standardized by participant type, time, place, contrived task, and completion rates of experience samplings. In my daily life experience sampling study conducted across the United States as described in Research Question 1, standardization was not possible. In fact, this variability was, the very variability in time, place, person, and task that I sought to explore. In daily life experience sampling, the researcher offers a full window of time to participate and sets a minimum submission compliance rate (Christensen et al., 2003).

Participant Level Mind Wandering Frequencies

To assess rates of mind wandering, I employed both participant level and episode level analyses to determine mind wandering frequencies. To partially account for the per person range of notifications participants responded to (4 to 24, with an average number of 18.6 responses), the raw numbers of notifications and mind wandering episodes were converted to percentages. When the data were viewed using the participant level lens, the average mind wandering frequency for all 427 participants was 55.1%. The 281 parents had an average mind wandering frequency of 59.4%, and the 146 nonparents averaged 46.9%. The *t*-test for these results showed a statistically significant difference between parents and nonparents, $t(429) = 4.689$, $p < .001$.

Table 4.8 provides the "by person" overall and type of percentage of notification mind wandering data by parent status and gender. *T*-test results showed statistically significant differences for parent status and gender. For parent status, the rate of all mind wandering was

higher ($M = 59.4$) for parents than for nonparents ($M = 46.9$), with $t(425) = 4.372$, $p < .001$. For gender, the rate of all mind wandering was higher for males ($M = 59.1$) than for females ($M = 48.4$), with $t(422) = -2.395$, $p = .017$.

To interpret the frequency of mind wandering episodes in this study, participants reported the intentionality of their mind wandering. Participants chose either intentional, "I was open to thought about other things," or unintentional "My thoughts about other things popped up" mind wandering. The frequencies for intentional and unintentional mind wandering were converted to percent of mind wandering episodes to partially account for the range in the number of mind wandering episodes per participants. *T*-test results showed a statistically significant difference for the rate of mind wandering by gender for intentional mind wandering, with a mean score of 59.6% for males compared to 48.4% for females, with $t(422) = -3.909$, $p < .001$. Similarly, there was a statistically significant difference for rates of intentional mind wandering by parent status, with a mean score of 56.4% for parents and 46.6% for nonparents, $t(425) = 3.330$, $p < .001$.

Table 4.8

Participant Level Average Percentage of Notifications With All, Intentional, and Unintentional Mind Wandering Episodes by Parent Status and Gender

Variable	All mind wandering	Intentional mind wandering	Unintentional mind wandering
	Average %	Average %	Average %
All ($n = 427$)	55.1	53.1	46.9
Parent status	***	***	
Parent ($n = 281$)	59.4	56.4	43.6
Nonparent ($n = 146$)	46.9	46.5	53.5
Gender	*	***	
Female ($n = 248$)	52.3	48.4	51.6
Male ($n = 176$)	59.1	59.6	40.3

Note: Notation for statistical difference across subgroups, * $p < .05$, **$p < .01$, and *** $p < .001$

To put these data into a visual format, Figure 4.3 provides frequency data "at a glance" to better appreciate the findings in this chapter. These data demonstrate parent participants reported mind wandering more frequently than nonparents. Males reported more often mind wandering than females.

Figure 4.3

Mind Wandering Frequency Participant Level
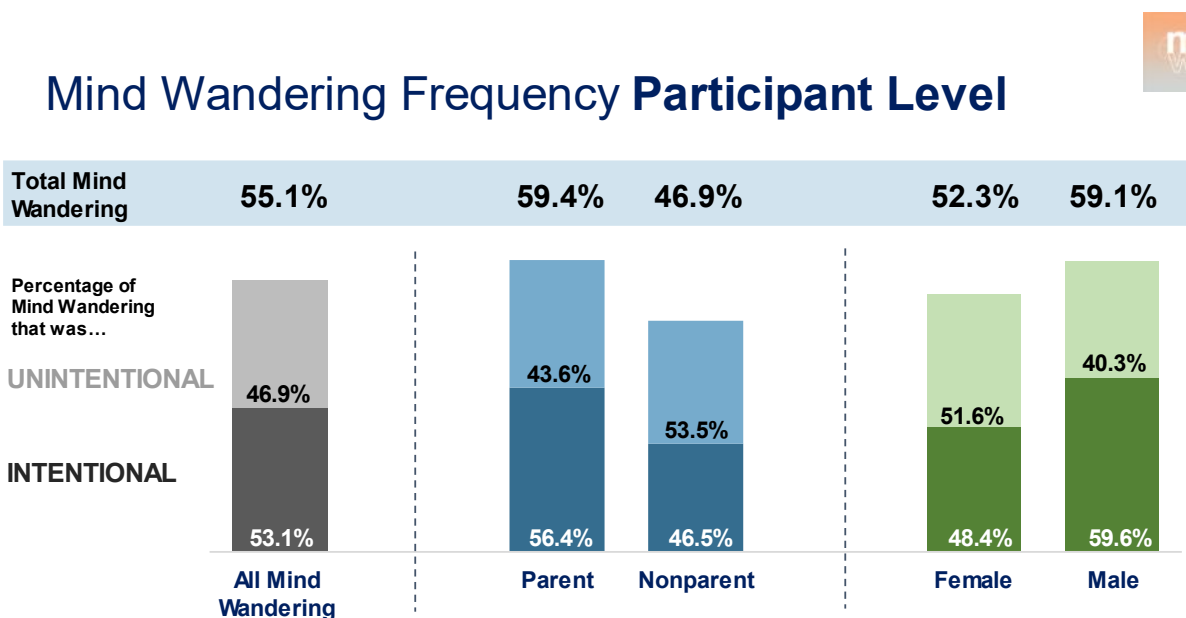
As shown in Table 4.9, further ANOVA with Tukey post hoc analysis showed that male parents had significantly higher rates of overall mind wandering than each of the other three parent status gender subgroups, with a mean score of 65.1% compared to 54.9% for female parents, 45.0% for male nonparents, and 48.1% for female nonparents, with $F (3, 423) = 9.756$, $p < .001$. ANOVA analysis for rate of intentional mind wandering showed that male parents again had significantly higher rates than other parent gender subgroups, with a mean score of 63.7% compared to the two female subgroups of female parent (50.6%) and female nonparent (44.7%) and their male nonparent counterpart (44.9%), with $F (3, 423) = 9.051$, $p < .001$.

Table 4.9

Participant Level Percentage of Notifications With All, Intentional, and Unintentional Mind Wandering Episodes by Parent Status and Gender

Variable	All mind wandering	Intentional mind wandering	Unintentional mind wandering
	Average %	Average %	Average %
Female parent (*n* = 156)	54.9	50.6	49.4
Male parent (*n* = 125)***	65.1	63.8	36.2
Female nonparent (*n* = 92)	48.1	44.7	55.3
Male nonparent (*n* = 54)	45.0	49.7	50.3

Note: *** Male parents had significantly ($p < .001$) different rates of intentional and unintentional mind wandering than the other three gender parent groups.

Episode Level Mind Wandering Frequencies

In this study, as I looked at episode level data reported at the time of notification, I found frequency of mind wandering over all notifications for all participants to be 54.0% as displayed in Table 4.9. Episodes reported by parents were again at a higher rate (58.2%) than by nonparents (45.5%). Thus, working adults who identified as parents indicated their mind wandering episode rates were roughly 28% higher than nonparents.

As found with the per person rates, intentional mind wandering for all episodes was reported more frequently (58.3% of episodes) compared to unintentional mind wandering episodes at 41.7%. When we look at parent status, parents indicated a higher rate of intentional mind wandering episodes (61.8%) than nonparents (49.1%).

When viewed from the "all notifications" and "all mind wandering" lens, the data show that the episodes reported by parent participants had a higher mind wandering frequency rate, and these mind wandering episodes were reported by parent participants to be more intentional than unintentional.

Similarly to the *t*-test findings on the by participant level, chi-square analyses for all mind wandering and parent status indicated a significant difference between the number of mind wandering episodes reported by parents and nonparents, with $\chi^2 (1) = 113.700$, $p < .001$). There was also a significant difference on parent status for intentionality, with $\chi^2 (1) = 57.522$, $p < .001$).

Table 4.10

Episode Level Average Percentage of Notifications With All, Intentional, and Unintentional Mind Wandering Episodes by Parent Status and Gender (N = 7,947)

Variable	Categories	All		Parents ($n = 5,352$)		Nonparents ($n = 2,595$)	
		N	%	N	%	n	%
Mind wandering***	Yes	4,294	54.0	3,114	58.2	1,180	45.5
	No	3,653	46.0	2,238	41.8	1,415	54.5
Mind wandering type ***	Intentional	2,505	58.3	1,926	61.8	579	49.1
	Unintentional	1,789	41.7	1,188	38.2	601	50.9

Note: ***Parent status had significantly ($p < .001$) different rates for mind wandering and for intentional and unintentional mind wandering.

Figure 4.4 displays these findings along with gender data so that we can easily see that parents reported more mind wandering episodes than nonparents, and males reported more mind wandering episodes than females with intentionality also being higher for parent and male participants. As the mind wandering episode characteristics data are presented in RQ3–RQ5, these differences will be informed by thought type, content, temporality, and more. Figures displaying the characteristics data will follow the tables in this chapter so that these patterns can be easily recognized.

Figure 4.4

Mind Wandering Frequency Episode Level
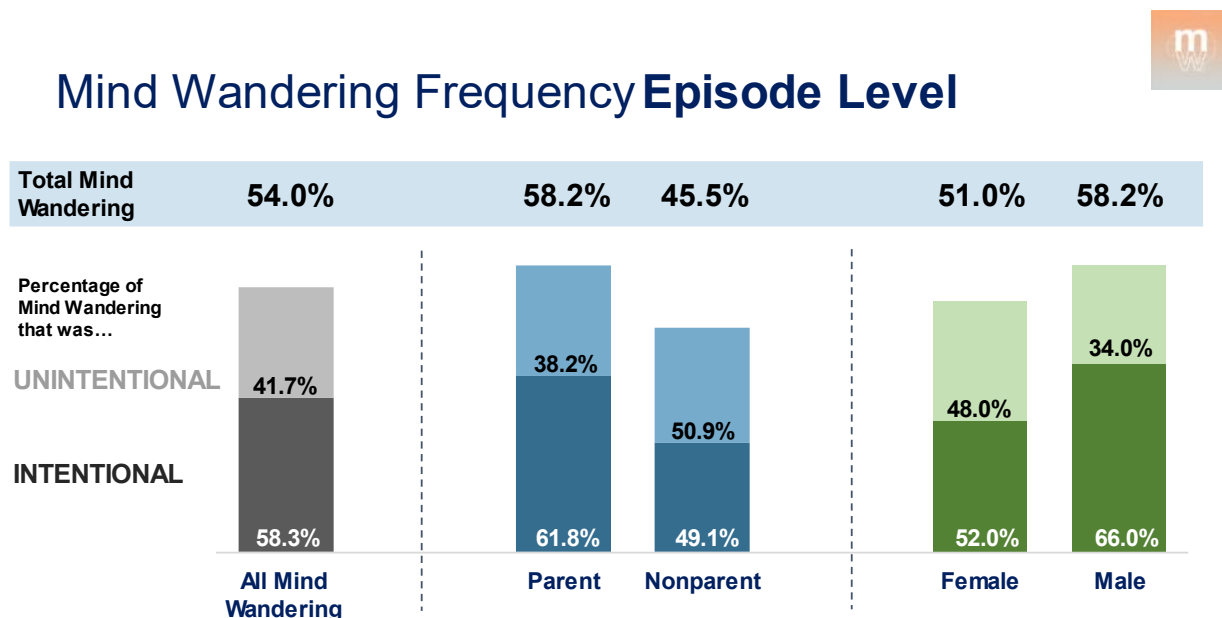
In conclusion, participant and episode level data results support that mind wandering occurred more often for parents than nonparents and that gender informs parent status. Both participant level and episode level analyses indicate that mind wandering was indicated by all working adults at a high rate (participant level, 55.1% and episode level, 54.0%). Further, parent reports of mind wandering were significantly higher (participant level, 59.4%, episode level, 58.2%) than nonparent reports (participant level, 46.9%, episode level, 45.5%). Intentional mind wandering was reported as significantly more frequently by parents (participant level, 56%, episode level 61.3%) than nonparents (participant level, 46.5%, episode level 49.1%).

RQ3: What Characterized Working Adult Mind Wandering?

My third research question concerned the descriptive variables that characterized and contextualized mind wandering episode data. What were the statistics for all, intentional, and

unintentional mind wandering experiences as to thought type, thought content, temporality, context, context demand, and emotion for all participants, by parent status, and gender?

Thought Type

In a study about how one thinks about things other than what one is doing, I decided the place to start was by looking at types of thought. When participants were notified to report mind wandering, respondents characterized each mind wandering episode by type of thought. As seen in Table 4.11, I offered choices that, by their inclusion, invited respondents to report types of thought people might have in daily life. These response options included *day-to-day things I need to do*, *creative or interesting experiences*, *things I am trying to figure out or plan*, *concerns or worries*, or *other things not listed*. Asking about these thought types was a way for this study to go beyond "bean counting" mind wandering episodes to look at the parts of the mind wandering story.

Table 4.11 presents all mind wandering episode data by thought type. *Day-to-day things I need to do* was the leading thought type for all participants (31%). When considered as "practical thoughts," including *day-to-day things* and *things I'm trying to figure out or plan*, over half (55.3%) of the mind wandering thoughts were about "practical" matters. *Other things not listed here* was reported for 208 episodes or 4.8% of the data.

Table 4.11

Thought Type for All Participants and All Mind Wandering Episodes (N = 4,294)

I was mind wandering mostly about …			
Variable	Categories	*n*	%
	Day-to-day things I need to do	1,329	31.0
	Creative or interesting experiences	1,107	25.8
Thought type	Things I'm trying to figure out or plan	1,045	24.3
	Concerns or Worries	605	14.1
	Other things not listed	208	4.8

Table 4.12 displays mind wandering thought type recoded data for parent status. *Day to-day-things I need to do* and *things trying to figure out or plan* were recoded as "practical thoughts." The difficult to classify *other things not listed* was removed after being analyzed for possible effects. The cell size for analyses was problematic as it was seldom reported across the parent status and gender groups (see Appendix K: Methodology Notes).

When viewed by parent and nonparent status, recoding the response categories to *practical thoughts*, and removing the difficult to classify *other things not listed*, the percentage distribution for practical thoughts episodes was roughly the same for parents and nonparents. However, parents reported fewer *concerns or worries* (12.8%) than nonparents (20.4%). A chi-square test of independence showed there was a significant relationship between thought type and parent status, with $\chi^2(4) = 98.135$, $p < .001$, with the significant variation clearly in the *creative or interesting experiences,* and *concerns or worries* categories. Separate simple 2 x 2 chi-square analyses for these two categories showed a significant relationship between *creative or interesting experiences* and parent status, with $\chi^2(1) = 7.762$, $p = .005$ and a significant relationship between *concerns or worries* and parent status $\chi^2(1) = 36.230$, $p < .001$. *Practical thoughts* showed $\chi^2(1) = 3.324$, $p = .068$ which was not a statistically significant difference. This means that both parents and nonparents reported practical thoughts, and practical thoughts are a common thought type (58.1%) of their mind wandering episodes.

Table 4.12

Frequency and Percentage Distribution for Mind Wandering Episode Recoded Thought Type for All, Parents, and Nonparents (N = 4,086)

		Total		Parents		Nonparents	
Variable	Categories	n = 4,086	%	n = 3,001	%	n = 1,085	%
	Practical thoughts	2,374	58.1	1,769	58.9	605	55.8
Thought type	Creative or interesting experiences **	1,107	27.1	848	28.2	259	23.9
	Concerns or worries***	605	14.8	384	12.8	221	20.4

Note: Statistically significant differences at $p < .001$ (***), $p = .01$(**) based on 2 x 2 chi square.

Table 4.13 provides gender data for thought type. This table shows that more *practical thoughts* mind wandering episodes were reported by females (62.3%) than by males (53.3%). *Creative or interesting experiences*, by contrast, were reported more by males (35.7%) than females (19.8%). Although the *concerns or worries* response option was not often selected, the *concerns or worries* episodes were more frequently submitted by females (17.9%) than by males (11%). A chi-square test of independence showed there was a significant relationship between thought type and gender, with $\chi^2(1) = 141.108$, $p < .001$. For gender, the episode data showed a difference between male and female reporting on all three thought content categories. Separate simple 2 x 2 chi-square analyses for these three categories showed a significant relationship between *creative or interesting experiences* and gender with $\chi^2(1) = 129.371$, $p < .001$, a significant relationship between *concerns or worries* and gender $\chi^2(1) = 38.398$, $p < .001$, and a significant relationship between *Practical Thoughts* and gender $\chi^2(1) = 33.669$, $p < .001$. Mind wandering episodes by females frequently focused on practical thoughts.

Table 4.13

Frequency and Percentage Distribution for Mind Wandering Episode Recoded Thought Type by Gender (N = 4,058)

		Total		Male		Female	
Variable	Categories	$n = 4,058$	%	$n = 1,881$	%	$n = 2,177$	%
Thought type	Practical thoughts***	2,360	58.2	1,003	53.3	1,357	62.3
	Creative or interesting experiences***	1,101	27.1	671	35.7	430	19.8
	Concerns and worries***	597	14.7	207	11.0	390	17.9

Note: Statistically significant differences $p < .001$ (***) based on 2 x 2 chi square.

Table 4.14 provides the frequency and percentage distribution for mind wandering recoded thought by intentionality. The data show that participants reported *practical thoughts* similarly during intentional (58.5%) and unintentional (57.6%) mind wandering episodes. When reported as during intentional mind wandering, *creative or interesting experiences* were indicated one third of the time (32.1%) as compared to 19.8% during unintentional mind wandering. *Concerns or worries* were not often reported for intentional mind wandering (9.4%) but were indicated more than twice as often (22.7%) for unintentional mind wandering episodes. A chi-square test of independence showed there was a significant relationship between thought type and the intentionality of mind wandering, with $\chi^2(2) = 172.488$, $p < .001$. Similarly to parent status findings, the differences were in the creative *or interesting experiences* or *concerns and worries* categories. *Creative or interesting experiences* were reported more often as a feature of intentional than unintentional mind wandering, with $\chi^2(1) = 76.170$ $p < .001$, and *concerns or worries* were indicated more often as a feature of unintentional than intentional mind wandering, with $\chi^2(1) = 137.123$, $p < .001$.

Table 4.14

Frequency and Percentage Distribution for Mind Wandering Episode Recoded Thought Type by Intentionality (N = 4,086)

		Total		Intentional mind wandering		Unintentional mind wandering	
Variable	Categories	*n* = 4,086	%	*n* = 2,422	%	*n* = 1,664	%
	Practical thoughts	2,374	58.1	1,416	58.5	958	57.6
Thought type	Creative or interesting experiences***	1,107	32.1	778	32.1	329	19.8
	Concerns or worries***	605	14.8	228	9.4	377	22.7

Note: Statistically significant differences at $p < .001$ (***) based on 2 x 2 chi square.

Table 4.15 displays participants' reported episodes of thought type with intentionality, parent status, and gender to highlight results that flow from preceding episode data. By looking at these variables in isolation, showing that the relationships between them are highly significant ($p < .001$), and now combining them for this table, thought type episode dynamics are revealed more clearly. Parents and nonparents by gender reported roughly the same *practical thoughts* during their intentional mind wandering episodes as they reported during their unintentional mind wandering episodes. *Creative or interesting experiences* were more often reported by males in both parent statuses, with male parents (38.7%) and male nonparents (36.0 %) during intentional mind wandering episodes. However, during unintentional mind wandering episodes, male nonparents reported fewer *creative or interesting experiences* (22.5%) while episode reports of *concerns and worries* doubled from 14.5% during intentional mind wandering to 29.9% during unintentional mind wandering episodes. This same change in episode thought type was reported by female parents and female nonparents. During unintentional mind wandering episodes, participant episode reports of *creative or interesting experiences* were down by nearly half, while reports of *concerns or worries* doubled from 11.1% to 23.7% for female parents and 14.8% to 25.7% for female nonparents.

The differences between thought type during intentional and unintentional mind wandering episodes suggested that participants thinking other thoughts because "I am open to" was a different kind of mind wandering experience for participants than "just popped up." The distinctions between the episode reports by female and male parents and nonparents was also apparent in *creative or interesting experiences* with males reporting more episodes of this thought type than females. Chi-Square for the relationship between gender, parent status, and types of thought type showed a highly significant relationship across these variables, with χ^2 (6) $= 63.531, p < .001$.

Table 4.15

Frequency and Percentage Distribution for Mind Wandering Episode Recoded Thought Type by Intentionality, Parent Status, and Gender (N = 4,086)

	Thought type***	Female parent (n = 1,507)		Male parent (n = 1,494)		Female nonparent (n = 670)		Male nonparent (n = 387)	
Intentionality	Categories	n	%	n	%	n	%	n	%
Intentional mind wandering	Practical thoughts	535	64.5	578	54.9	185	57.1	118	54.6
	Creative or interesting experiences	202	24.4	408	38.7	91	28.1	77	35.6
	Concerns or worries	92	11.2	67	6.4	48	14.8	21	9.7
Unintentional mind wandering	Practical thoughts	428	63.1	228	51.7	209	60.4	93	46.7
	Creative or interesting experiences	89	13.1	149	33.8	48	13.9	43	21.6
	Concerns or worries	161	23.7	64	14.5	89	25.7	63	31.7

Note: Statistically significant differences at $p < .001$ (***).

Figure 4.5 displays these findings according to parent status modified by gender so we can easily see the difference within conditions and between conditions. First, for all four groups, thought type was different between intentional and unintentional mind wandering episodes. *Concerns or worries* increased for all four groups, from 11% to 24% for female parents, 6% to 15% for male parents, 15% to 26% for female nonparents, and 10% to 32% for male nonparents. The category of thought type that was reduced during unintentional

mind wandering episodes was *creative or interesting experiences.* These data demonstrated that mind wandering intentionality and thought type were related.

Figure 4.5

Thought Type by Parent Status, Gender, and Intentionality
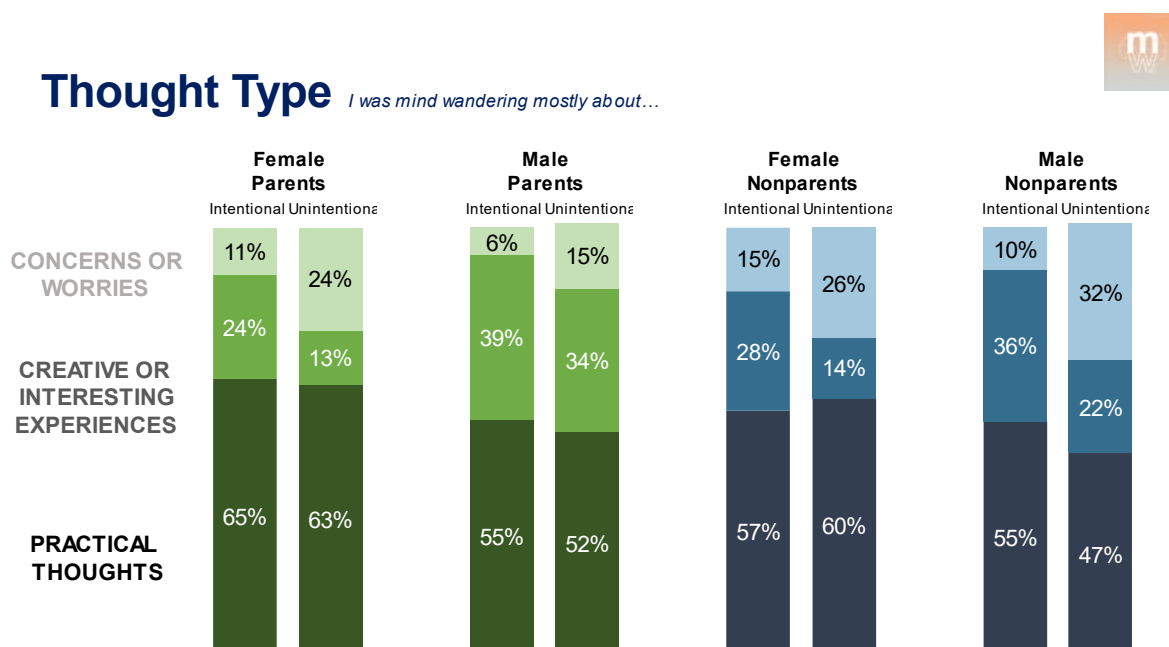
Thought Content

Participants were asked to report thought content that characterized their mind wandering episodes. This was the second part of the mind wandering episode descriptive data. I offered choices that seemed central to working adult daily life. These included *my work*, *my children*, *other family members or friends*, *myself*, and *other things not listed*. Thought content informed the next part of the episode. The expression of this content aimed to situate reported mind wandering experiences in daily life. Table 4.16 shows the data reported by all participants for all mind wandering episodes. We can see that participants reported across the categories fairly evenly with the exception of *other things not listed* (9.2%).

Table 4.16

Thought Content for All Participants and All Mind Wandering Episodes (N = 4,294)

Variable	Categories	*n*	%
	My work	1081	25.2
	My children	996	23.2
Thought content	Other family members or friends	736	17.1
	Myself	1085	25.3
	Other things not listed	396	9.2

Table 4.17 presents mind wandering episode thought content data for parent status. The difficult to classify *other things not listed* was removed because it was not often reported and was difficult to classify. These data were analyzed for possible effects across the parent status and gender groups (see Appendix K: Methodology Notes).

Of the episode content reported by all participants, *my work* (28.1%) and *myself* (28.2%) were evenly reported. When the data were informed by parent status, the difference between parents and nonparents reported episode thought content was most apparent in the reporting of *myself*. Nonparents indicated *myself* as their episode thought content during 48.5% of their episodes as compared to the 21.3% of *myself* reported by parents during their episodes. As expected, a chi-square test of independence showed there was a highly significant relationship between the episode thought content and parent status variables, with $\chi^2(3) = 531.507$, $p < .001$. Since parents had five response options and nonparents only had four possible response options, the data on thought content are not directly comparable for parent status. Looking at the data with respect to the relationship thoughts, Table 4.17 shows that parents reported about half (50.2%) of their episode thought content was about *my children* (32.9%) or *other family members or friends*. Nonparents, while not having children, reported 24.4% of their episode content was about *other family members or friends*.

Table 4.17

Mind Wandering Episode Thought Content for All, Parents, and Nonparents (N = 3,844)

Variable	Categories	Total		Parents (n = 2,866)		Nonparents (n = 978)	
		N	%	n	%	n	%
	My work	1,081	28.1	816	28.5	265	27.1
	My children	942	24.5	942	32.9	0	0
Thought content	Other family members or friends	736	19.1	497	17.3	239	24.4
	Myself	1,085	28.2	611	21.3	474	48.5

Note: Statistically significant differences at $p < .001$ based on 2 x 2 chi square.

Table 4.18 shows the frequency and percentage distribution of mind wandering thought content by gender as reported by participants. Females reported mind wandering episodes about *myself* as their highest category (33.1%), while males reported that more of their mind wandering episodes were about *my work* (32.7%). A chi-square test of independence showed a highly significant relationship between the episode thought content and participant gender variables with $\chi^2(3) = 68.974$, $p < .001$. As well, based on the simple 2 x 2 crosstabs, there was a highly significant relationship between episode reports of *myself* and participant gender with $\chi^2(1) = 54,598$, $p < .001$ and a highly significant relationship between participant gender and episode reports of *my work* with $\chi^2(1) = 36.293$, $p < .001$.

Table 4.18

Frequency and Percentage Distribution for Mind Wandering Episode Thought Content by Gender (N = 3,819)

Variable	Categories	Total		Female (n = 2,011)		Male (n =1,808)	
		n	%	n	%	n	%
	My work***	1,071	28.1	479	23.8	592	32.7
	My children	942	24.7	470	23.4	472	26.1
Thought content	Other family members or friends	734	19.2	396	19.7	338	18.7
	Myself***	1,072	28.1	666	33.1	406	22.5

Note: Statistically significant differences at $p < .001$ (***) based on 2 x 2 chi square.

Table 4.19 shows the frequency and percentage distribution of mind wandering episode thought content by intentionality as reported by participants. Intentional and unintentional mind wandering have significant differences in the reported episode data for all four response categories. Intentional mind wandering episodes about *my work* (31.4%) dropped to 23.2% during unintentional mind wandering. *My children* was reported at 28.5% during intentional mind wandering episodes but dropped to 18.6% during unintentional episodes. What went up during unintentional mind wandering? Well, mind wandering about family and friends went up from 16.8% during intentional to 22.6% during unintentional mind wandering episodes. However, the biggest contrast was in the reporting of episodes having thought content *myself.* *Myself* was reported as 23.3% of intentional mind wandering episodes and increased to 35.6% of unintentional episodes. A chi-square test of independence showed there was a significant relationship between the thought content and intentionality variables, with $\chi^2 (3) = 124.485$, $p < .001$. As well, based on the simple 2 x 2 crosstab, there was a significant relationship between *myself* and intentionality with $\chi^2 (1) = 69.228$, $p < .001$ and a significant relationship between intentionality and *my work* with $\chi^2 (1) = 29.480$, $p < .001$. There was also a significant relationship between intentionality and other family and friends with $\chi^2 (1) = 20.835$, $p < .001$.

Table 4.19

Frequency and Percentage Distribution for Mind Wandering Episode Thought Content by Intentionality (N = 3,844)

Variable	Categories	Total		Intentional mind wandering (n = 2,303)		Unintentional mind wandering (n =1,541)	
		n	%	*n*	%	*n*	%
Thought content	My work***	1,081	28.1	723	31.4	358	23.2
	My children	942	24.5	656	28.5	286	18.6
	Other family members or friends***	736	19.1	387	16.8	349	22.6
	Myself***	1,085	28.2	537	23.3	548	35.6

Note: Statistically significant differences at $p < .001$ (***) based on 2 x 2 chi square.

Table 4.20 brings together the reported episodes of thought content by parent status, gender, and intentionality. After observing these variables and their significant differences, this table shows how participant reports of thought content came together. During intentional mind wandering, both female parents (37.8%) and male parents (34.6%) reported more than a third of their episodes had thought content about *my children*. Male parents reported 36.2% of their intentional mind wandering episodes had content about *my work*. When reporting unintentional mind wandering episodes, parents of both genders indicated that their mind wandering episode content shifted and was more often about *myself*, doubling for male parents from 12.9% to 25.1% and increasing for female parents from 21.5% to 32.6%.

Female and male nonparent mind wandering episode reports were more concentrated on content about *myself* for both intentional mind wandering (female nonparent 51.2%, male nonparent, 44.6%) and unintentional mind wandering (female nonparent 46.2% and male nonparent 51.5%). The differences between thought content during intentional and unintentional mind wandering episodes again suggests that thinking other thoughts because "I am open to" was experienced by respondents as a different kind of mind wandering than "just popped up."

With the empty cell for nonparent thought content about *my children*, as expected, a chi-squared test of independence showed there was a significant relationship between the thought content, parent status, gender, and intentionality variables, with $\chi^2(9) = 307.655$, $p < .001$. The chi-square relationships between the thought content of *my work*, *other family or friends*, and *myself* and parent status, gender, and intentionality were determined and provided in the previous tables for each variable.

Table 4.20

Frequency and Percentage Distribution for Mind Wandering Thought Content by Parent Status, Gender, and Intentionality (N = 3,844)

Intentionality	Thought content / Categories	Female parent (*n* = 1402)		Male parent (*n* = 1464)		Female nonparent (*n* = 609)		Male nonparent (*n* = 369)	
		n	%	*n*	%	*n*	%	*n*	%
Intentional mind wandering	My work	210	26.8	376	36.2	78	26.8	59	31.2
	My children	297	37.8	359	34.6				
	Other family members or friends	109	13.9	169	16.3	64	22.0	45	23.8
	Myself	169	21.5	134	12.9	149	51.2	85	45.0
Unintentional mind wandering	My work	111	18.0	119	27.9	80	25.2	48	26.7
	My children	173	28.0	113	26.5				
	Family members or friends	132	21.4	87	20.4	91	28.6	39	21.7
	Myself	201	32.6	107	25.1	147	46.2	93	51.7

Figure 4.6 displays the findings from the previous tables according to parent status modified by gender so we can easily see the difference within conditions as to mind wandering intentionality. For content, as parents had the added choice of my children, the two groups are not comparable to each other. However, the data is striking when compared within conditions. First, for both female and male parent groups, thought content was different between intentional and unintentional mind wandering episodes. *Myself* increased from 22% to 33% of mind wandering episodes for female parents, 13% to 25% for male parents when mind wandering was unintentional. While *my children* was often reported by parents during intentional mind wandering, this choice was less frequent during unintentional mind wandering for both female and male parents. This was reported for *my work* as well. However, thought content about *other family or friends* increased during unintentional mind wandering, 14% to 21% for female parents and 16% to 20% for male

parents. These data show, at a glance, that mind wandering intentionality and thought content were related for parents.

The thought content for female and male nonparents did not show the same results during intentional and unintentional mind wandering. While the reported content was split somewhat similarly, the changes from intentional and unintentional reporting was inverted. That is, female parents reported more thoughts about *other family or friends* during unintentional mind wandering and less about *myself*. Male nonparents reported episodes with slightly less content about *other family or friends* but more about *myself*.

Figure 4.6

Content by Parent Status, Gender and Intentionality
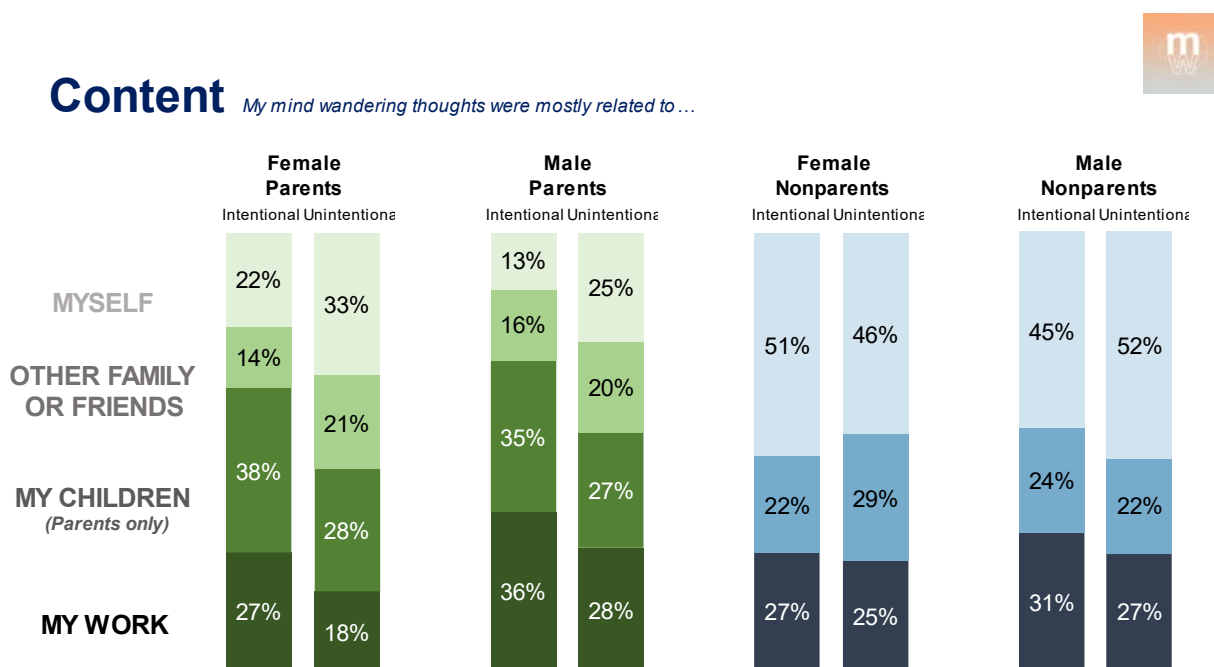
Temporality

Mind wandering episodes have thought type and content that are situated in time. Perhaps a mind wandering thought happened in the past, maybe it never happened at all. In this study, I

looked at the episode data provided by participants who were asked to identify the temporality
that characterized their mind wandering episodes. This was the third part of mind wandering
episode story telling. Temporality choices were *past*, *present*, *future*, and *never happened*.
Participants' episode reports of temporality for wandering experiences in daily life gave evidence
of ways in which mind wandering thoughts may not be about the observed moment but about
something forward or back in time.

As Table 4.21 shows, participants reported mind wandering episodes that concerned
things happening in the *present* (43.4%) or *future* (37.5%). Their reports of episodes happening
in the *past* were fewer (15.6%) and *never happened* was seldom reported.

Table 4.21

Temporality for All Participants and All Mind Wandering Episodes (N = 4,294)

I was mind wandering about things happening mostly in the…			
Variable	Categories	*n*	%
	Past	671	15.6
	Present	1,862	43.4
Temporality	Future	1,609	37.5
	Never happened	152	3.5

The results were informed by parent status as shown in Table 4.22. The difficult to
classify *never happened* was removed as it was seldom reported (see Appendix K: Methodology
Notes). Parents most often indicated episodes of mind wandering about things happening in the
present (46.9%). Nonparents reported more episodes about things happening in the *future*
(47.8%) than parents (35.6%). *Past* was not often reported by either parents (17.5%) or
nonparents (12.7%). These findings add to the observation that participants reported present and
prospectively oriented mind wandering episodes about common things happening today or
sometime later. A chi-square test of independence showed there was a significant relationship

between the temporality and parent status variables, with $\chi^2(2) = 52.472$, $p < .001$. Further,

based on the simple 2x2 crosstab, there was a significant relationship between *present* and parent

status, with $\chi^2(1) = 24.449$, $p < .001$ and a significant relationship between parent status and

future with $\chi^2(1) = 50.752$, $p < .001$. Again, based on the 2x2 crosstab, there was a significant

relationship between *past* and parent status, with $\chi^2(1) = 13.874$, $p < .001$.

Table 4.22

Mind Wandering Episode for All, Parents, and Nonparents (N =4,142)

Variable	Categories	Total		Parents (n = 3,030)		Nonparents (n = 1,112)	
		n	%	n	%	n	%
	Past***	671	16.2	530	17.5	141	12.7
Temporality	Present***	1,862	45.0	1,422	46.9	440	39.6
	Future***	1,609	38.2	1,078	35.6	531	47.8

Note: Statistically significant differences at $p < .001$ (***) based on 2 x 2 chi square.

Table 4.23 displays the findings concerning reported episode temporality and participant

gender. Females reported episodes about things happening mostly in the *present* (43.4%) and

future (44.5%). Males also indicated episodes about things happening mostly in the *present*

(46.9%) and things in the *future* (38.7%). However, males reported more episodes about things

happening in the *past* (21.2%), almost twice as much as females (12.1%). A chi-square test of

independence showed there was a significant relationship between the temporality and gender,

with $\chi^2(2) = 97.140$, $p < .001$. In addition, using the simple 2x2 crosstab, there was a significant

relationship between *present* and gender, with $\chi^2(1) = 6.590$, $p = .01$ and a significant

relationship between gender and *future* with $\chi^2(1) = 68.856$, $p < .001$. Again, based on the 2x2

crosstab, there was a significant relationship between *past* and gender, with $\chi^2(1) = 62.221$, $p <$

.001.

Table 4.23

Frequency and Percentage Distribution for Mind Wandering Temporality by Gender
(N = 4,117)

		Total		Female (n = 2,240)		Male (n = 1,877)	
Variable	Categories	n	%	n	%	n	%
	Past***	669	16.2	271	12.1	398	21.2
Temporality	Present**	1,853	45.0	972	43.4	881	46.9
	Future***	1,595	38.7	997	44.5	598	38.7

Note: Statistically significant differences at $p < .001$ (***) and $p = .01$ (**) based on 2 x 2 chi squar*e*

The next analyses involved the reported temporality episode data according to reported mind wandering intentionality. Table 4.24 displays these data. Participants reported that their intentional (45.4%) and unintentional (44.4%) mind wandering episodes were mostly about things happening in the present. Participants indicated that things happening in the future during intentional mind wandering was a frequent 36.2% and things happening in the past was 18.5%. During unintentional mind wandering episodes, participants reported an increase in the *future* (42.7%) and decrease in the *past* (12.9%). A chi-square test of independence showed there was a significant relationship between the temporality and intentionality variables, with $\chi^2 (2) = 30.298$, $p < .001$. Using the simple 2x2 crosstab, there was a significant relationship between *future* and intentionality with $\chi^2 (1) = 17.999$ $p < .001$. As well, based on the 2x2 crosstab, there was a significant relationship between *past* and intentionality, with $\chi^2 (1) = 22.765$, $p < .001$.

Table 4.24

Frequency and Percentage Distribution for Mind Wandering Temporality by Intentionality
(N = 4,142)

Variable	Categories	Total		Intentional mind wandering		Unintentional mind wandering	
		N	%	*n*	%	*n*	%
	Past***	671	16.2	450	18.5	221	12.9
Temporality	Present	1,862	45.0	1,104	45.4	758	44.4
	Future***	1,609	38.2	880	36.2	729	42.7

Note: Statistically significant differences at $p < .001$ (***) based on 2 x 2 chi square.

Table 4.25 brings together the temporality episode data concerning parent status, intentionality, and gender. Here we see that female and male parents reported episodes with similarly high percentage of *present*-oriented mind wandering during both intentional and unintentional mind wandering. The data showed that female parents reported more episodes with a *future* focus (39.2%) than male parents (26.5%) during intentional mind wandering episodes. During mind wandering that "popped up," female parents reported even more future-oriented episodes (45.2%), and male parents also increased their mind wandering about the future (34.9%). Thus, parents of both genders reported that when episodes of mind wandering "popped up," these were more *future*-focused than when those episodes were reported as "open to."

Female nonparents reported episodes that were *future* focused more than any other group (52.7%) during intentional mind wandering. This temporality persisted in episodes reported during unintentional mind wandering (47.8%). Meanwhile, male nonparents reported minor change in temporality between their intentional and unintentional mind wandering episodes.

Overall, parents did not report mind wandering episodes set in the *past*. Their reports of *past* drops during unintentional mind wandering episodes. Female parents reported episodes that

were *past*-oriented 16.2% intentional mind wandering, but this dropped to 9.7% for unintentional

mind wandering episode reports.

A chi-square test of independence showed there was a significant relationship between

the thought temporality and intentionality, gender, and parent status variables, with χ^2 (6) =

110.751, *p* < .001. The chi-square relationships between temporality of *past* and *future* and

parent status, gender, and intentionality were determined for and provided in the previous tables

for this variable. These were found to have statistically significant differences at *p* < .001 (***)

based on 2 x 2 chi square.

Table 4.25

Frequency and Percentage Distribution for Mind Wandering Temporality by Parent Status,
Gender, and Intentionality, (N = 4,142)

	Temporality	Female parent (*n* = 1,542)		Male parent (*n* = 1,488)		Female nonparent (*n* = 698)		Male nonparent (*n* = 414)	
Intentionality	Categories	*n*	%	*n*	%	*n*	%	*n*	%
Intentional mind wandering	Past	136	16.2	250	23.9	25	7.6	39	18.5
	Present	375	44.6	520	49.7	130	39.6	79	36.6
	Future	330	39.2	277	26.5	173	52.7	92	44.9
Unintentional mind wandering	Past	68	9.7	76	17.2	42	11.4	35	18.5
	Present	316	45.1	211	47.8	151	40.8	80	40.8
	Future	317	45.2	154	34.9	177	47.8	81	40.8

Figure 4.7 provides the temporality data from previous tables according to parent

status modified by gender so we can easily see the difference within conditions as to mind

wandering intentionality. For temporality, parents and nonparents have contrasting patterns.

That is, parents increased their future temporality during reported unintentional mind

wandering episodes. While the percentage of their present-oriented episode did not much

change, their reports of episodes set in the past were fewer for unintentional mind wandering episodes. Nonparents reported most episodes with future temporality. However, we see unintentional mind wandering was reported as less future oriented while past thoughts increased for female nonparents. While present and future temporality may have some fuzziness about them, e.g., is it future if it is happening in an hour or a day or next year, the reports of mind wandering set in the past, while the least frequent of the three temporalities, showed change, particularly when viewing the changes for male parents where episodes with thoughts in the past were reported 24% during intentional episodes, that is, male parents had things that had already happened when they were open to mind wandering.

Figure 4.7

Temporality by Parent Status, Gender, and Intentionality
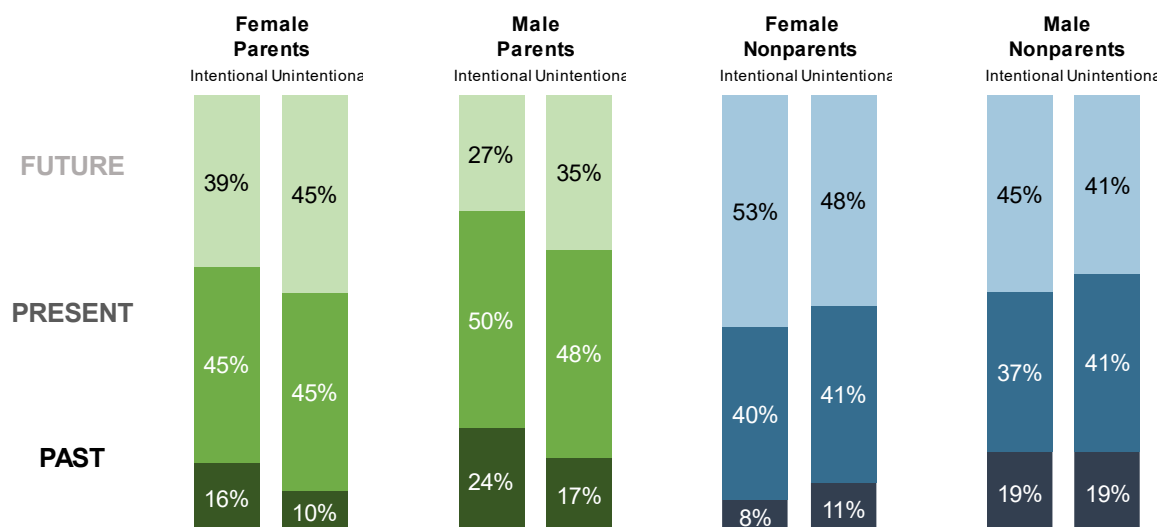
Context

After participants reported mind wandering episode data as to frequency, intentionality, thought type, content, and temporality, they answered a question, "when responding to this notification, I was doing things mostly related to …." This question was asked to better understand the situation in which participants' mind wandering happened, particularly for the purpose of comparing episode content and context as asked in RQ4. Experience sampling notifications were randomly sent to participants between 9 a.m. and 8 p.m., during work, after work, or on weekends and afternoons and evenings without work. While both participants who reported mind wandering and those who reported not mind wandering answered this question as to their context at the time of the notification, the data in these tables concerns only those who reported mind wandering.

The choices for context were the same as those for thought content, *my work*, *my children*, *my family members or friends*, *myself*, and *other things not listed*. The tables in this section present the participants' episode reports as to all, parent status, intentionality, and gender with a final table bringing the pieces together. Each table addresses a part of the final table of temporality data. In Table 4.26, context is presented for all episode level data.

During the study, participants reported mind wandering episodes while in these contexts. I note that context by itself does not characterize mind wandering since it is a fact of location and activity, not about the episode itself. That said, it is important to look at where participants reported mind wandering as I use this data in RQ4 to investigate the relationship between mind wandering episode thought content and episode context.

Table 4.26

Context for All Participants and All Mind Wandering Episodes (N = 4,294)

	When responding to this notification, I was doing things mostly related to …		
Variable	Categories	*n*	*%*
	My work	1,222	28.5
	My children	1,003	23.4
Context	Other family members or friends	505	11.8
	Myself	1,324	30.8
	Other things not listed	240	5.6

Table 4.27 presents episode context data reported by all, parents, and nonparents. As with the thought content data, parents had five response options and nonparents only four possible response options as they did not have *my children* as a response. Thus, the data on context are not directly comparable for parent status. Further, this table does not include the small percentage of episodes that were reported as having context related to *other things not listed*. The difficult to classify *other things not listed* was removed after being analyzed for possible effects. The cell size for analyses was problematic as it was seldom reported across the parent status and gender groups (see Appendix K: Methodology Notes).

The descriptive episode data in Table 4.27 indicates that about one third of the episodes reported by parents or nonparents were mostly related to *my work*, with 31.0% for parents and 29.2% for nonparents. This makes sense as the experience sampling notifications were randomly timed between 9 am and 6 pm, often coinciding with work hours. For parents, another third of their context reports indicated they were doing things mostly related to *my children* (31.9%) when responding. Neither parents or nonparents reported context that was often related to *other family members or friends*. Nonparents reported more than half of the time when they answered the notification, they were doing something related to *myself* (55.3%). A chi-square test of independence showed there was a significant relationship between the context and parent status

variables, with χ^2 (3) = 547.299, $p < .001$. Additionally, based on the simple 2 x 2 crosstab, there

was a significant relationship between *my work* context and parent status, χ^2 (1) = 3.685, $p = .05$,

a significant relationship between *myself* context and parent status, with χ^2 (1) = 265.278, $p <$

.001, and *other family members or friends* and parent status, with χ^2 (1) = 46.980, $p < .001$.

Table 4.27

Mind Wandering Episode Context for All, Parents, and Nonparents (N = 3,997)

		Total		Parents (*n* = 2,963)		Nonparents (*n* = 1,034)	
Variable	Categories	*n*	%	*n*	%	*n*	%
Context	My work**	1,222	30.6	920	31.0	302	29.2
	My children	946	23.7	946	31.9		
	Other family members or friends***	505	12.6	345	11.6	160	15.5
	Myself***	1,324	33.1	752	25.4	572	55.3

Note: Statistically significant differences at $p < .001$ (***) and $p = .05$ (**) based on 2 x 2 chi square.

Table 4.28 presents episode context data reported by female and male participants.

Female participants often reported the context of their episodes as *myself* (39.4%) while males

most often reported *my work* as their episode context (35.6%). A chi-square test of independence

showed there was a significant relationship between context and gender, with χ^2 (3) = 94.478, p

$< .001$. Further, based on the simple 2 x 2 crosstab, there was a significant relationship between

my work context and gender, χ^2 (1) = 40.314, $p < .001$, and *myself* context and gender, with χ^2

(1) = 92.086., $p < .001$.

Table 4.28

Frequency and Percentage Distribution for Mind Wandering Episode Context by Gender (N = 3,972)

		Total		Female (n = 2,127)		Male (n = 1,845)	
Variable	Categories	n	%	n	%	n	%
	My work***	1,210	30.5	554	26.0	656	35.6
Context	My children	946	23.8	476	22.4	470	25.5
	Other family members or friends	502	12.6	254	11.9	248	13.4
	Myself***	1,314	33.1	843	39.6	471	25.5

Note: Statistically significant differences at $p < .001$ (***) based on 2 x 2 chi square

Table 4.29 provides the reported contexts for episodes of intentional and unintentional mind wandering. About one third of intentional (32.6%) and unintentional (27.7%) mind wandering episodes were reported as context about doing things mostly related to *my work*. Participants reported being in the context of *my children* when they reported intentionally mind wandering episodes (27.8%) and less often *my children* during unintentional mind wandering episodes (17.8%). Context of *myself* was reported in unintentional mind wandering episodes (40.0%) more than during intentional mind wandering episodes (28.3%). A chi-square test of independence showed there was a significant relationship between context and intentionality, with $\chi^2(3) = 96.625$, $p < .001$. Using simple 2 x 2 crosstabs, there were significant relationships between *my work* context and intentionality, with $\chi^2(1) = 9.182$, $p < .002$, *myself* context and intentionality, with $\chi^2(1) = 62.263$, $p < .001$, *my children* context and intentionality, with $\chi^2(1) = 65.800$, $p < .001$, and *other family members or friends,* with $\chi^2(1) = 22.060$, $p < .001$.

Table 4.29

Frequency and Percentage Distribution for Mind Wandering Episode Context by Intentionality (N = 3,997)

Variable	Categories	Total		Intentional mind wandering		Unintentional mind wandering	
		n	%	*n*	%	*n*	%
Context	My work**	1,222	30.6	766	32.6	456	27.7
	My children***	946	23.7	654	27.8	292	17.8
	Other family members or friends***	505	12.6	266	11.3	239	14.5
	Myself***	1,324	33.1	666	28.3	658	40.0

Note: Statistically significant differences at *p* < .001 (***) and at *p* < .002 (**) based on 2 x 2 chi square.

Table 4.30 pulls together the context episode data concerning parent status, gender, and intentionality. Here we see that participants reported *my work* as a common context for episodes with a higher percentage of *my work* context mind wandering during intentional mind wandering for male parents (39.4%). Both female and male parents reported *my children* context as higher in intentional mind wandering than in unintentional.

The episode context data showed that female nonparents reported most of their mind wandering episodes, both intentional (61.1%) and unintentional (53.2%), happened in the context of *myself.* As expected with the empty cells for nonparent *my children*, a chi-square test of independence showed there was a significant relationship between context and parent status, intentionality, and gender, with χ^2 (9) = 438.006, *p* < .001. The chi-square relationships between context *variables* and parent status, gender, and intentionality were determined and provided in the previous tables for this variable.

Male parents reported more of their intentional mind wandering episodes related to work (39.4%) than the other three conditions. What we know about these participants is that they

reported their work location as over 90% away from home. As five of the six random

notifications were timed between 9 a.m. and 6 p.m., it was common for these participants to be

doing things related to work. We also know that 72% of these male parents reported that they

live in cities and 92% have a college or higher education level.

Table 4.30

Frequency and Percentage Distribution for Mind Wandering Episode Context by Parent Status, Intentionality, and Gender (N = 3,997)

Context		Female parent (n = 1,481)		Male parent (n = 1,482)		Female nonparent (n = 646)		Male nonparent (n = 388)	
Intentionality	Categories	*n*	%	*n*	%	*n*	%	*n*	%
Intentional mind wandering	My work	221	27.3	410	39.4	78	25.5	57	29.1
	My children	297	36.7	357	34.3	0	0	0	0
	Family members or friends	76	9.4	114	11.0	41	13.4	35	17.9
	Myself	215	26.6	160	15.4	187	61.1	104	53.1
Unintentional mind wandering	My work	146	21.7	143	32.4	109	32.1	58	30.2
	My children	179	26.6	113	25.6	0	0	0	0
	Family members or friends	87	12.9	68	15.4	50	14.7	34	17.7
	Myself	260	38.7	117	26.5	181	53.2	100	52.1

These findings are depicted in Figure 4.8 and demonstrate that parents often reported

episodes while doing something related to their children or other family members. As expected,

nonparents often reported episode context as *myself*. What this illustration emphasizes is that

mind wandering for nonparents is often reported as occurring when the participant was doing

something related to her or himself.

Figure 4.8

Context by Parent Status, Gender, and Intentionality

Context *When responding to this notification, I was doing things mostly related to…*

	Female Parents		**Male Parents**		**Female Nonparents**		**Male Nonparents**	
	Intentional	Unintentional	Intentional	Unintentional	Intentional	Unintentional	Intentional	Unintentional
MYSELF	27%	39%	15%	27%				
OTHER FAMILY MEMBERS	9%	13%	11%	15%	61%	53%	53%	52%
MY CHILDREN (Parents only)	37%	27%	34%	26%		15%	18%	18%
MY WORK	27%	22%	39%	32%	13% 26%	32%	29%	30%
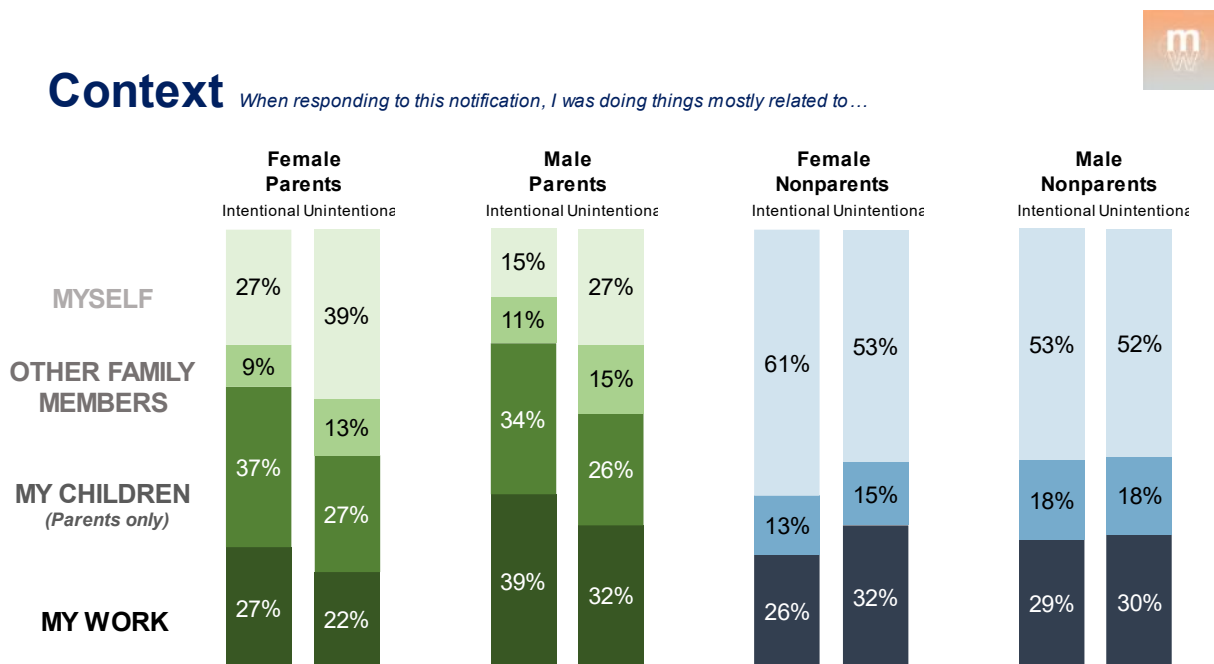
Context Demand

After participants reported mind wandering episode data as to their context, the next question concerned context demand. This item sought to better understand the participant's sense as to their engagement with what they were doing at the time of the notification. Study notifications were sent to participants at six random times between 9 a.m. and 8 p.m. Context demand varied across this time. In viewing these data, it is important to recognize that context and task were not contrived or standardized in this study as in a lab-based studies. In daily life, context demand could range from waiting on tables in a crowded restaurant, meeting a work deadline, helping a screaming child get up after falling down. The constancy across the episode reports was that participants perceived for themselves what their context demands were.

This mind wandering episode survey question asked participants to give a sense of context demand with four choices: 1 = *not demanding*, 2 = *somewhat demanding*, 3 = *demanding*, and *4 = very demanding.* These four choices were analyzed as a scale variable. I wanted an "intensity read," in keeping with an exploratory study, to gauge if reported mind wandering episodes were happening with a lot or a little going on and how that sense of demand coupled with episodes.

Table 4.31 shows these episode level data. The overall mean score was 2.38. That result could be understood as, overall, episodes were reported as above somewhat demanding, but less than fully demanding, perhaps understood as "actively engaged" in tasks at the time of the notification. However, as we take this result into its parts, I note that *t*-test results showed a statistically significant difference for context demand for parents at 2.53 and nonparents at 1.97, with t (4,292) = 15.626, $p < .001$. That meant that parents reported that their mind wandering episodes occurred during a significantly higher demand level than episodes reported by nonparents.

T-test results also showed a statistically significant difference for context demand by gender, with females perceiving and reporting a lower demand level (M = 2.0994) than the context demand for episodes reported by males (M = 2.71), with t (4,264) = −19.514, $p < .001$. Male participants reported a significantly higher context demand level than female participants. I noted that males also reported more of mind wandering episodes occurring in a work context than females. Lastly, *t*-test results indicated a statistically significant difference for context demand for intentionality, with a mean score for intentional at 2.53 and for unintentional at 2.17, with t (4,292) = 11.055, $p < .001$. This result meant that all participants reported significantly

higher context demand during their intentional mind wandering episodes than during their unintentional mind wandering episodes.

Table 4.31

Mean Scores for Context Demand for All, Parent Status, Gender, and Intentionality for Mind Wandering Episodes (N = 4,294)

Context demand	Category	Mean score
Total		2.38
Parent status***	Parent	2.53
	Nonparent	1.97
Gender***	Female	2.10
	Male	2.71
Intentionality***	Intentional	2.53
	Unintentional	2.17

Note: Statistically significant differences at $p < .001$ (***)

I investigated parent status context demand episode data as to gender and intentionality variables. Table 4.32 provides the *t*-test results that show a statistically significant difference for context demand for the parent + gender variable with female parents having a mean score of 2.22 and male parents at 2.85, with t $(3,112) = -17.435$, $p < .001$. *T*-test results showed statistically significant differences for context demand for parent + intentionality variable with parents reporting intentional mind wandering episodes having a mean score of 2.33 and parents reporting unintentional mind wandering episodes 2.71, with t $(3,112) = -10.092$, $p < .001$.

What these results promote is the importance of looking at the parts and recognizing how these combine. For yet another variable, we see that gender is an important part for interpreting results. Female parents more often reported that their context demand was lower ($M = 2.22$) than males ($M = 2.85$). As well, we can see that parents reported more higher context demand ($M =$

2.68) during mind wandering episodes they identified as intentional. They reported lower context

demand for mind wandering episodes they identified as unintentional ($M = 2.29$).

Table 4.32

Mean Scores for Context Demand for Parent + Gender and Parent + Intentionality for Mind Wandering Episodes (N = 3,114)

Context demand	Category	Mean score
Parent + Gender***	Female parents	2.22
	Male parents	2.85
Parent + Intentionality***	Parent intentionally mind wandering	2.68
	Parent unintentionally mind wandering	2.29

Note: Statistically significant differences at *p* < .001 (***)

In Table 4.33, I present a cross tabulation of these findings to give the contextual

demands. The significance was already established. Male parents indicated a high percentage of

their mind wandering episodes were intentional, roughly 70%. Further, of these, as highlighted

on Table 4.33, 71.7% of episodes were reported as being *demanding* or *very demanding*.

Meanwhile, male nonparents were split on the frequency of their episode context demand when

in intentional and unintentional. They also reported lower (27.3%) *demanding* episodes with just

15% of episodes characterized as *very demanding* being intentional, and only 6.1% of their

unintentional mind wandering episodes being identified as *very demanding*. There was contrast

between female parents and nonparents as well. Female nonparents identified over half (50.3%,

as highlighted in Table 4.33) of their intentional mind wandering occurring during *not*

demanding situations. They continued to report low demand during their unintentional mind

wandering with just 5.9% of their episodes reported as very demanding. "Pop up" mind

wandering, was reported more often when lower demand was also reported for the episode.

Table 4.33

Context Demand for Parent Status, Gender, and Intentionality for Mind Wandering Episodes (N = 3,114)

	Demand	Female parent (*n* = 1,592)		Male parent (*n* = 1,522)		Female nonparent (*n* = 741)		Male nonparent (*n* = 439)	
Intentionality	Categories	*n*	%	*n*	%	*n*	%	*n*	%
Intentional mind wandering	Very demanding	162	18.8	341	32.0	27	7.7	34	15.0
	Demanding	217	25.2	422	39.7	64	18.2	62	27.3
	Pretty demanding	232	26.9	207	19.5	84	23.9	75	33.0
	Not demanding	251	29.1	94	8.8	177	50.3	56	24.7
	Total episodes	862		1,064		352		227	
Unintentional mind wandering	Very demanding	75	10.3	97	21.2	23	5.9	13	6.1
	Demanding	165	22.6	162	35.4	68	17.5	61	28.8
	Pretty demanding	234	32.1	126	27.5	126	32.4	64	30.2
	Not demanding	256	35.1	73	15.9	172	44.2	74	34.9
	Total episodes	730		458		389		212	

Figure 4.9 provides a summary chart of context demand mean scores. Of these findings,

it was unexpected that intentional mind wandering episodes were reported to have higher context

demand (2.53) than unintentional mind wandering episodes (2.17). Parents reported intentionally

mind wandering during higher context demand (2.68) and unintentional mind wandering

episodes during lower context demand (2.29). This finding may have something to do with the

demand level that parents experience both at work and at home. Context demand is not

synonymous with complexity of task, as has been noted previously. Further research will be

needed to better understand this study's findings.

Figure 4.9

Context Demand by Parent Status, Gender, and Intentionality

Context Demand

When responding to this notification, I was doing tasks I consider…
1) not demanding, 2) somewhat demanding, 3) demanding, 4) very demanding.

Significantly Higher Demand Groups *Mean Score*	Lower Demand Groups *Mean Score*
Parents (2.53)	Nonparents (1.97)
Males (2.71)	Females (2.10)
Intentional (2.53)	Unintentional (2.17)
Male Parents (2.85)	Female Parents (2.22)
Parents Intentionally Mind Wandering (2.68)	Parents Unintentionally Mind Wandering (2.29)

Emotion

The last of the mind wandering episode survey questions asked the respondent for a general feeling at the time of the notification. For those who were mind wandering at the time of the notification, this question asked about their emotion at the time of the mind wandering episode. I was looking to understand if a particular level of emotion at the time of the notification related to mind wandering, particularly was this reported differently for intentional mind wandering than unintentional mind wandering episodes. While context demand asked participants to give an "intensity reading" for the situation the participant was in at the time of the notification, the emotion question was meant to get a basic "emotional reading" that the participant was experiencing at the time of the notification. This item offered four choices, 1 = *not so good*, 2 = *pretty good*, 3 = *very good*, and 4 = *great*. These choices were converted into

a scale variable with "4" corresponding with feeling great and "1" feeling not so good. In keeping with an exploratory study, I wanted to learn more about whether a respondent reported feeling energy or energy depletion at the time of the notification.

Table 4.34 shows this episode level data for this survey question. *T*-test results showed a statistically significant difference for emotion for parents ($M = 2.74$) and nonparents ($M = 2.37$), with $t (4,292) = 11.995$, $p < .001$. That meant that parents reported mind wandering episodes having a significantly higher good feelings level than nonparents reports for mind wandering episodes. *T*-test results also showed a statistically significant difference for emotion for gender with females ($M = 2.47$) and males ($M = 2.85$), with $t (4,264) = -13.796$, $p < .001$. Male participants reported a significantly higher good feelings level than female participants. Lastly, *t*-test results indicated a statistically significant difference for good feelings for intentionality with intentional ($M = 2.80$) and unintentional ($M = 2.42$), with $t (4,292) = 13.497$, $p < .001$. This result meant that all participants reported a significantly higher good feelings level during their intentional mind wandering episodes than during their unintentional mind wandering episodes.

T-test results also showed a statistically significant difference for emotion for gender with females ($M = 2.47$) and males ($M = 2.85$), with $t (4,264) = -13.796$, $p < .001$. Male participants reported a significantly higher good feelings level than female participants at the time of the notification. Lastly, *t*-test results indicated a statistically significant difference for good feelings for intentionality with intentional ($M = 2.80$) and unintentional ($M = 2.42$), with $t (4,292) = 13.497$, $p < .001$. This result meant that all participants reported a significantly higher good feelings level during their intentional mind wandering episodes than during their unintentional mind wandering episodes.

Table 4.34

Mean Scores for Emotion for All, Parent Status, Gender, and Intentionality for Mind Wandering Episodes (N = 4,294)

Variable	Category	Mean score
Total		2.64
Parent status***	Parent	2.74
	Nonparent	2.37
Gender***	Female	2.47
	Male	2.85
Intentionality***	Intentional mind wandering	2.80
	Unintentional mind wandering	2.42

Note: Statistically significant differences at $p < .001$ (***)

Since parents had reported mind wandering episodes having a significantly more energized feelings level than nonparents, I took a closer look at parent status episode data with regards to gender and intentionality to see where the highs and lows were reported for these episode data. In Table 4.35, I provide the *t*-test results for these analyses. The results show a statistically significant difference for reported episode emotion for the parent + gender variable with female parents having a mean score of 2.56 and male parents reporting a mean score of 2.93, with $t\,(3,112) = -11.332$, $p < .001$. *T*-test results showed a statistically significant difference for emotion during mind wandering episodes for the parent + intentionality variable with parents reporting a more positive emotion ($M = 2.88$) during intentional mind wandering episodes than during unintentional ($M = 2.52$), with $t\,(3,112) = 10.696$, $p < .001$.

These findings inform the parts of the descriptive variable "emotion" to better understand what looked monolithic at the start with the overall report. Female parents more often reported that their emotions during their episodes were in the *pretty good* range ($M = 2.56$) than male parents who more often reported feeling *very good* to *great* in their episodes ($M = 2.93$). As well, we can see that parents reported that more of their intentionally mind wandering episodes

occurred during more positive emotional states ($M = 2.88$). Parents' reports of unintentional mind wandering episodes were still reported to be during pretty good emotion states ($M = 2.52$). Given thousands of mind wandering episodes, this result is revisited in Chapter V. This study is not finding mind wandering occurring during low emotional states. In fact, the results lean toward respondents feeling pretty good!

Table 4.35

Mean Scores for Mind Wandering Episode Emotion for Parent + Gender and Parent + Intentionality (N = 4,294)

Emotion	Category	Mean score
Parent + Gender***	Female Parents	2.56
	Male Parents	2.93
Parent + Intentionality***	Parent Intentionally Mind Wandering	2.88
	Parent Unintentionally Mind Wandering	2.52

Note: Statistically significant differences at $p < .001$ (***).

Figure 4.10 offers a summary chart of emotion mean scores. Of these findings, parents reported a higher level of emotion (2.74) than nonparents (2.37), with male parents highest (2.93) during mind wandering. Significantly, intentionality mattered in these emotion data. Parents reported intentionally mind wandering with higher levels of emotion (2.88) and unintentional mind wandering episodes with lower emotion (2.52). Further research will be needed to better understand this study's findings concerning emotion at the time of the notification, but the emotional reading data does indicate parents and particularly male parents were feeling more energy than energy depletion at the time of the notification when they reported mind wandering. In sum, all participants reported feeling pretty good at the time of the notification when they were mind wandering.

Figure 4.10

Emotion by Parent Status, Gender, and Intentionality

Emotion

When responding to this notification, I was feeling mostly…
1) not so good, 2) pretty good, 3) very good, 4) great.

Significantly Higher Emotion Groups *Mean Score*	Lower Emotion Groups *Mean Score*
Parents (2.74)	Nonparents (2.37)
Males (2.85)	Females (2.47)
Intentional (2.80)	Unintentional (2.42)
Male Parents (2.93)	Female Parents (2.56)
Parents Intentionally Mind Wandering (2.88)	Parents Unintentionally Mind Wandering (2.52)

RQ4: What Can We Learn by Comparing Descriptive Characteristics?

By addressing RQ2 and RQ3, I have shared this study's mind wandering episodes frequencies as well as the descriptive characteristics of thought type, content, temporality, context, demand, and emotion for those episodes. These data have been compared by parent status, gender, and intentionality with statistically significant findings. The data has shown that intentional and unintentional mind wandering are not the same experience, varying by thought type, content and temporality. We also see that parents and nonparents mind wandering episodes were reported as different, followed by gender in which we see that male parents have distinguishing features of mind wandering episode data.

RQ4 asks three questions to take these analyses further: The first two concern what we can learn about working adult mind wandering episodes by linking within mind wandering

episode characteristics. The third are what we learn by comparing the content demand and emotion reported for mind wandering episodes with the context demand and emotion reported for non-mind wandering at the time of notification.

Question 1: Content and Context

Question 1 concerns the content we think about and what are we doing when we think about it. How do thought content and context relate to each other within mind wandering episodes?

I analyzed the relationship between the mind wandering episode content and context using cross tabs and concatenation. There were 16 different combinations of content and context. As reported in Table 4.36, in each category, thought content is the same as context more than any other combinations. I highlighted the same content and context combinations for each category. These total 3774, or 56.3% of the episodes. A chi-square test of independence showed there was a significant relationship between content and context, with $\chi^2 (9) = 1878.770$, $p < .001$.

Table 4.36

Participant Episode Reports of Mind Wandering Content and Context Within Episode (N = 3,774)

Variable	Categories	Context							
		My work		My children		Other family/friends		Myself	
		n	%	n	%	n	%	n	%
	My work	630	54.9	179	18.5	76	16.1	169	27.9
Content	My children	204	17.8	557	57.7	101	21.4	121	10.2
	family/friends	138	12.0	151	15.6	228	48.2	187	15.8
	Myself	175	15.3	82	8.5	68	14.4	708	59.7

While we saw that 56.3% of mind wandering episodes were reported with content and context as the same, that still left 43.7% of episodes in which the content and the context were not the same. In terms of "out of context" thoughts, when participants were in the work context,

their most likely other thoughts were about their children; when with their children, their other

thoughts were about work, at about the same rate, 17.8% and 18.5%, respectively. When they

were doing something for themselves, their highest percent of other thoughts were about their

work (27.9%). In other words, working adults reported not only mind wandering about work for

more than half of their mind wandering episodes, they also reported the largest percentage of

their "out of context" thoughts about work! Figure 4.11 displays same content and context data

(green) so we see can easily see these while also showing, using yellow and red, the

combinations that do not have the same content and context.

Figure 4.11

Within Episode Content + Context

Within Episode: Content + Context

Column percentages = % of mind wandering episodes within context that have the same/different content.
Same: "I was doing things related to my children while mind wandering about my children"
Different: "I was doing something related to my work while mind wandering about my friends."

Out of 3774 EPISODES

56.3% SAME content & context
43.7% DIFFERENT content & context

Context (I was doing things mostly related to…)

	My work	My children	Other family/friends	Myself
My work	54.9	18.5	16.1	27.9
My children	17.8	57.7	21.4	10.2
Other family/friends	12.0	15.6	48.2	15.8
Myself	15.3	8.5	14.4	59.7

Content (My thoughts mostly related to...)

Question 2: Thought Type, Content, and Temporality

My second question in this RQ4 section was, what can we learn about participants' mind

wandering episodes by linking within episode descriptive characteristics of thought type,

content, and temporality? By doing this, we can appreciate the whole mind wandering

experience, not just a piece of it. These descriptive characteristics analyses reveal parts of mind

wandering episode stories. Let's remember why this is meaningful. A thought type needs

content. Life is lived in a past, present, future orientation. Without putting these together, mind

wandering is a puddle of pieces.

Table 4.37 provides the episode data stories generated by bringing together these three

characterizing variables. I have used shading to make this table easier to interpret. The table is

read across, e.g., "I was mind wandering practical thoughts about my children in the present."

Using this approach, I have put parts together that can be read as episode stories and then one

can see how often that story was reported. For example, "I was mind wandering creative or

interesting experiences about my work in the past" comprised 20.9% of the mind wandering

episodes with this thought type and content set in the past.

There were several ways to cross tabulate and present this data. I chose this format

because it fit the "left to right" data story I have been building. I organized this table in this

sequence as well because there are several questions related to temporality in the literature. This

table makes evident that mind wandering episodes set in the *past* were not common. Only 16.0%

of the episode data presented in this table were reported as happening in the past. This shows up

particularly in concerns or worries episodes as very few of these were in the past, just 66

episodes or 12.5% of the concerns or worries data.

With this "row story" approach, one can move around this table to find what is significant

to answer about the episodes as interesting and/or relevant to the literature. Working adults most

often reported episodes with *practical thoughts* set in the present with content that was

personally motivated about people and things they cared about. Practical thoughts were least

often about *myself* set in the past. The parents in this study who reported episode content about their children, most often reported *practical thoughts* and very seldom reported *concerns or worries* about their children. Chi-square tests of independence showed there were significant differences for *practical thoughts* with $\chi^2 (6) = 54.089$, $p < .001$, *creative or interesting experiences* with $\chi^2 (6) = 16.468$, $p = .01$. Small cell size for *concerns or worries* in the past affected chi-square findings of significance. The total chi-square significance was $\chi^2 (6) = 56.987$, $p < .001$.

Table 4.37

Frequency of Combinations of Mind Wandering Episodes with Certain Thought Type, Content, and Temporality (N=3,657)

Thought type	Content	Past		Present		Future		Total episodes in thought type	
		n	%	*n*	%	*n*	%	*n*	%
Practical thoughts***	My work	101	15.4	319	48.6	236	36.0	656	100.0
	My children	123	20.5	250	41.7	227	37.8	600	100.0
	Other family/friends	51	15.0	136	40.0	153	45.0	340	100.0
	Myself	44	8.1	222	41.1	274	50.7	540	100.0
Episodes in Past, Present, Future		319	14.9	927	43.4	890	41.7	2136	100.0
Creative or interesting experiences**	My work	67	20.9	156	48.6	98	30.5	321	100.0
	My children	63	25.4	115	46.4	70	28.2	248	100.0
	Other family/friends	39	18.8	108	52.2	60	29.0	207	100.0
	Myself	32	14.7	95	43.8	90	41.5	217	100.0
Episodes in Past, Present, Future		201	20.2	474	47.7	318	32.0	993	100.0
Concerns or worries	My work	15	18.3	35	42.7	32	39.0	82	100.0
	My children	7	8.5	36	43.9	39	47.6	82	100.0
	Other family/friends	13	10.8	64	53.3	43	35.8	120	100.0
	Myself	31	12.7	114	53.3	99	46.7	249	100.0
Episodes in Past, Present, Future		66	12.5	249	47.2	213	40.3	528	100.0
Total episodes in Past, Present, Future		586	16.0	1,650	45.1	1,421	38.9	3657	100.0

Note: Statistically significant differences at *p* < .001 (***) and *p* = .01(**)

Putting these parts into story form, a participant reporting an episode may have been saying, "I was intentionally mind wandering day-to-day thoughts about myself in the future." or, "mind wandering thoughts popped up about creative things I want to do in the present." In my view as an educational psychology researcher, poet, and artist, linking within episode parts revealed a mind wandering as a form of self-talk. Figure 4.12 shows an example of mind wandering episode with thought type, content, temporality, context, context demand, and emotion in one bubble.

Figure 4.12

Mind Wandering Episode as Self-Talk

Note: Mind Wandering Episode as Self-Talk. Copyright 2022 by Paula C. Lowe

Figure 4.13 is provided as a quick way to check out the episode stories. Pick a thought type, content, and temporality, e.g., creative or interesting experiences related to my children in the present. The reds and oranges signal the least frequent temporalities. Green indicates the most frequent. The light shades show the quite frequent episodes.

Figure 4.13

Within Episode: Thought Type + Content + Temporality

Within Episode: Thought Type + Content + Temporality

Row Percentages = % of thought type + content reported as happening in past, present, or future.
Example: I was mind wandering practical thoughts about my work in the future. N = 3657

THOUGHT TYPE	CONTENT	TEMPORALITY		
		Past	Present	Future
Practical Thoughts (58.4% of all episodes)	My work	15.4	48.6	36.0
	My children	20.5	41.7	37.8
	Other family/friends	15.0	40.0	45.0
	Myself	8.1	41.1	50.7
Creative or Interesting Experiences (27% of all episodes)	My work	20.9	48.6	30.5
	My children	25.4	46.4	28.2
	Other family/friends	18.8	52.2	29.0
	Myself	14.7	43.8	41.5
Concerns or Worries (14.4% of all episodes)	My work	18.3	42.7	39.0
	My children	8.5	43.9	47.6
	Other family/friends	10.8	53.3	35.8
	Myself	12.7	53.3	46.7

Question 3: Context Demand and Emotion for Mind Wandering and Non-Mind Wandering

Question 3 was this. Did context demand and emotion, at the time of notification, relate to the frequency of participants' reports of mind wandering episodes? In other words, was there something about what was happening at the time of the notification and the emotional state at the time of the reporting that can tell us about participants' likelihood of mind wandering?

The participants in my study, collectively, responded to 7,947 notifications. Of these, participants reported mind wandering episodes 4,294 times. They reported not mind wandering 3653 times. But those who said, nope, not mind wandering, were still obliged to answer three

questions before they could submit their episode. These three questions concerned context, context demand, and emotion at the time of the notification. I analyzed these contextual variables for those who reported mind wandering episodes earlier in this chapter. But I have saved the comparison analyses between the mind wandering and non-mind wandering episodes for the last to find out if there was something about the demands or emotions at the moment the participant reported to the notification that related to mind wandering or not mind wandering.

To begin, I combined the episode level frequency analyses for context demand and emotion into a simple table, Table 4.38. We see that context demand reported by participants who indicated mind wandering episodes when notified had a mean of 2.38, compared to the data from those who reported not mind wandering when notified with a mean of 2.18. The *t*-test results showed a significant difference for context demand for those reporting mind wandering at the time of the notification than those not reporting mind wandering with $t(7,944) = 8.013$, $p < .001$. The context demand at the time of the notification was reported as higher for those who were mind wandering and lower for those who were not mind wandering. Mind wandering respondents reported an episode level mean demand level between *somewhat demanding* and *demanding*.

As for emotion at the time of the notification, Table 4.38 shows that emotion was reported by participants who indicated mind wandering episodes when notified with a mean of 2.64. The participants who reported not mind wandering at the time of the notification had a mean of 2.60. The *t*-test results showed a significant difference with $t(7,944) = 1.929$, $p = .05$. In either case, the means for these reports were in the feeling *pretty good* to *very good* range. Thus, we see a slightly higher emotion for those who reported mind wandering at the time of the notification and those who reported not mind wandering when notified was significant.

Table 4.38

Episode Level Analyses Means for Context Demand and Emotion Reported When Mind Wandering and Non-Mind Wandering at the Time of the Notification (N = 7,947)

Notification report	Mean		n	%
	Demand***	Emotion*		
Mind wandering	2.38	2.64	4,294	54.0
Non-mind wandering	2.18	2.60	3,653	46.0

Note: Statistically significant differences at $p < .001$ (***) and $p = .05$(*).

This broad comparison beckoned me to analyze the means by parent status and gender. I maintained a certain skepticism as high context demand for parents would be expected due to dual demands. I wanted to know if demand levels were reported differently when mind wandering or not mind wandering. Table 4.39 provides the means for context demand for both mind wandering episodes and not mind wandering at the time of the notification. Parents reported over all higher context demand than nonparents. This was true both when mind wandering (2.53 compared to 1.97), and non-mind wandering (2.30 compared to 2.00). What is of importance is that parents reported higher demand when reporting mind wandering, 2.53 compared to 2.30, than when reporting not mind wandering. Nonparents reported demand roughly the same for both mind wandering and not mind wandering. That is, their demand level reports did not show demand was related to whether they were mind wandering or not.

Looking at gender, male participants reported higher means for demand than females in both mind wandering and non-mind wandering episodes. Again, we see that males reported higher demand while mind wandering (2.71) than not mind wandering (2.40). Females reported a lower demand level (2.10) and that this was lower (2.04) when reporting not mind wandering. By combining gender with parent status, male parents reported the highest context demand. They reported higher demand when mind wandering (2.85) than when not mind wandering (2.61).

These data are informed by the demographic data in which male parents reported their workplace was away from home roughly 90%. They also reported for context during mind wandering they were in a work context for roughly 40% of their episodes. Nearly as often, they were in a context related to their children. Thus, their demand was high at both work and home, and they mind wandering more often when the demand was higher than lower.

Table 4.39

Context Demand Means for Parent Status, Gender, and Parent + Gender Reported When Mind Wandering and Not Mind Wandering at the Time of the Notification (N = 7,947)

Demand	Category	Mean	
		Mind wandering (*n* = 4,294)	Non-mind wandering (*n* = 3,653)
***	All	2.38	2.18
Parent status***	Parent	2.53	2.30
	Nonparent	1.97	2.00
Gender***	Female	2.10	2.04
	Male	2.71	2.40
Parent + Gender***	Female parent	2.22	2.11
	Male parent	2.85	2.61
	Female nonparent	1.84	1.94
	Male nonparent	2.19	2.08

*Note: *** p < .001*

I add one more comment on context demand. Although not comparable as participants reporting not mind wandering at the time of the notification did not have intentionality to report, it is relevant to refer to the demand means from Table 4.31 for intentionality. Participants reported demand level as high (2.53) during intentional mind wandering episodes and lower (2.17) during unintentional mind wandering episodes. When parent status was combined with intentionality, this was even more solidly established. Parents who reported intentional mind

wandering episode indicated higher demand (2.88) compared to those reporting unintentional mind wandering episodes (2.52).

The findings for emotion as to parent status and gender are provided in Table 4.40. Parents reported higher emotion than nonparents both when reporting mind wandering (2.74 compared to 2.37) and non-mind wandering (2.64 compared to 2.53). Interestingly, parents' emotion was higher when reporting mind wandering; nonparents' emotion was higher when reporting not mind wandering. Looking at gender, male participants had higher means for emotion than females in both mind wandering and non-mind wandering episodes. By combining gender with parent status, male parents reported the highest emotion, and moreover, they reported higher emotion when mind wandering (2.93) than when not mind wandering (2.80).

Table 4.40

Emotion Means for Parent Status, Gender, and Parent + Gender Reported When Mind Wandering and Non-Mind Wandering at the Time of the Notification (N = 7,947)

Emotion	Category	Mean	
		Mind wandering ($n = 4,294$)	Non-mind wandering ($n = 3,653$)
*	All	2.64	2.60
Parent status***	Parent	2.74	2.64
	Nonparent	2.37	2.53
Gender***	Female	2.47	2.49
	Male	2.85	2.76
Parent + Gender***	Female parent	2.56	2.54
	Male parent	2.93	2.80
	Female nonparent	2.26	2.49
	Male nonparent	2.54	2.72

Note: *** $p < .001$ significance level for parent/nonparent, female/male, female parent/male parent, female nonparent/male nonparent for mind wandering and non-mind wandering. * $p < .05$ significance level for all participants for mind wandering and not mind wandering.

These data reveal parent and gender differences between mind wandering and not mind wandering. They also can be compared to intentionality differences as provided earlier in Table 4.35. When mind wandering was reported at the time of the notification, parents and nonparents indicated experiencing different levels of context demand and emotion. For parents, context demand was higher and emotion was also higher when mind wandering. Of the parent plus gender groups, male parents reported the highest context demand and emotion. The opposite was found for nonparents reports that showed that they experienced and reported lower demand during mind wandering than during not mind wandering. These inform the field of mind wandering research with working adult data that does not conform to previous studies and discussions about demand level and mind wandering (see Appendix K: Methodology Notes).

RQ5: How Did Participant Comments Inform the Mind Wandering Data?

The last question was this: What did working adults have to say about their mind wandering episodes. In what ways did the experience sampling episode comments, by intentionality and thought type, inform the statistical data?

After responding to a notification, participants could add comments. Of 4,294 mind wandering episodes, participants added comments to 614 episode reports (14.3% of the episodes). These comments informed the episodes data as participants reported daily life information. These comments were whatever participants wanted to add. They were not required to explain an episode.

These comments confirm that the mind wandering experience is a human experience specific to the thinker in the moment of mind wandering. Again, I ask readers to remember that mind wandering occurs due to the agency of the person, not the brain. Therefore, my mind wasn't mind wandering, I was mind wandering. I also note that while the comments in the intentional

mind wandering episodes may have similarities with those for unintentional episodes, it was the experience of being open to the thoughts versus having the thoughts pop up that characterized the experience as intentional or unintentional. For example, I could have mind wandering thoughts during a break at work about my child's preschool and I could also have thoughts that pop up while I am working that are about the same topic.

Table 4.41 displays selected participant comments provided at the end of intentional mind wandering episode reports, displayed the thought type the reported for that episode. By indicating the intentionality of the mind wandering and thought type, one can see that the comments share the glimpse of daily life and serve as a fitting way acknowledge the generosity of participants in this study who shared moments of their lives in the spring of 2022.

Table 4.41

Intentional Mind Wandering Episode Selected Participant Comments (N = 352)

Thought type	Comments
Concerns or worries (*n* = 33)	"Worrying about my son while doing the dishes." "In waiting room and worried about work." "Realizing from this study that my mind is seldom not mind wandering." "Was thinking about money stuff while I was driving." "My mother is dying and trying to figure out when to visit." "Making dinner and it wasn't demanding so I was free to think about son."
Creative or interesting experiences (*n* = 97)	"Taking my children out for a fun show." "Thoughts about how to be successful." "Optimistic about the future. Trying to set up plans to actualize my dream." "Walking in Central Park and thinking about spring." "Making coffee and thinking about Russia." "Was washing my hands and thinking about ice-rolling my face."
Day-to-day things I need to do (*n* = 123)	"It's the weekend and I'm doing things around the house." "Cooking for my family." "Allowing my mind to wander while attending a virtual new hire orientation." "Online shopping." "School fee payment." "Listening to a business podcast while coding."
Things I'm trying to figure out or plan (*n* = 91)	"About being promoted at work soon." "Figuring out hole saw problem to design tiny steel furnace in my heater." "Transportation for my kids." "About promotional exams at work." "Thinking about what I want to do in the future with my son." "A celebration."
Other things not listed (*n* = 8)	"Thinking about going to the zoo" "Good image so felt better." "Hungry." "Driving and thinking."

Table 4.42 provides a selection of comments that added at the end of unintentional mind wandering episode reports. The table is again arranged according to the thought type the participant reported for that episode. By indicating the intentionality of the mind wandering and

thought type, one can see that the comments share the glimpse of daily life and serve as a fitting way for us to say thank you to the participants in this study who generously shared moments of their lives in the spring of 2022.

Table 4.42

Unintentional Mind Wandering Episode Selected Participant Comments (*N* = 262)

Thought type	Comments
Concerns or worries (*n* = 84)	"I have too much on my plate sometimes."
	"I have not had a good time with my family for a while now."
	"Financial burdens."
	"A lot of stress. my two babies are so sick doing my best to help."
	"Being sick, feel like my thoughts are not very well gathered. Hard to concentrate."
	"Working late on a demanding project and thinking about my niece who is being bullied."
Creative or interesting experiences (*n* = 33)	"Mind wandering how to design some project for work."
	"Thinking about pallets and building stuff and happened when production spikes at work."
	"Thinking about how I will kiss and hug my boyfriend when I see him."
	"Thinking about my family coming to visit in a few weeks."
	"About a song I heard in the past 24 hours."
	"Talking to my brother but mind wandering about things I want to buy."
Day-to-day things I need to do (*n* = 55)	"It's the first of the month so paying bills always distracts me!"
	"Making lunch and an article headline."
	"Mind wandering on my exercise routine."
	"My dad was diagnosed with cancer."
	"What needs to be done this weekend."
	"Hard day."
Things I'm trying to figure out or plan (*n* = 71)	"Things to do for tomorrow."
	"Thinking about helping family of a deceased friend."
	"Making my writing deadlines."
	"What to give my children as food this morning."
	"Busy with dogs who don't want to be patient in my home office."
	"Thinking about going from telework back to in-person work."
Other things not listed (*n* = 19)	"Serious headache."
	"Need a vacation at a beach asap."
	"Pressure."
	"Need WD40 to fix my chair."
	"Surprised how many time my mind has wander through the day."
	"Proposed. So wedding ceremony next month."

As shown in Table 4.43, though their comments were not related to reported mind wandering episodes, participants submitted 303 comments at the end of their non-mind wandering episodes. These revealed ordinary daily life activities, the same types of experiences that were added by participants who did report mind wandering. With the similarity between the mind wandering and non-mind wandering participant comments, I had two take aways. These are that context demand and emotion at the time of the notification were not predictive of mind wandering. Further, the comments revealed that some people want to say more and others do not as they finish their surveys. This may relate to the "diary" aspect of a multi-day experience sampling study in which reporting becomes familiar as the days go by.

Table 4.43

Sample of Participant Comments Submitted at the End of Non-Mind Wandering Episodes

(N = 303)

"Walking my dog."
"Watching football with my girlfriend."
"Just got back from a trip."
"Just in bed."
"Looking all over the house for baby shoes."
"Making oatmeal."
"Quite focused on what I was reading."
"Settling into work for the day."
"On Facebook. So phone was in my hand."
"Outside enjoying the weather."
"Talking with my husband."
"Putting laundry in and starting breakfast for daughter."
"Knee pain."
"Just waking up … ."
"With kids at playground."
"Out for a beer with friend."
"Paying bills."
"Sick all week."

Conclusions

I conclude that working adult mind wandering in daily life episode findings were neither a monolith nor a variation of lab studies with university student samples. In daily life, this study showed that mind wandering episodes were most often practical, often in the present or future, and differentiated by intentionality. I showed how we can learn about working adult mind wandering by comparing episodes using the two working adult descriptors of parent status and gender. Parents and nonparents reported mind wandering episodes at different rates, with different frequencies of intention. Data analyses demonstrated that gender was another layer of being a working adult such that gender plus parent status contrasted in frequency and mind wandering episode descriptions.

Over and over, the descriptive variable data analyses indicated that intentionality in mind wandering episodes mattered. Participants episode reports of "pop up" unintentional mind wandering and "open to" intentional mind wandering confirmed that they experienced these two types of mind wandering differently. The p values in this study were not just significant, these were highly significant across analyses. I was able to confirm, by asking participants about their episode thought type, that mind wandering was predominantly reported as personal experiences related to practical thoughts, creative and interesting activities, and to a lesser extent, concerns and worries. I shared that content was often about personal motivations and relationships. Temporality results showed that mind wandering connected a working adult not to just place or people, but also time. Most respondents indicated their mind wandering was set in the present or future, not the past, not the "never happened." By asking about context and context demands, I used episode-level data analyses to situate our understanding of mind wandering in daily life, that it happens where we live and work, in common places during varied task intensities. By

asking about emotion, I found that mind wandering was not emotionally deflating but rather, mind wandering was reported by participants mostly when they were feeling "pretty good." In all of these, I found that intentional and unintentional mind wandering episodes were reported as having different characteristics.

After exploring these pieces, I reassembled certain descriptive parts of thousands of mind wandering episodes, ala Marvin Minsky, using crosstabulation to look to put episode parts together to reveal mind wandering episode stories. It was fitting, in this reassembling, that I concluded my data analyses by providing a sampling of the 614 written episode comments, organized by intentionality and thought type so that we could read some of the lived details of reported episodes. These bits of "episode diary" illuminated what I have heard said of mind wandering, that it is common, that it is ordinary. The hundreds of participant comments spoke to kids, work, bills, illness, meals, the parts of daily life. Indeed, even participants who responded to notifications that they were not mind wandering still submitted 303 comments, and their comments showed the same kinds of ordinary life in which mind wandering may or may not occur. Mind wandering happened frequently throughout their days. The sum of these parts, confirmed with data, demonstrated that mind wandering is a rich and vital part of working adult daily life thinking.

Chapter V provides five key findings, relates these to this study's research questions and literature, brings up limitations, and makes recommendations for further research. Yes, Chapter V does that. But right now, I want to close this chapter that I have loved and become a researcher within its writing, with a message that guided me when the going was muddy, "No risk is more terrifying than that taken by the first root. A lucky root will eventually find water, but its first job

is to anchor" (Jahren, 2016, p. 54). This study has sent out a root to anchor our knowledge about

mind wandering in the daily life of working adults with new findings.

CHAPTER V: DISCUSSION AND RECOMMENDATIONS

Not all those who wander are lost**.**

—J. R. R. Tolkien, *The Fellowship of the Ring*

Tolkien's quote begins Chapter V with a birth announcement. I have good news. Working adults are not wandering into the hinterlands. They are people for whom mind wandering is a common part of their thinking life, most often intentionally so. They frequently mind wander practical thoughts about people and things that matter to them personally. They are not stuck in the past. They seldom mind wander about things that never happened. They mind wander wherever they are. Context demands do not thwart their mind wandering frequency. They are not unhappy.

This chapter brings meaning to these sentences. I present key findings and answer the study's overall research question. I relate exploratory results to the literature in the field, point to limitations of the study, and offer recommendations for future research. Only then do I add my last drawing and comments.

I conducted this research to expand our knowledge about thinking that has been described as when the individual's conscious experience is not tied to the events or tasks one is performing (Seli et al., 2018). Mind wandering has been said to be a common brain activity that involved thinking about things, people, and experiences not present in time or place. Researchers reported findings that task-unrelated thinking occurred during 30%–50% of adult waking time (Franklin et al., 2013; Killingsworth & Gilbert, 2010). But these frequency findings were most often collected from student samples in controlled settings. Kane et al. (2017) cautioned that the investigation of mind wandering in laboratory settings might be incomplete when considering mind wandering as experienced in daily life in which respondents are not in a single environment with controlled exposures to contrived tasks.

My inquiry met Kane's challenge of getting out to ask working adults ages 25–50 from across the United States to report their mind wandering experiences while in their kitchens, at their work desks, in the middle of football games, or even on construction sites. Working adults in this study carried this study, for this research was portable, everywhere they went on smartphones equipped with an experience sampling app at the ready in a pocket or purse or next to a laptop, participants answering random notifications to say, we aren't lost.

I explored working adult thinking by investigating their mind wandering episodes because I believe discovering this missing information increases our understanding of working adults as individuals, as people we lead, people we know, people we are.

Key Findings

My overall exploratory research question was this: What can we learn about working adult mind wandering by studying the rates and characteristics of overall, intentional, and unintentional daily life mind wandering for working adults, by parent status, and gender? Five key findings confirm new knowledge about working adult mind wandering.

Key Finding #1: Working adults reported that mind wandering was a common part of their thinking in daily life. These frequency findings were confirmed by using participant level and episode level analyses at 54% and 55% respectively. Working adults reported they were mind wandering over half of the time when randomly notified during daily life. This was more frequent than the findings of other studies, most conducted in laboratory settings, that had frequency ranges of 30%–50%.

Key Finding #2: Working adult mind wandering was reported as more often intentional than unintentional, and rates of intentional and unintentional mind wandering varied by parent status and gender. These frequency findings were confirmed by using both

participant level and episode level analyses. These showed that parents reported mind wandering episodes more frequently than nonparents. When gender was added, male parents reported mind wandering more frequently, and more often intentionally, than female parents and both genders of nonparents. Working adults reported intentional mind wandering during over half of their mind wandering episodes. Parents reported well over half of their episodes were intentional mind wandering. Nonparents reported an even split on intentionality of mind wandering.

Key Finding #3: Working adults reported mind wandering episodes that most often had practical thoughts about people and things that mattered to them personally happening in the present or future. Practical thoughts, which combined response categories of day-to-day things I need to do and things I'm trying to figure out or plan, accounted for nearly 60% of working adults reported mind wandering episodes. When thought type was combined with content, commonly about *my children* and *my work* for parents and *myself* and *my work* for nonparents, things that mattered to the participants personally were best revealed. While the thought type *concerns or worries* was reported more often during unintentional mind wandering episodes, it was mostly related to content about myself and more often reported by female nonparents. Parents reported their mind wandering episodes were more in the present than nonparents' episodes which were more future-oriented. Once again, intentional and unintentional episodes were reported as different with more past oriented episodes during intentional than during unintentional episodes. Even with this, episodes were seldom reported as being about the past and rarely about things that never happened.

Key Finding #4: Working adults reported mind wandering episodes having thought content that was the same as context in over half of their episodes. Of all episodes, 56.3% were reported as same thought content and context. The most frequent episode combination was

content about *myself* while by *myself*. Similarly, 43.7% of the episodes were reported as not the same content as context. Again, these findings were explored through intentionality, parent status, and gender analyses.

Key Finding #5: Working adults who were mind wandering at the time of the notification reported significantly higher context demand and emotion, when analyzed by parent status and gender, than those reporting not mind wandering at the time of the notification. The data were analyzed using episode level analyses for mind wandering episode responses and non-mind wandering notification responses.

How Did Key Findings Answer My Overall Research Question

This was an exploratory study conducted in real life conditions. There was no prior research dedicated to investigating working adult mind wandering episodes to learn how this thinking was experienced in daily life. This study's findings can be used to establish new areas of inquiry within the fields of leadership and change, thought process research, and intrapersonal and interpersonal psychology. The overall research question I sought to answer was this: What can we learn about working adult mind wandering by studying the rates and episode characteristics of overall, intentional, and unintentional daily life mind wandering for working adults, by parent status, and gender?

The key findings joined together to answer to this question: we can learn through these research findings to appreciate the everyday mind wandering episodes of working adults as occurring frequently, typically concerning things mattering to the individual personally, with content just about as often in context as out of context, far more often practical thoughts about day-to-day or things to do than concerns or worries, and mostly reported as happening when feeling pretty good. We can appreciate that mind wandering episodes were indicated more often

when context demand and emotion were higher for working parents, less so for nonparents. In a shorter sentence, we can learn to appreciate mind wandering as a common feature of working adult thinking in daily life because we now have daily life research to say this is true.

I do not suggest this lightly. Learning to appreciate a certain type of thinking, which in this research means an acceptance of personal mind wandering dispersed throughout the day, is different than saying, "oh well, you know, those thoughts..." Our cultural bias has been and lingers still that mind wandering is something a person does that takes away from productivity. Yet, as reported in Chapter IV, results of this study indicated that participants reported mind wandering episodes about work while at work were 54.9% plus additional time mind wandering about work while with children, family/friends or by myself. That's a lot of mind wandering about work related content! I posit that it is more accurate to say that mind wandering is a co-existent thought process that accompanies us during task, mixed in rather than a separate thought process we enter and exit during our waking hours.

As referenced previously (Price, 2017), our American culture hardened around being on-task. But the results of this mind wandering exploratory study conducted outside of labs in real life indicate working adults are often not thinking about what they are doing, every day and everywhere. I recall Poerio et al. (2013) investigating the Killingsworth and Gilbert (2010) claim that mind wandering caused unhappiness. The researchers presented the logic that if mind wandering caused negative mood, then not mind wandering would improve mood, but since mind wandering was reported to occur at such frequent levels, this was impossible to extract. I advance a similar logic on whether mind wandering is inherently contrary to being productive for working adults. If one said that mind wandering frequency caused unproductivity, then not mind wandering would cause productivity, but since mind wandering in this study was reported at

such frequent levels, how could you turn off a participant's mind wandering to determine if this is true? You couldn't.

What we can learn from the results of this research is how to listen to the invisible thinking of working adults in daily life. In this study, they were able to discern their mind wandering and the differences between their intentional and unintentional mind wandering episodes. While self-report data has inherent subjectivity, it was that very subjectivity that I wanted to learn about, what do *you* think you are thinking? Because really, who else would know but the thinker? There was no right or wrong answer. There was the experience of answer and self-report. What this study did for participants and working adults everywhere was to add credence to mind wandering being common and ordinary, often useful, being about things that are personally important or relevant to us. As the language in our culture has comingled "be present" and "be productive," this study demonstrated through its findings that mind wandering is not a subtraction from being present, but part of the nature of being present.

Developmental psychologist Kegan (1982) said, "we are not the self who hangs in the balance at this moment in our evolution. We are the activity of this evolution" (p. 169). This activity, as the findings of this daily life study confirm, includes mind wandering, happening across our lifetimes, happening each day during over half of our waking hours.

Key Methodology Findings for Leadership and Change

I relate the overall research question for this study to methodology. What can we learn about working adult mind wandering by studying the rates and characteristics of overall, intentional, and unintentional daily life mind wandering for working adults, by parent status, and gender? Here are four key methodology findings that inform research in the field of leadership and change.

Key Methodology Finding #1: Experience sampling proved an essential quantitative research tool to inform leadership and change about mind wandering in the daily life of working adults. This study broke new ground for research methods used in leadership and change by demonstrating a way to conduct a large study using a smartphone app to collect real-time experience sampling about participants' non-task related thinking. I have posited several times that we need to have such research to better understand each other as individuals, and further, understand that our personal non-task related thinking is intrinsic to the overall ways in which we are processing information and emotions while we are working together. This understanding deserves more attention in the field of leadership and change.

 Few mind wandering studies have been conducted outside of the lab in daily life. Killingsworth and Gilbert's (2010) large study with non-university subjects and the small study by Kane et al. (2007) with undergraduates come to mind. As their research was conducted before the ease of smartphone apps, Kane et al. still noted that experience sampling in daily life was a promising research method. Linz et al. (2021) conducted a study with 97 student participants intended to see how mind wandering content differentially translated from the lab to daily life in research related to subjective stress experience. Linz et al. noted in their results that daily life situations present more complex ecological contexts that might not be easily comparable to the lab situation. For the field of leadership and change, comparability will come of conducting more real life research to inform the scholarship of leadership and change as to daily life non-task related thinking. Such experience sampling studies in leadership and change can generate "real time" data that captures the complexities of work and life contexts for the people we lead and the leaders we inform.

Key Methodology Finding #2: A social media generated sample and a smartphone experience sampling app demonstrated the future of real time research in the daily life of working adults. Social media ads reached new participants. By not using a study participant supply company, my research went beyond convenience and study veteran samples. Conducting research using a phone app meant this study's short survey went everywhere study participants went as they lived the study. This is good news for the field of leadership and change.

Key Methodology Finding #3: Participant level and episode level data analyses provided two ways of understanding data. I measured mind wandering frequencies using participant level and episode level analyses. The results confirmed high rates of mind wandering, intentional and unintentional, and by parent status and gender. I analyzed characteristics by episode level analyses. I did not seek to characterize one person's experience with mind wandering, but episodes within condition, e.g., parent status. Episode level data analyses were the best methods for analyzing the descriptive data in my study so that the focus was on the mind wandering experience. Using episode level rather than participant level analyses may facilitate more research for leadership and change and shift focus to the experience, not the person reporting the experience, changing the way we talk about data. For example, an experience sampling study could gather data in the workplace about stress, fatigue, satisfaction, and more.

Key Methodology Finding #4: Keep it simple because it gets big fast. I asked eight questions, and I received 4,294 answers to each question. I sent out six notifications each day, and participants responded to 7,947 of these. I sought a bigger sample than I needed because this study design in daily life settings, particularly for unknown participants, required a fair amount of data cleaning to assure the validity of the sample.

Key Findings Contributions to the Literature

With this study, I have contributed to the literature by providing evidence that mind wandering occurs frequently in the daily life of working adults. I have also contributed descriptive information about mind wandering episodes and how these episodes differ according to intentionality, parent status, and gender. In this section, I relate my research findings to a selection of studies and papers originally in Chapters I, II, and III.

Key Finding #1: Working adults reported that mind wandering was a common part of their thinking in daily life. Mind wandering has been defined as when an individual's conscious experience is not tied to the events or tasks one is performing (Seli et al., 2018b). It has been described as shifts in attention away from a primary task toward the individual's internal information (Vannucci et al., 2017, p. 61). My definition was simple, "thinking about things not about what I was doing." As Weinstein et al. (2018) posited, framing is best when the researcher uses the words that match the construct of interest. This, therefore, was what participants in this study reported, doing one thing, thinking about something, anything, whatever else.

My study's working adults mind wandering frequency finding was consistent with but somewhat higher than predominantly lab-based research at 54%–55%. This somewhat higher frequency was confirmed using both participant level and episode level analyses. I designed my research to focus on the mind wandering episode. However, I wanted frequency comparability to other studies, most using contrived task in standardized conditions with participant level analyses.

As previously stated, mind wandering has been established as a common brain activity that involves thinking about things, people, and experiences that are not present in time or place.

Researchers have claimed this task-unrelated thinking to occur during 30%–50% of adult waking time (Franklin et al., 2013; Killingsworth & Gilbert, 2010). This percentage of time engaged in mind wandering has been reported with a range of percentages because different lab and daily life settings have different task demands, samples, and research questions. As well, studies in controlled and short-term settings can assure a compliance rate such that participants respond to all notifications. That is impossible in a daily life study. I used this range from the field to compare my frequency findings. My study participants told me they were mind wandering often.

Key Finding #2: Working adult mind wandering was reported as more often intentional than unintentional, and rates of intentional and unintentional mind wandering varied by parent status and gender. Both participant level and episode level findings for all participants showed that intentional mind wandering was about 10%–18% more frequently reported than unintentional mind wandering. The findings showed that parents reported that they mind wandered more than nonparents, and their intentionality was also different with parents reporting intentional mind wandering considerably more than nonparents. Both participant level and episode level analyses indicated the same finding. Parents reported intentionally mind wandering during well over half of their episodes. This contrasted with nonparents reporting intentional mind wandering during less than half of their episodes.

Certain studies found intentional mind wandering, reported as when an individual responded as "open to" mind wander, and unintentional mind wandering that "just popped up" were related to different contextual factors, i.e., intentional mind wandering to low task demand and repetitive task performance, and unintentional mind wandering to high sustained and monotonous task demand wandering (Christoff et al., 2016; Golchert et al., 2017; Seli et al., 2017, 2018).

My study did not find this to be true for all participating working adults. Intentional mind wandering episodes were reported as more frequent during higher context demand by parents. This fits the research assertion in Chapter I that working parents have essentially two jobs, atelicity of parenting life, and consequently may have higher demand levels as a constant than nonparents. Unintentional mind wandering episodes were reported as more frequent during lower context demand. When parent and gender were combined, intentional mind wandering was reported during *very demanding* and *demanding* demand level by male parents (71.7%). By contrast again, female nonparents reported nearly half of their intentional mind wandering episodes occurred during low demand. But then, they reported their unintentional mind wandering to also be during low demand.

My point is my study data did not fit this contextual factor finding. Perhaps demand level in the nonlab setting of daily life is many things, i.e., circumstantial, subjective, multi-faceted, and dynamic. Those researchers reporting finding this relationship between low demand and intentional mind wandering conducted lab-based studies wherein they could set the level of task demand in a particular and continuous way. Tasks were often monotonous and not comparable to daily life activities. Context demand in daily life has other features as well, i.e., cognitive or physical demand, the demands of others on you, the sense of demand because you are tired or sick, etc. Context demand is not only about a task you are presented, but also about how you within that context experience the context demand.

Let me consider two aspects of these findings, the nature of parent status and researchers' discussions about intentional mind wandering. First, we learned in previous chapters that working parents have dual role demands and unendingness of tasks related to parenting. Parenting could aptly be understood as atelic (Irving, 2016, p. 83). Irving reminded us that atelic

events do not come to an end point (p. 79). The atelic nature of parenting is its open-endedness. The responsibilities for working and parenting are considerable. Perhaps parents' increased rates of mind wandering were related to the human social motivation associated with long-term familial bonds, or kin care, focused on the care of children (Ko e al., 2020). By this, I mean "responsibilities are on my mind," not that these were concerns or worries. As my study showed, these thoughts were predominantly about practical things to get done or plan.

The working parents in my study reported a high level of intentional mind wandering despite high demand daily lives. So the findings of my research regarding high rates of intentional mind wandering reported by working adults and particularly by parents were new and not aligned with lab-based research descriptions of demand states. This creates an opportunity to invite future research to describe the context demand states within the daily life of working parents. My findings do not appear to agree with Seli et al. as intentional mind wandering in my study was most reported by those participants with more balls to juggle in daily life, e.g., working parents and, further, working dads. More research would be needed to explore the assertions by Golchert et al. (2017) concerning unintentional mind wandering occurring during high sustained and monotonous task demand. I suggest that part of the difficulty in reconciling findings could be the interpretation of high or low demand as if demand is a single dimension, such as light, with a dimmer light switch to turn it to bright or low. More likely, working adults in this study reported mind wandering episodes when notified at random times throughout the day without a continuous demand state. It was not as if they had to assume a pose to mind wander. The activities and contexts of daily life do not demonstrate a continuous demand state as presented in the lab during controlled studies.

Another issue for intentionality was presented by Seli et al. (2016a) who said that when collecting data concerning the occurrence of intentional or unintentional mind wandering, researchers were beholden to the subjective nature of respondents' self-reports. They cautioned that participants' self-reports were inherently based on self-generated criteria, noting this concerned all self-reported mind wandering research, in labs and in natural settings. My data analyses found that despite the subjectivity of reporting intentionality, participants reports were congruent with other episode characteristics, intentional mind wandering being different in ways I expected, i.e., intentional mind wandering having more practical thoughts, unintentional mind wandering having more concerns or worries about self.

This suggestion in the literature of causality with task demand state and intentionality of mind wandering was beyond the scope of my research. The new information this study provided was that context and context demand are multi-dimensional and are not standardizable from person to person. More naturalistic setting research with a diverse sample of working adults could further investigate this, but I am doubtful that the lab-based contrived sustained task can find an equivalency of sustained task in daily life studies.

Key Finding #3: Working adults reported mind wandering episodes that most often had practical thoughts about people and things that mattered to them personally happening in the present or future. By examining and later linking episode characteristics, specifically thought type, content, and temporality, my study findings revealed the common elements of mind wandering. As Klinger (1971, 1975) claimed, we think about what matters to us personally, as humans, we mind wander primarily about matters of self-importance. Again, Ko et al. (2020) put forth that human social motivation of kin care is the primary motivation for all of us, particularly about caring for children. The study findings showed that mind wandering

episode thoughts were often reported about *my children* for both female and male parents. Zedelius and Schooler (2018) posited that researchers found mind wandering thoughts were more often about everyday things, more often pleasant than negative, and future oriented more than past or present. Nonparents reported mind wandering episodes with lots of mind wandering about myself in the future.

My study results agree with Klinger, Ko et al., and Zedelius and Schooler in the following ways. I found that working adults mind wandering thought types were highly clustered as practical thoughts, that is day-to-day thoughts and things I need to do or plan and further had content about people or things participants cared about. These were set in the present or future. I gave working adults just a few content choices, the common ones of my work, my children, other family and friends, myself, and other things. If the first four choices were not descriptive of their mind wandering content, participants would have chosen other things. But they seldom chose other things, not for thought type or content. This meant that the common, mostly relationship-based choices I provided described most of their mind wandering episodes.

Researchers have looked at temporal focus and self-reflection in mind wandering (Smallwood et al., 2011) and posited that intentional mind wandering was more often about future events and prospection; unintentional mind wandering was more often related to past events or retrospection. I wondered when I read this, did you ask them about the present? And the future could have been as soon as they left the lab. We need more details when we use the word future to understand means somewhat far off, and the past is done and gone. Present is the term we use, often loosely, for the moment, the next few hours, today.

In this study, participants most often reported their mind wandering episode thoughts were set in the present or future. Seli et al. (2017) found intentional mind wandering associated

with significantly higher reports of future oriented thinking. In this study, thoughts about the past, while not highly reported, were most often reported for intentional mind wandering episodes. More thoughts about the future were reported for unintentional mind wandering episodes. Thus, this study's findings disagreed with Seli et al. on intentional mind wandering and future orientation, finding the opposite to be reported. Yet, I add a word about temporality and terms for past, present, and future, as these are big and personally experienced buckets of time. Without restricting, perhaps arbitrarily so, a person's sense of future, a researcher cannot be certain if a participant meant this afternoon or 20 years from now. Similarly, a participant's sense of past could be yesterday or a day in one's childhood. Thus, investigations of temporality in "future" studies would benefit from a standardization of what is meant by these big chunks of perceived timeframe, standardization that incorporates participant input to describe temporality.

My sense is that a researcher cannot make a statement about intentionality without being clear as to who the findings fit and considering demographic features for those participants. Those in this study who reported unintentionally mind wandered at a higher rate about the future were more often mind wandering about themselves and were nonparents. These nonparents were, from this study's demographic data, more often younger, 25–32, than parents in this study who were more often in 33–42. Those in this study who intentionally mind wandered at a higher rater about the past, again, not a lot of reports, reported episodes of mind wandering about their children or work, and these were parents. Why not remember your son's first birthday party or the good time you had at a high school football game with your daughter?

One last comment, there was a temporality choice for *never happened.* This gave participants an option to report thoughts about anything not within their daily life. This option

was seldom chosen (see Appendix K: Methodology Notes). Respondents' episode reports indicated that they were thinking about themselves, their work, their families, and their friends.

Key Finding #4: Working adults reported mind wandering episodes having content that was the same as context in over half of their episodes. Key Finding #4 was harder for me to relate to the research. During the years of mostly lab-based mind wandering studies, the researcher controlled for the task and context of that task during experience sampling. This created a sustained contrived task level in a non-interrupted context. The researcher might have asked, what are you mind wandering about (content) but not "when responding to this notification, I was doing things mostly related to …" because there was no context to ask the participant about.

The opposite was true in my daily life study. Participants were engaged in all sorts of complex and simple tasks that were naturally interspersed during their days. The numbers of randomly timed experience samplings in varying circumstances gave the study a robust range of contexts and opportunities for in and out of domain thinking.

To look at the mind wandering content–context relationship, I considered context as having many attributes beyond a chair or lab. One such aspect of daily life context is transition. We do it constantly, taking our eyes off the page to grab our coffee, answering a text, getting up to go to a meeting. Faber et al. (2018) investigated the effect of changing activity on mind wandering, that is, breaking the continuity of what one was doing. Specifically, the authors looked at event change and self-reports of mind wandering. They found that event change directed attention to stimulus processing and away from mind wandering. In other words, subjects stayed engaged in what they were doing as what they were doing transitioned to something new. Faber et al. attributed the effect to stimulus processing (p. 136) and posited that

it decreased the rate of reported mind wandering because the change in tasks caused subjects to anticipate event boundaries.

These and the obvious attributes of "context," such as being with my children or sitting at my desk, have yet another important feature that may affect mind wandering context and thereby content. That is stimuli. Murray and Krasich's (2020) position, considered the standard view in the field of mind wandering research, was that mind wandering was only mind wandering if the subject had task unrelated, stimulus-independent thought. If this were the view for all research, the questions would be these: How could you mind wander about your kid if you were in your house? How could you mind wander about a problem you were having with a co-worker if you were at work? My response to this position of stimuli-independence is that it is impossible to find stimuli-free circumstances in a daily life context. Humans are swamped in stimuli and have adapted to having all sorts of gadgets and images and smells and voices around us.

My findings could suggest that mind wandering episode content and context have a causal relationship. However, I note two aspects of these data that limit this conclusion. First, the experience sampling notifications were timed between 9 a.m. and 8 p.m., allowing for many work hours for a participant to be responding during his or her work time. This also meant that working parents had many hours with their children during which they received notifications; those without children would have had many after work hours to be by themselves or with others. In other words, although this data suggests a relationship that may be causal, if you are somewhere in the day for a long time, your thoughts will include your activities within that place. Where context might correlate with content during many hours, content may be ongoing, e.g., things we are thinking about that day, and doing what we are doing is a setting. Secondly, the stimuli issue is tricky. Stimuli are everywhere, even our phone nearby can trigger thoughts of

work or family or ordering take out. Therefore, it makes sense that when we are somewhere, our mind wandering thought content is often, as this study found, over half of the time, related to that somewhere. I deem this a fact of daily life in a world of multi-layered and constant stimuli.

The other half of this content-context finding was exciting for me as a researcher. While we saw that 56.3% of mind wandering episodes reported content and context were the same, that still left 43.7% of episodes in which content and context were not the same. These "not the same" findings support the human experience out-of-domain use of mind wandering that I described in Chapter I when I posited that an aspect of mind wandering, that is, when we think of things that are not where we are and not about what we are doing, could be how we connect with other aspects of our lives. I was stymied because boundary theorists said that people try to minimize the difficulty and frequency of role transitions and interruptions (Ashforth et al., 2000). Researchers proposed that "working adults develop boundaries around work and personal life domains that vary in strength" (Bulger et al., 2007). In other words, when at work, think about work, and so on. My study's Key Finding #4 shows that roughly 43% of mind wandering episodes in daily life study were reported as "out of domain." Yes, we do use mind wandering to unify, visit, and process our human experiences both within and beyond domains. This study's results confirm that participants often mind wandered outside of the domain in which they were at the time of the notification.

I return to address the whole of this key finding. Working adults reported that over half of their mind wandering episodes were related to content that was related to their context. That is, they mind wandered about their kids while doing things related to their kids, etc. There is no research for me to agree with or disagree with on this point. However, the lack of comparability is also an opportunity. This study provided a dissonance (Wergin, 2018) to encourage further

mind wandering studies with working adults to explore the relationship of content and context with respect to the fluidity of context and content from the domains of home, work, and school. Where once these domains were separated by geography, they are now integrated by technology and at the ready on smartphones near an elbow or cup of coffee.

Key Finding #5: Working adults, specifically parents and male parents, who reported mind wandering when notified indicated higher context demand and emotion when mind wandering and lower demand when not mind wandering. Whether they were mind wandering or not at the time of the notification, all participants were asked to answer questions when randomly notified by the experience sampling app. Those who were mind wandering answered episode characterizing and context questions. Those who were not mind wandering only answered three context, demand, and emotion questions. I asked all to respond to every notification regardless of mind wandering to compare these data to understand if either context demand or emotion at the time of the notification indicated that emotion or demand related to the frequency of mind wandering episode reporting.

Episodes were analyzed first for demand. Context demand was significantly higher when mind wandering episodes were reported ($p < .001$) than when no mind wandering was reported at the time of the notification. As Chapter IV findings revealed, parents and nonparents reported contrasting data. Parents had high demand levels that were higher when reporting mind wandering, most noticeably for male parents, than when reporting not mind wandering. By contrast, nonparents reported about the same demand whether mind wandering or not, and, they reported a lower demand. Thus, this finding is important to recognize that parents were mind wandering during high demand, a state they are likely in as part of being working parents, but

their mind wandering demand level was higher than not. This finding means that it matters not to treat all working adults as a crowd, but to investigate parent status and gender.

Emotion was also reported as significantly higher at the time of the notification for mind wandering episode data ($p < .05$) than not mind wandering data. Again, the differences were noted in Chapter IV as to parents reporting higher emotion levels than nonparents, when reporting mind wandering and when reporting not mind wandering. Those feeling most upbeat were male parents who reported very good at the time of the notifications. To consider these findings simplistically, were participants reporting being busy and upbeat at the time of the notification? Yes. More so when mind wandering? Yes. And were the parent participants reporting this even more so than nonparents? Yes. What about dads? The data said yes. In other words, being in demanding situations seems to go with the flow of mind wandering for those who are likely in demanding situations, like working parents, by the atelic nature of their lives with work and children.

To relate my findings to the literature, I first refer to Smallwood and Andrews-Hanna's (2013) second hypothesis, *the context regulation hypothesis*, which posited that mind wandering was most prevalent in nondemanding contexts, that costs and benefits were context dependent, and that there were experimental considerations needing a range of different contexts. The researchers observed that the trend in mind wandering lab-based research was to conduct research in experimental contexts with complex tasks that imposed continuous demand levels on university-aged subjects. They said that mind wandering during such continuous complex thought conditions was observed to lead to error on many levels—poor comprehension, poor encoding of material into long-term memory, and absent-minded forgetting. Smallwood and Andrews-Hanna posed that mind wandering in the context of such complex task was decreased

and did not speak to daily life. "Simple tasks are also closer to the environment in which we are likely to experience most self-generated thoughts in daily life" (p. 2). In other words, these studies informed my findings but were not based in comparable circumstances.

To experience what researchers meant when they said, "sustained contrived task," I participated in two university study mind wandering studies. These lasted under an hour and were taken online. I found the reading material tedious in one and interesting in the other. I experienced cognitive boredom with one while the other was familiar. Thus, researchers' choices of contrived tasks, the nature and familiarity, may not be comparable from study to study. For example, Seli et al. (2018a) involved 60 men and women between 18 and 35 years of age in a clock in a tedious lab task. However, the researchers' discussion of resource-control account of attention related to my findings as they said their study demonstrated that "strategic modulation of the allocation of resources to primary tasks and mind wandering can occur on a moment-to-moment basis in anticipation of changing tasks demands" (p. 6). Seli et al concluded that people can adjust mind wandering as they look ahead to task challenges; this adds to the research on transitions in task (Faber et al., 2018). These studies illuminate what participants in this study may have been experiencing at the time of a notification. Further research will be valuable on the nature of context demand in natural settings.

My findings in this daily life study were at odds with lab-based research on context demand in which researchers measured mind wandering within a sustained contrived task level thereby producing non-interrupted context. In my study, context demand was neither sustained nor contrived. I considered Smallwood and Andrews-Hanna's assertation that mind wandering in the context of complex task was decreased and proffer three aspects of understanding tasks and context in daily life. One is that demanding tasks are not synonymous with complex tasks. For

example, completing tasks to meet a deadline increases context demand, but we cannot assume the tasks are complex. Further, complexity outside of the lab may be composed of emotional, transitional, relational ingredients beyond the task itself. Third, as Seli et al. (2018a) put forth, participants may be allocating their attention in the moment as they move between primary tasks and mind wandering.

Kane et al. (2007) looked at contextual predictors of mind wandering using experience sampling and recognized subjective aspects of context such as being tired or stressed, being in a boring or unpleasant activity, and so on. In their undergraduate student experience sampling study that gathered data between noon and midnight for seven days, the authors recognized that context is dynamic and full of subjective attributes that vary from person to person. What was particularly of interest to me were observations by Kane et al. about laboratory tasks. The authors said these were typically "unfamiliar, long, repetitive, present impoverished stimuli, have no practical relevance, and may be perceived as evaluative" (p. 618).

With regards to comparing my study's findings to the literature on mood or emotion, researchers have commonly referred to the Killingsworth and Gilbert (2010) large daily life experience sampling study that asserted mind wandering was associated with negative mood. This study has been revisited as it did not distinguish intentionality of mind wandering and the sample may have been biased with regards to users of a happiness app. But the point is, Killingsworth and Gilbert's study took on an ongoing freely floating iceberg in mind wandering research, that was the relationship between how we feel and how we think.

Years later, Choi et al. (2017) looked closely at momentary experiences of happiness and meaning. Also using experience sampling, they said that levels of happiness and meaning fluctuate considerably during the day. Further, they stated that contextual factors, i.e., who a

person was with, type of activity, time of day, predicted moment of happiness and meaning. Their study engaged over 600 university students from around Korea. The research supported the conclusion that the relationship between happiness and meaning in the moment was not static (p. 647). Franklin et al. (2013) found mind wandering was sometimes associated with positive mood. The study by Franklin et al., combined with Killingsworth and Gilbert's results, described that while mind wandering content could influence mood, mood must be understood in the context of the episode itself. Episodes considered to be of high interest and/or high usefulness to the individual could produce positive mood; those considered of low interest and low usefulness could have the opposite impact.

These studies investigated mood which is an emotional state that can last for hours or longer. Emotions last anywhere from seconds to minutes (Ekman, 1993). I did not ask my participants to assess their mood, something I felt involved reflective thinking, but rather report how they were feeling at the time of the notification whether mind wandering or not. I gave them easy categories, not wanting to use words that suggested feeling bad, e.g., feeling bad. I wanted a quick sense of their feeling to learn about their emotional energy at the time of the notification to explore if there were some relatedness to mind wandering or not mind wandering.

What I found was that my study participants mostly indicated they were feeling pretty good at the time when they were notified and reported mind wandering. This feeling was somewhat less good but not bad when reporting not mind wandering at the time of the notification. These results contrast with Killingsworth and Gilbert's (2010) findings that mind wandering was associated with negative mood. These findings are consistent with results by Choi et al. (2017) that happiness was not static in that these feelings of "pretty good" were reported at various times in the day when mind wandering was reported.

Poerio et al. (2013) posited that emotions preceding mind wandering affected mind wandering in a congruent way. With regards to time orientation, that is, whether the mind wandering was focused on the past or future, their study provided evidence that feeling sad before mind wandering predicted a focus on the past. (p. 1417). Poerio et al. offered four conclusions that indicated that mind-wandering was not inherently detrimental. The fourth of these was that precedent mood impacted how relevant mind wandering was to a person's current life concerns. My exploratory findings did not investigate precedent mood as I would have had to ask the participant reporting not mind wandering to get back to me a bit later to report again, or something such as that. Because of the greater context at the time of my study, i.e., just coming off another wave of Covid, Russia's invasion of Ukraine, rising inflation and supply chain shortages, I knew emotion within a context was bigger than the moment or the person. My findings were that working adults responding outside a lab were mostly feeling pretty good when reporting mind wandering and less so if not. More daily life research examining mind wandering and feelings may inform these findings.

Limitations

I took considerable care to design and execute this exploratory experience sampling research, conducted on a smartphone app with notifications randomly happening throughout daily life, because I sought data and findings worthy of breaking new ground both for the field of Leadership and Change and the fields of Psychology and Mind Wandering Research. I could have reduced the scope to the kindness of a few people in a room answering notifications within an hour. However, I came to this study with my own curiosities, and these would not be answered by shrinking my vision. Instead, I stepped up to every demand of this research even when I had never heard of the next thing on my list before I had to do it well. This included

choosing a definition of mind wandering that was straightforward for participants. In my view, definitions using language known only to researchers are apt to make participants self-conscious in unpredictable ways, perhaps erring to be hesitant about reporting mind wandering.

The first limitation is always personal. Going back to Chapter I, I said that I value mind wandering because I find it an important part of my thinking life. In conducting this study, I had to moderate my own enthusiasm for my findings to be sure I was describing them without too much "yippee!" I fussed over my participants in my own mind wandering, hoping they did not answer the notification when crossing a street or during an off moment with their spouse. It is highly likely respondents did the best they could, as did I during the five times I self-tested the study, to catch potential transitory thoughts. Satisficing, the tendency to avoid cognitive effort on survey questions (Weinstein et al., 2018) was possible as it always is in self-report studies. Weinstein et al. concluded that the possibility of response bias was increased by too many response options. I reduced both my questions and response options. A limitation was that I could not ask every question I wanted to ask. But the quality of the data was the better for my restraint.

The second limitation for this study was that participants were not quantitative study veterans made available for a price through a participant recruitment platform company. I went straight to social media to invite and incentivize my sample. While this method generated a sample from all over the United States, from cities, towns, suburbs, and rural places, there were also obstacles. This limitation meant I was not able to "order" an exact demographic sample for a working adult study. Thus, my sample demographics show that while my participants were diverse in many ways, participants had a higher level of education overall than the general population of working adults. It was possible that a study on mind wandering interested more

people who wanted to know about brain function. It was also true that an experience sampling study, by its nature in daily life, is interruptive, and those who had work or life situations in which they could not carry or answer their phone could not participate. Lastly, while we assume every adult has her or his own smartphone, this may not be true. Those without access to a personal smartphone could not participate so their data was not included in this study.

A third limitation relates to missed notification responses. In a lab for an hour, notifications are answered within a confined context. In a daily life study, notifications can be missed and the data for these not collected (see Appendix K: Methodology Notes). Working adult daily life conditions were considerably varied, i.e., being notified during noise, discomfort, personal fatigue, a work meeting, driving, and more. Those in certain work settings, i.e., fast-paced service sector or distribution site, may not have participated. Parenting situations may also have impacted participation, e.g., parents of young children unable to find a free hand to respond. As well, participants may have been in situations where it was not safe to stop doing what one was doing to respond. The most obvious was driving. I instructed participants not to respond in hazardous situations. All in all, these may have resulted in reducing the range of daily life experiences data collected so that we do not know about mind wandering about during driving, leading a meeting, running a tractor, or other activities. I purposefully collected thousands of episodes across several months with hundreds of participants from nearly every state in the United States to anticipate some data would not be collected by happenstance.

A fourth limitation for self-report data in real life conditions was that I could not know participants' physiological stimuli and possible effects on respondent episode mind wandering related to energy drinks, coffee/caffeine, alcohol, drugs, or underlying health conditions at when notified. Related to this is that the researcher cannot know the extent to which circumstantial

stimuli, i.e., lack of sleep, a preceding argument with a teen, are evoking or providing content for the reported mind wandering episode.

A fifth limitation concerns the unstandardized nature of daily life research. While exciting for their "real world" unpredictability, naturalistic studies cannot be compared, neck to neck, with lab setting studies designed with contrived tasks and university student samples. Again, the best response to this for me as a researcher was to gather a lot of data such that the conditions and characteristics being studied were robust. More working adults mind wandering studies conducted in daily life are recommended to build knowledge that provides a big picture for understanding the mind wandering episodes of this population.

Lastly, while not a limitation of the study, it is certainly important when comparing one experience sampling study to another to recognize the type of analyses chosen to make sense of the data and the purposes of these analyses. My purpose for frequencies of mind wandering were to generate rates that could be compared to other studies. Therefore, I used participant level and episode level data analyses to determine the frequencies of mind wandering for all, by parent status, and by gender. My purpose for characterizing the mind wandering data was to understand mind wandering episodes. I analyzed episode characteristics using episode level analyses. I focused on the experience itself, what could the moment of mind wandering tell us, not what can we learn about one person's mind wandering. I chose this analysis because daily life is messy, the participant submission rates varied considerably, and so on. I abundantly reminded my readers throughout this dissertation as to the type of analyses I was using for a particular variable or combination of variables.

Recommendations for Future Research

This study was exploratory research. My objective was first to answer my research questions for frequency and characteristics, to develop a starting place for future real life research. My second objective was to open new space and thinking for daily life experience sampling research with working adults. Why working adults in daily life and not more undergraduate students in the lab? My answer was that the field of mind wandering research has been lodged in university conditions and populations for decades. This choice has established our understanding of many aspects of mind wandering. Meanwhile, working people have been kept out of the loop. Even though there have been experience sampling studies, these have consistently used university student samples for the experience sampling portion of the research. These studies are not generalizable to understand mind wandering in the day-to-day life of adults 25–50 or any other age group. Several of my recommendations for future research inform both scholar and practitioner and are provided in a nutshell in Figure 5.1.

Figure 5.1

Recommendations for Further Research
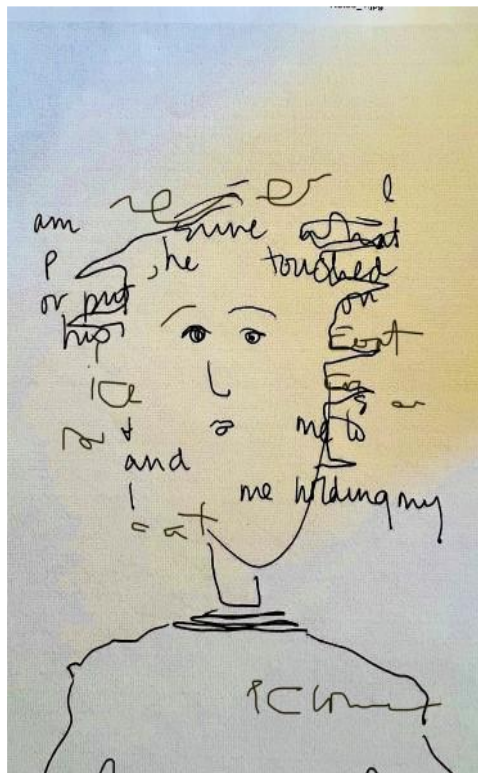
Recommendations for Further Research

- **At workplaces** / how is mind wandering a part of the thinking life of our employees?

- **In meetings** / how is the frequency of mind wandering operable when we gather for shared purpose and task?

- **With coffee, ice cream or beer** / how do the things we consume affect mind wandering in daily life?

- **At home** / how is mind wandering a part of family life?

- **At school** / how is mind wandering a part of the thinking life of our students and/or teachers?

Note: Recommendations for Further Research. Copyright 2022 by Paula C. Lowe

First, I recommend this exploratory research be replicated in workplaces. Yes, participants personal lives would vary, even their jobs within the organization, but these would be part of learning the ways in which mind wandering functions in daily life within workplace contexts. Beyond contributing to the field, this research could have practice-based goals. It could be a means for people within an organization to talk about mind wandering as thinking that we all do. I have presented the history of why we don't speak of mind wandering while at work, at least not so anyone can hear. Yet I am reminded of a day I spent walking the labyrinth and sitting by the water at Oracle's corporate headquarters in Redwood City, California, as I tried to solve a problem. The corporation asked for these spaces to be designed for mind wandering, with walking or sitting being the low demand task, the calm outside being emotionally neutral, the

context being beautiful positive spaces. These kinds of work amenity places and research ache to be united! The only ways to bring mind wandering to the table in organizations is to create safe ways and research to talk about it.

Second, I recommend that my study's findings on the mind wandering of working parents be further explored using experience sampling to learn more about their mind wandering and further, their attitudes about mind wandering. Ko et al. (2020), in their comprehensive review of studies on families and social connectedness, put forth that human social motivation of kin care is the primary motivation for all of us, particularly about caring for children. The authors asked researchers to take on new investigations to better understand how kin care is operable in daily life. To generate a practitioner-level understanding that mind wandering is normal, common, often intentional, and often useful, working parents need experience sampling daily life research conducted with the purpose of shedding light on their experiences.

Finally, here is my short list of five future research recommendations runners up in mind wandering daily life research:

1. **Mind wandering and contextual stimuli:** How has daily life media, environmental stimuli, and the increasingly faster pace of transitions between what we are doing and thinking impacted our mind wandering?

2. **Mind wandering and meetings:** How are working adults mind wandering during meetings in which they must produce work? How about during meetings working adults identity as "not essential" or "just checking in?" How is the frequency of mind wandering operable when we gather for shared purpose and task? This is particularly important because of remote meetings in which participants may have different levels of presence in the meeting.

3. **Mind wandering and coffee, ice cream, or beer:** How are the things we consume related to the mind wandering we do in daily life?

4. **Mind wandering in the daily life of family:** How do parents and children in households experience mind wandering and what are the messages within families about this type of thinking as parents care for and guide their children?

5. **Mind wandering in the daily life of school:** This is not so much a study, but a new venture for research. As an educational psychology researcher, I have long been concerned that children who evidence mind wandering, e.g., a teacher see a child looking out a window at a farmer starting a tractor instead of listening to a lesson, within the school setting may be cautioned about attention deficit issues. ADHD has been well-researched. However, in our quest for desks in rows and bells on the hour and tests, tests, tests, do we have a "normal and ordinary" for children who are mind wandering? If mind wandering is reported over half of the time by working adults, what is that rate with children? Without stigma or intention of diagnosis, we need to investigate this. I will.

Final Mind Wandering Thoughts

A true scientist doesn't perform prescribed experiments; she develops her own and thus generates wholly new knowledge. This transition between doing what you are told and telling yourself what to do generally occurs midway through a dissertation. (Jahren, 2016, p. 66)

I began designing this study in the fall before Covid when I sought to be a contributor to the academic mission of the Antioch Graduate School of Leadership and Change to study, research, and practice leading positive change in workplaces and communities. Wergin (2018) said the scholarship of integration and practice meant researchers like me must ask what our findings mean in the larger context in which respondents participated. The context for this study

was the Covid Pandemic across two years. By March 11, 2022, I was in the middle of data

collection and expected emotional weariness in my participants' responses. But I found out that

they were moving through Covid and uncertainty. They reported mind wandering frequently,

mostly practical thoughts about things that mattered to them. They did not report a lot of worries

and concerns. Nor did they report unhappiness. I saw them looking up, as I too felt and drew in

Figure 5.2. Perhaps they, like me, believed that masks would come off soon.

Figure 5.2

Mind Wandering About My Unmasked Self

Note: Mind Wandering About My Unmasked Self. Copyright 2022 by Paula C. Lowe.

The scholarship of practice took integration even further. Wergin (2018) asked how I

would apply my study's findings to consequential daily life problems, positing that it was an

important contribution of research "to introduce dissonance into existing knowledge perspectives

about what is 'true' or 'universal'" (p. 36). In my view, it is a continuance of this scholarship of

practice to respect how data is collected and how it is given back. I had the privilege of working with a mission-driven small company, Expiwell, as I used their experience sampling smartphone app for my study. Expiwell practiced respect for me as a researcher. I practiced respect for my participants. The creation of research data was a partnership of "maker and taker."

The data that I analyzed were not just numbers in SPSS attached to GPS and time stamps. These were stories told thousands of times by working people I had interrupted to ask, "what are you thinking about right now?" What a bold question. What generosity to answer it. This relationship, this trust between me and a working adult somewhere, means I must give back. First, I will share the results of the study on the website that all participants can revisit. I will then write what we have learned together into a book to make available to all who might be curious about mind wandering in places where we live, learn, and work. I will use that book to generate conversations with those in leadership and change, in schools and workplaces, about mind wandering's relevance to their understanding of people as individuals. I will advocate for mind wandering research to be not just studies concerning brain function, but studies of thinking in real life, messy as that may be, so that millions of working adults can re-imagine mind wandering as common, ordinary, everyday thinking.

Finally, this is what happens when you enter your dissertation. The place where you set down your cup knows you. The pencil you whittle knows you. The screen before you knows you. I have written in circles that have formed a spiral. I would like to end with a mind wandered poem, *bluebird*, forthcoming in my next poetry collection. I include this poem as the last writing in this dissertation because I seek to inspire us to believe "so much of life/is a blue bird's feather/to be seen in a peerless light/at a fork in time."

I thank you for reading this dissertation, whoever you are. I know you have mind wandered, by my estimation, at least a hundred times while you read this research, maybe less if you skimmed it. But I hope when you came to a drawing you paused. That was my mind holding that pen anticipating your glance. I close with *blue bird* in honor of the brains we use every moment of every day.

"Let our brains be planets facing light!"

We are the mind wanderers.

Thank you.

Figure 5.3

blue bird by Paula C. Lowe, 2022

blue bird
        w/ that line from act 4 scene 3 *Julius Caesar* by Shakespeare

by Paula C. Lowe

don't let us die with shiny brains found in autopsies
        when a guy with a big knife opens each of us up
                looking for reusable parts   says   hey
                      this one never turned on this light in here!

we must come to grow into our shoes so we can stand up
        to grave diggers and wedge drivers
                and say to them   true   who knows
                all that can be known

but too   there will be nights   of full moon
        and nights of no moon   for the drone rock orb
                in our black sky plays guide with the tides
                of all men's lives   and could sink our cities in full squabble
                      over soot and guns and lawns
                      if everything under the sun
                      was just about sweat and tears
        and not   equally   about song   about laughter

        because   so much of life   is a blue bird's feather
        to be seen in a peerless light   at a fork in time.

        never say   *can't*

        say   *azure   cobalt   sapphire   indigo*

listen   children are shouting *BLUE*   with crayons in their hands!

        let our brains be planets facing light.

References

Adkins, A. (2021). Millennials: The job-hopping generation. *Gallup Workplace*. https://gallup.com/workplace/231587/millennials-job-hopping-generation.aspx

Agnoli, S., Vannucci, M., Pelagatti, C., & Corazza, G. E. (2018). Exploring the link between mind wandering, mindfulness, and creativity: A multidimensional approach. *Creativity Research Journal*, *30*(1), 41–53. https://doi.org/10.1080/10400419.2018.1411423

Allen, T. D., Cho, E., & Meier, L. L. (2014) Work-family boundary dynamics. *Annual Review of Organizational Psychology and Organizational Behavior*, *1*, 99–121. https://doi.org/10.1146/annurev-orgpsych-031413-091330

Andrews-Hanna, J. R., Kaiser, R. H., Turner, A. E. J., Reineberg, A. E., Godinez, D., Dimidjian, S., & Banich, M. T. (2013). A penny for your thoughts: Dimensions of self-generated thought content and relationships with individual differences in emotional wellbeing. *Frontiers in Psychology*, *4*, Article 900. https://doi.org/10.3389/fpsyg.2013.00900

Andrews-Hanna, J. R., Reidler, J. S., Huang, C., & Buckner, R. L. (2010). Evidence for the default network's role in spontaneous cognition. *Journal of Neurophysiology*, *104*(1), 322–335. https://doi.org/10.1152/jn.00830.2009

Antrobus, J. S., Singer, J. L., & Greenberg, S. (1966). Studies in the stream of consciousness: Experimental enhancement and suppression of spontaneous cognitive processes. *Perceptual and Motor Skills*, *23*(2), 399–417. https://doi.org/10.2466/pms.1966.23.2.399

Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *Academy of Management Review*, *25*(3), 472–491. https://doi.org/10.5465/amr.2000.3363315

Ashforth, B.E., Kulik, C. T., & Tomiuk, M. A. (2008). How service agents manage the persona–role interface. *Group & Organization Management*, *3*(1), 5–45. https://doi.org/10.1177/1059601106293723

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*(10), 1117–1122. https://doi.org/10.1177/0956797612446024

Bandura, A. (1986). *Social foundations of thought & action: A social cognitive theory*. Prentice-Hall.

Barroso, A., Parker, K., & Bennett, J. (2020). *As Millennials near 40, they're approaching family life differently than previous generations.* Pew Research Center. https://www.pewresearch.org/social-trends/wp-content/uploads/sites/3/2020/05/PDST_05.27.20_millennial.families_fullreport.pdf https://www.pewresearch.org/social-trends/2020/05/27/as-millennials-near-40-theyre-approaching-family-life-differently-than-previous-generations/

Bulger, E. A., Matthews, R. A., & Hoffman, M. E. (2007). Work and personal life boundary management: Boundary strength, work/personal life balance, and the segmentation-integration continuum. *Journal of Occupational Health Psychology*, *12*(4), 365–375. https://doi.org/10.1037/1076-8998.12.4.365

Cartreine, J. (2016). More than sad: Depression affects your ability to think. *Harvard Health Blog*. https://www.health.harvard.edu/blog/sad-depression-affects-ability-think-201605069551

Christensen, T. C., Barrett, L. F., Bliss-Moreau, E., Lebo, K., & Kaschub, C. (2003). A practical guide to experience-sampling procedures. *Journal of Happiness Studies*, *4*(1), 53–78. https://doi.org/10.1023/a:1023609306024

Christoff, K., Irving, Z. C., Fox, K. C. R., Spreng, R. N., & Andrews-Hanna, J. R. (2016). Mind-wandering as spontaneous thought: A dynamic framework. *Nature Reviews Neuroscience*, *17*, 718–731. https://doi.org/10.1038/nrn.2016.113

Christoff, K., Mills, C., Andrews-Hanna, J. R., Iriving, Z. C., Thompson, E., Fox, K. C. R,, & Kam, J. Y. W. (2018). Mind wandering as a scientific concept: Cutting through the definitional haze. *Trends in Cognitive Sciences*, *22(*11), 957–959. https://doi.org/10.1016/j.tics.2018.07.004

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*(6), 641–651. https://doi.org/10.1177/1948550616678455

Copeland, L. (2017). *Why mind wandering can be so miserable, according to happiness experts.* Smithsonian Magazine. https://www.smithsonianmag.com/science-nature/why-mind-wandering-can-be-so-miserable-according-happiness-experts-180962265/

Damasio, A. (2010). *Self comes to mind: Constructing the conscious brain.* Vintage Books.

Dane, E. (2018). Where is my mind? Theorizing mind wandering and its performance-related consequences in organizations. *Academy of Management Review*, *43*(2), 179–197. https://doi.org/10.5465/amr.2015.0196

Des Georges, C. (2019, February 15). *What's normal? Americans' personal habits at home and at work.* Survey Monkey. https://www.surveymonkey.com/curiosity/personal-habits-at-work-and-home/

Ekman, P. (1993). Facial expression and emotion. *American Psychologist, 48*(4), 384–392. https://doi.org/10.1037/0003-066X.48.4.384

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1, 1–4. https://doi.org/10.11648/j.ajtas.20160501.11

Faber, M., Radvansky, G. A., & D'Mello, S. K. (2018). Driven to distraction: A lack of change gives rise to mind wandering. *Cognition*, *173*, 133–137. https://doi.org/10.1016/j.cognition.2018.01.007

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

Fry, R. (2018). *Millennials are the largest generation in the U. S. labor force.* Fact Tank. Retrieved January 21, 2021 from https://www.pewresearch.org/fact-tank-2018/4/11/millennials-largest-generation-us-labor-force/

Giambra, L. M. (1989). Task-unrelated-thought frequency as a function of age: A laboratory study. *Psychology and Aging*, *4*(2), 136–143. https://doi.org/10.1037/0882-7974.4.2.136

Golchert, J., Smallwood, J., Jefferies, E., Seli, P., Huntenburg, J. M., Liem, F., Lauckner, M. E., Oligschläger, S. Bernhardt, B. C., Villringer, A., & Margulies, D. S. (2017). Individual variation in intentionality in the mind-wandering state is reflected in the integration of the default-mode, fronto-parietal, and limbic networks. *NeuroImage*, *146*, 226–235. https://doi.org/10.1016/j.neuroimage.2016.11.025

Hill, P. T., & Destler, K. (2022, May 13). *Restoring pandemic losses will require major changes in schools and classrooms, superintendents say.* Brookings. https://www.brookings.edu/blog/brown-center-chalkboard/2022/05/13/restoring-pandemic-losses-will-require-major-changes-in-schools-and-classrooms-superintendents-say/

Irving, Z. C. (2016a). Mind-wandering is unguided attention: Accounting for the "purposeful" wanderer. *Philosophical Studies*, *173*(2), 547–571. https://doi.org/10.1007/s11098-015-0506-1

Irving, Z. C. (2016b). *The wandering mind: A philosophical study of thinking*. (Publication No. 10139107) [Doctoral dissertation, University of Toronto]. ProQuest Dissertations.

Irving, Z. C., Glasser, A., Gopnik, A., Pinter, V., & Sripada, C. (2020). What does "mind-wandering" mean to the folk? An empirical investigation. *Cognitive Science*, *44*(10), Article e12908. https://doi.org/10.1111/cogs.12908

Jahren, H., (2016). Roots and leaves. In *Lab Girl.* Alfred A. Knopf.

Kane, M. J., Brown, L. H., McVay, J. C., Silvia, P. J., Myin-Germeys, I., & Kwapil, T. R. (2007). For whom the mind wanders, and when. *Psychological Science*, *18*(7), 614–621. https://doi.org/10.1111/j.1467-9280.2007.01948.x

Kane, M. J., Gross, G. M., Chun, C. A., Smeekens, B. A., Meier, M. E., Silvia, P. J., & Kwapil, T. R. (2017). For whom the mind wanders, and when, varies across laboratory and daily-life settings. *Psychological Science*, *28*(9), 1271–1289. https://doi.org/10.1177/0956797617706086

Kegan, R. (1982). *The evolving self.* Harvard Press.

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

Klinger, E. (1971). Structure and functions of fantasy. In *Structure and functions of fantasy.* Wiley-Interscience.

Klinger, E. (1975). Consequences of commitment to and disengagement from incentives. *Psychological Review*, *82*(1), 1–25. https://doi.org/10.1037/h0076171

Klinger, E., & Cox, W. M. (1987). Dimensions of thought flow in everyday life. *Imagination, Cognition and Personality*, *7*(2), 105–128. https://doi.org/10.2190/7k24-g343-mtqw-115v

Ko, A., Pick, C. M., Kwon, J. Y., Barlev, M., Krems, J. A., Varnum, M. E. W., Neel, R., Peysha, M., Boonyasiriwat, W., Brandstätter, E., Crispim, A. C., Cruz, J. E., David, D., David, O. A., de Felipe, R. P., Fetvadjiev, V. H., Fischer, R., Galdi, S., Galindo, O., … Kenrick, D. T. (2020). Family matters: Rethinking the psychology of human social motivation. *Perspectives on Psychological Science*, *15*(1), 173–201. https://doi.org/10.1177/1745691619872986

LaMotte, S. (2020). *Parents and other caregivers are more stressed and in poorer health due to pandemic, report finds.* CNN Health. https://www.cnn.com/2020/09/09/health/caregiver-stress-covid-19-wellness/index.html

Linz, R., Pauly, R., Smallwood, J., & Engert, V. (2021,). Mind-wandering content differentially translates from lab to daily life and relates to subjective stress experience. *Psychological Research*, *85*, 649–659. https://doi.org/10.1007/s00426-019-01275-2

McCormick, C., Rosenthal, C. R., Miller, T. D., & Maguire, E. A. (2018). Mind-wandering in people with hippocampal damage. *Journal of Neuroscience*, *38*(11), 2745–2754. https://doi.org/10.1523/JNEUROSCI.1812-17.2018

McMillan, R. L., Kaufman, S. B., & Singer, J. L. (2013). Ode to positive constructive daydreaming. *Frontiers in Psychology*, *4*, Article 626. https://doi.org/10.3389/fpsyg.2013.00626

McVay, J. C., Kane, M. J., & Kwapil, T. R. (2009). Tracking the train of thought from the laboratory into everyday life: An experience-sampling study of mind wandering across controlled and ecological contexts. *Psychonomic Bulletin and Review*, *16*(5), 857–863. https://doi.org/10.3758/pbr.16.5.857

Miller, C. C., (2020). *Three things lockdowns have exposed about working and parenting.* The New York Times. https://www.nytimes.com/2020/04/27/upshot/coronavirus-exposes-workplace-truths.html

Mills, C., Raffaelli, Q., Irving, Z. C., Stan, D., & Christoff, K. (2018). Is an off-task mind a freely-moving mind? Examining the relationship between different dimensions of thought. *Consciousness and Cognition*, *58*, 20–33. https://doi.org/10.1016/j.concog.2017.10.003

Minsky, M. (2014). *The society of the mind. In Essays and reviews*. Princeton University Press. (Original work published 1986). https://doi.org/10.1515/9781400848393-056

Murray, S., & Krasich, K. (2020). Can the mind wander intentionally? *Mind and Language*, *37*(3), 432–443. https://doi.org/10.1111/mila.12332

Murray, S., Krasich, K., Schooler, J. W., & Seli, P. (2020). What's in a task? Complications in the study of the task-unrelated-thought variety of mind wandering. *Perspectives on Psychological Science*, *15*(3), 572–588. https://doi.org/10.1177/1745691619897966

Papert, S. (1980). *Mindstorms.* Basic Books.

Park, Y. S., Konge, L., & Artino, A. R. (2020). The positivism paradigm of research. *Academic Medicine*, *95*(5), 690–694. https://doi.org/10.1097/ACM.0000000000003093

Poerio, G. L., Totterdell, P., Emerson, L. M., & Miles, E. (2015). Love is the triumph of the imagination: Daydreams about significant others are associated with increased happiness, love and connection. *Consciousness and Cognition*, *33*, 135–144. https://doi.org/10.1016/j.concog.2014.12.011

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

Pollan, M. (2018). *How to change your mind.* Penguin Press.

Prabhakaran, S. (2019). *Mahalanobis distance—Understanding the math with examples*. https://www.machinelearningplus.com/statistics/mahalanobis-distance/

Price, J. (2017). *A brief history of productivity: How getting stuff done became an industry*. https://jimmypriceblogger.wordpress.com/2017/01/30/a-brief-history-of-productivity-how-getting-stuff-done-became-an-industry/

Protzko, J., Zedelius, C. M., & Schooler, J. W. (2019). Rushing to appear virtuous: Time pressure increases socially desirable responding. *Psychological Science*, *30*(11), 1584–1591. https://doi.org/10.1177/0956797619867939

Prudential Newsroom. (October 2021). *Building the future of work requires skill training, flexibility*. https://news.prudential.com/building-future-work-requires-skills-training-flexibility.htm

Puddicombe, A. (2013). *All it takes is 10 mindful minutes*. YouTube. https://www.youtube.com/watch?v=qzR62JJCMBQ

Pujol, J., Vendrell, P., Junqué, C., Martí-Vilalta, J. L., & Capdevila, A. (1993). When does human brain development end? Evidence of corpus callosum growth up to adulthood. *Neurology*, *34*(1), 71–75. https://doi.org/10.1002/ana.410340113

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

Robison, M. K., Miller, A. L., & Unsworth, N. (2019). Examining the effects of probe frequency, response options, and framing within the thought-probe method. *Behavior Research Methods*, *51*(1), 398–408. https://doi.org/10.3758/s13428-019-01212-6

Santhanam, L. (2020). *"This is not working." Parents juggling jobs and childcare under COVID-19 see no good solutions*. PBS Newshour. https://www.pbs.org/newshour/health/this-is-not-working-parents-juggling-jobs-and-child-care-under-covid-19-see-no-good-solutions.

Schwartz-Shea, P., & Yanow, D. (2012). Starting from meaning. *Interpretive Research Design: Concepts and Processes*. Routledge. https://doi.org/10.4324/9780203854907

Seli, P., Carriere, J. S. A., Levene, M., & Smilek, D. (2013). How few and far between? Examining the effects of probe rate on self-reported mind wandering. *Frontiers in Psychology*, *4*, Article 430. https://doi.org/10.3389/fpsyg.2013.00430

Seli, P., Carriere, J. S. A., & Smilek, D. (2015). Not all mind wandering is created equal: dissociating deliberate from spontaneous mind wandering. *Psychological Research*, *79*(5), 750–758. https://doi.org/10.1007/s00426-014-0617-x

Seli, P., Carriere, J. S. A., Wammes, J. D., Risko, E. F., Schacter, D. L., & Smilek, D. (2018a). On the clock: Evidence for the rapid and strategic modulation of mind wandering. *Psychological Science*, *29*(8), 1247–1256. https://doi.org/10.1177/0956797618761039

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

Seli, P., Ralph, B. C. W., Konishi, M., Smilek, D., & Schacter, D. L. (2017a). What did you have in mind? Examining the content of intentional and unintentional types of mind wandering. *Consciousness and Cognition*, *51*, 149–156. https://doi.org/10.1016/J.CONCOG.2017.03.007

Seli, P., Ralph, B. C. W., Risko, E. F., W. Schooler, J., Schacter, D. L., & Smilek, D. (2017b). Intentionality and meta-awareness of mind wandering: Are they one and the same, or distinct dimensions? *Psychonomic Bulletin and Review*, *24*(6), 1808–1818. https://doi.org/10.3758/s13423-017-1249-0

Seli, P., Risko, E. F., & Smilek, D. (2016a). On the necessity of distinguishing between unintentional and intentional mind wandering. *Psychological Science*, *27*(5), 685–691. https://doi.org/10.1177/0956797616634068

Seli, P., Risko, E. F., Smilek, D., & Schacter, D. L. (2016b). Mind-wandering with and without intention. *Trends in Cognitive Sciences*, *20*(8), 605–617. https://doi.org/10.1016/j.tics.2016.05.010

Singer, J. L. (1975). Navigating the stream of consciousness research in daydreaming and related inner experience. *American Psychologist*, *30*(7), 727–738. https://doi.org/10.1037/h0076928

Smallwood, J., & Andrews-Hanna, J. (2013). Not all minds that wander are lost: The importance of a balanced perspective on the mind-wandering state. *Frontiers in Psychology*, *4*, Article 441. https://doi.org/10.3389/fpsyg.2013.00441

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

Smallwood, J., Schooler, J. W., Turk, D. J., Cunningham, S. J., Burns, P., & Macrae, C. N. (2011). Self-reflection and the temporal focus of the wandering mind. *Consciousness and Cognition*, *20*(4), 1120–1126. https://doi.org/10.1016/j.concog.2010.12.017

Smeekens, B. A., & Kane, M. J. (2016). Working memory capacity, mind wandering, and creative cognition: An individual-differences investigation into the benefits of controlled versus spontaneous thought. *Psychology of Aesthetics, Creativity, and the Arts*, *10*(4), 389–415. https://doi.org/10.1037/aca0000046

Smith, G. K., Mills, C., Paxton, A., & Christoff, K. (2018). Mind-wandering rates fluctuate across the day: Evidence from an experience-sampling study. *Cognitive Research: Principles and Implications*, *3*(1), Article 54. https://doi.org/10.1186/s41235-018-0141-4

Tappe, A. (2020). A shocking number of women dropped out of the workforce last month. *CNN* Business, October 8, 2020. https://www.cnn.com/2020/10/07/economy/women-workforce-coronavirus/index.html

Tappe, A. (2021). *For parents returning to the office this summer, childcare is still a major issue*. CNN Business, May 19, 2021. https://www.cnn.com/2021/05/19/economy/parents-office-return-child-care/index.html

Van Dam, A. (2020). The unluckiest generation in U. S. history. *The Washington Post*. https://www.washingtonpost.com/business/2020/05/27/millennial-recession-covid/

Vannucci, M., Pelagatti, C., & Marhetti, I. (2017). Manipulating cues in mind wandering: Verbal cues affect the frequency and the temporal focus of mind wandering. *Consciousness and Cognition*, *53*, 61–69. http://dx.doi.org/10.1016/j.concog.2017.06.004

Varao-Sousa, T. L., & Kingstone, A. (2019). Are mind wandering rates an artifact of the probe-caught method? Using self-caught mind wandering in the classroom to test, and reject, this possibility. *Behavior Research Methods*, *51*(1), 235–242. https://doi.org/10.3758/s13428-018-1073-0

Wallas, G. (1926). *The art of thought.* Jonathan Cape Publisher.

Weinstein, Y., De Lima, H. J., & van der Zee, T. (2018). Are you mind-wandering, or is your mind on task? The effect of probe framing on mind-wandering reports. *Psychonomic Bulletin and Review*, *25*(2), 754–760. https://doi.org/10.3758/s13423-017-1322-8

Wergin, J. (2018). Chapter 2: Finding the right design for EDI research. In L. A. E. Booysen, R. Bendi, & J. K. Pringle (Eds.), *Handbook of research methods in diversity management, equality, and inclusion at work* (pp. 36–59). Edward Elgar. https://doi.org/10.4337/9781783476084.00010

Wergin, J. (2020). *Deep learning in a disorienting world*. Cambridge University Press. https://doi.org/10.1017/9781108647786

Whitehead, A. N. (1938). *Models of thought*. MacMillan Company.

Wiemers, E. A., & Redick, T. S. (2019). The influence of thought probes on performance: Does the mind wander more if you ask it? *Psychonomic Bulletin and Review*, *26*(1), 367–373. https://doi.org/10.3758/s13423-018-1529-3

Zedelius, C. M., Broadway, J. M., & Schooler, J. W. (2015). Motivating meta-awareness of mind wandering: A way to catch the mind in flight? *Consciousness and Cognition*, *36*, 44–53. https://doi.org/10.1016/j.concog.2015.05.016

Zedelius, C. M., & Schooler, J. W. (2017). What are people's lay theories about mind wandering and how do those beliefs affect them? In *The science of lay theories: How beliefs shape our cognition, behavior, and health* (pp. 71–93). Springer International Publishing. https://doi.org/10.1007/978-3-319-57306-9_4

Zedelius, C. M., & Schooler, J. W. (2018). Unraveling what's on our minds: How different types of mind-wandering affect cognition and behavior. In *The Oxford handbook of spontaneous thought: Mind-wandering, creativity, and dreaming* (pp. 233–248). Oxford Academic. https://doi.org/10.1093/oxfordhb/9780190464745.013.29

Appendix

APPENDIX A: EMAIL INVITATIONS STUDY FLYER (POST STUDY)

Mind Wandering in Daily Life: Experience Sampling Study for Working Adults Ages 25-50
Living in the United States (complete details at www.paulaclowe.com)

Who was in this study: Adults ages 25-50 working and living in
the United States (GPS USA when participating in the study)
What was this study about: mind wandering in daily life
How did this study work: uses a smartphone app to notify
participant to answer quick questions six times a day for up to five
days. The questions take about a minute each time.
Who was the researcher: Paula C. Lowe, doctoral student, Antioch
University Graduate School in Leadership and Change.

To participate in this study, participants had to:
- Install the free Expiwell sampling app on your smartphone
  (at smartphone play store).
- Open the app, type in the study code and your email.
- Onboard the study by giving informed consent and completing the profile survey.
- Choose start day.
- When notified, go to the Expiwell app and complete a mind wandering survey.
- Submit at least 20 surveys to be paid.
- Leave the study at any time.

What is Mind Wandering? Mind wandering is a common and normal type of thinking. It happens when
we think thoughts that are not about what we are doing. Maybe you were on your computer and suddenly
thought about a movie. **What is NOT Mind Wandering?** Not mind wandering is common and normal
too. It happens when we think thoughts that ARE about what we are doing. Maybe you were making
dinner and thinking about making dinner. **Common Thinking:** Our minds go between these two types of
thinking all day every day, sometimes mind wandering, sometimes not mind wandering. And sometimes
because we "are open to" mind wandering and sometimes because mind wandering "pops up."

Confidentiality Your participation was voluntary and anonymous. Any information you provided was
only for approved research purposes.

RISKS & BENEFITS It was unlikely this study caused harm. Your participation may have interested
you and increased your awareness of your thinking. You were contributing to understanding how working
adults experience mind wandering in daily life.

PAYMENT & THANK YOU! For participants who completed onboarding, submitted at least 20
sampling surveys, and reported USA GPS, you were paid $10 Amazon e-gift card per website pay dates.

APPENDIX B: MIND WANDERING STUDY WEBSITE HOMEPAGE

www.paulaclowe.com

Note: Copyright Paula C. Lowe, 2022.

APPENDIX C: MIND WANDERING STUDY SOCIAL MEDIA ADS

Note: Copyright Paula C. Lowe, 2022.

APPENDIX D: MIND WANDERING STUDY LOGO

www.paulaclowe.com

Note: Copyright Paula C. Lowe, 2022.

APPENDIX E: MIND WANDERING STUDY WEBSITE

(excerpted and revised post study)

**Mind Wandering in Daily Life Study: Experience Sampling
Adults 25-50 Years of Age Living and Working in the USA**

BIG THANKS to all who completed thousands of 1-minute surveys to generate a robust, diverse, incredible national study! Thank you for sharing moments in your lives!

PAYMENTS to all qualifying USA (verified by GPS) participants who "Onboarded + 20 out of 30 COMPLETES" were paid. If you qualified for payment, you followed the payment instructions below to redeem your e-card. The #1 payment problem was solved when participants refreshed the Expiwell app screen to show the balance with today's date.

Reasons NOT to be paid: Your phone GPS located you in a country other than USA during the study. You did not submit your ONBOARDING SURVEY to agree to be in the study. You submitted LESS THAN 20 out of 30 1-minute surveys.

STUDY HOW TO'S

Self-Screen I'm 25-50 years of age, living & working in the United States. I'm okay with a phone app notifying me to take 1-minute surveys for a few days. I understand "complete" means I submit 20 out of 30 1-minute surveys if I want the $10 Amazon e-card.

Set Up the App

Installed FREE study app on smartphone. Available **Apple** Store or **Android** Google Play Store.

Opened app, entered your email, created a password.

Typed in ACCESS CODE

Pressed LOWE MIND WANDERING. ONBOARDING & Mind Wandering Survey.

Picked a start date.

Set Up Notifications

Smartphone **Settings** > **Notifications** > allow app notifications.

Adjusted Focus settings: Go to **Settings** > **Focus** > allow app notifications in work or personal mode during study.

Optimized Phone: Volume up. Near to hear. Vibrate on. Face up for banners. Turn off Airplane or Silence Mode. If your phone was quirky with notification sounds & you have done everything to fix, you kept your phone faceup with you during study. (This happened to me too.)

Do Study

Day 1: ONBOARDED using app. (takes 2-3 minutes).

Day 2-6: RESPONDED to notifications at 6 random times between 9am - 8pm. ONLY 6 1-minute surveys (6 minutes per day).

- o   Each time notified, 15-minute window to complete a 1-minute survey.

- o   Calendar showed scheduled, completed & missed surveys.

- o   Goal **20 out of 30** surveys. Can miss 10 & still make goal of 20 out of 30.

- o   *Expiwell app on your phone until redeem $10 through the app.*

Get Paid

To receive $10 e-card for completing the study, submitted onboarding & 20+ 1-minute surveys.

If you onboarded & completed 20+ surveys, check app for status of your $10 e-card:

- o   Opened app. On homepage, pressed "balloon" in upper left.

- o   Pressed "Settings." Pressed "My Balance." When balance $10.00, pressed "redeem." If the $10.00 doesn't show up, **refresh the screen** by pulling it down gently. You will see the refresh flower at the top spinning. Then let go after a few seconds and you should see your balance and today's date of your balance.

- o   Exit app & log into the email account associated with your app account.

- o   You will receive an email confirmation with the gift card claim code. Use this code in you're A. account to redeem your gift e-card.

- o   After you hit "redeem" you will wait a little to get the email, but if you do not see this email in your inbox, check spam.

- o   If you uninstalled the app, no worries, just reinstall with "Set up the App" directions above. Then follow the "How to Get Paid" instructions.

- o   If you don't see a balance by the end of that week, **refresh the balance screen** as described above. You can also refresh your app by closing and opening the app & then go back.

- o   *THANK YOU for being part of this national research! THANK YOU for your kindness and your patience. You have contributed to new knowledge about thinking!*

Smartphone Settings for This Study

Allow Notifications: in smartphone Settings > Notifications > allow app notifications.

Adjust Focus settings: Go to **Settings** > Focus > allow Expiwell app notifications so you can still get notifications during focus/silence modes.

Turn Volume up. Add vibrate if you have phone in purse or pocket.

Keep phone "near to hear" notifications**.**

Using Airplane or **Do Not Disturb** or Silence mode blocked notifications.

Move app icon to home screen during study.

**If you get stuck, go to FAQs.

About Study

This study used experience sampling to learn about the ways working people mind wander in daily life. Mind wandering is a natural & common type of thinking we do every day. It's when we think about things that are not about what we are doing. Sometimes these thoughts pop up. Other times we are open to them. Over the past twenty-five years, researchers have claimed that we mind wander somewhere between 30% - 50% of the time during our waking hours. But most studies have been conducted in universities with university students. What do we know about the mind wandering of working adults in daily life? This study includes **adults ages 25-50 living and working in the United States** who take care of families, pay bills, contribute to teams, make deadlines, help people heal, all of this and more. Paid or unpaid! Perhaps a participant works for a heating company as a kind and thorough repair person (shout out to Edgar) or work in a hospital helping people regain their confidence to move (thank you Jessica). You might be a family therapist (grateful to Sunny) or getting building supplies to their destinations (hooray Crystal). I am grateful for each of you who choose to join this study!

8 quick easy questions

This was an experience sampling study. Participants answered **8 quick easy questions** (less than 1-minute) at 6 random times each day about their mind wandering.

1. mind wandering, yes or no, 2. open to mind wandering or thoughts just popped up, 3. mostly about day-to-day or other choices, 4. thoughts related to work, children, or other choices, 5. mostly about past, present, or other choices, 6. related to work, children, or other choices, 7. what I was doing, 8. how I was feeling, 9 . any comments I want to add about the experience. HIT DONE!

about mind wandering

Mind wandering is a natural & common type of thinking we do every day. It's when we think about things that are not about what we are doing. Sometimes these thoughts pop up. Other times we are open to them. We can mind wander about the past, future, present or maybe the thought didn't happen at all. We might mind wander about day-to-day things, interesting experiences, problem solving ideas, or concerns. We might mind wander about family or friends, our kids, someone we met. Maybe we mind wander about things that matter to us personally, like a vacation or new job or a football game or meeting. WE MIND WANDER**.** That is what connects all of these seemingly disconnected thoughts! These are our thoughts! These come out of our lives!
When does mind wandering happen? Perhaps while answering emails. Or installing a refrigerator. Or picking up kids at daycare. Or waiting for a bus. Suddenly, a thought appears that is not about what we are doing. We mind wander at any time during any activity in any place.

You might wonder, what if I am working and suddenly mind wander about checking my phone and then I go to my phone and start doing that? Is the thought about my connecting with someone or something on my phone "mind wandering"?" Yes. It came out of the blue. You suddenly wondered if someone texted you, if an event happened, if you need to get home. In other words, you mind wandered a thought about using your phone to check in on your life.

Mind wandering doesn't happen to us. WE MIND WANDER!

Mind Wandering Definitions

MIND WANDERING: when you think about things that ARE NOT about what you are doing. Maybe you were on your computer & suddenly thought about a movie.

NOT MIND WANDERING: when you think about things that ARE about what you are doing. Maybe you were serving food at a restaurant and thought about checking on the next table's order.

INTENTIONAL MIND WANDERING: when you mind wander because you are **open to other thoughts.** This might happen in low demand tasks such as driving, washing dishes, or relaxing or anytime.

UNINTENTIONAL MIND WANDERING: when you mind wander because other **thoughts pop up.** This might happen during demanding tasks such as concentrating on mental or physical work or anytime.

Frequently Asked Questions

Who could be in this study?

Working adults ages 25 - 50 who live and work in the United States as indicated on GPS. If a participant joined the study and answered surveys off-line, the participant's current local time was used to check location so that the study only included a United States sample.

How much time did it take to do this study?

DAY 1: ONBOARDING: 2-3 minutes

DAYS 2-6: MIND WANDERING QUICK SURVEYS: 1-minute per notification, 6 notifications per day = 6 minutes per day. If you want to complete the study for the $10 Amazon e-card, you submitted 20 out of 30 1-minute surveys.

What 8 quick questions were asked about mind wandering?

1. when notified, I was mind wandering? yes or no. 2. open to mind wandering or thoughts popped up? 3. was mostly about day-to-day or other choices? 4. thoughts related to work, children, or other choices? 5. mostly about past, present, or other choices? 6. related to work, children, or other choices? 7. what I was doing? 8. how I was feeling? 9. any comments I want to add about the experience. HIT DONE!

What if I can only do a few days in the study?

Participants chose how many days to be in the study up to 5 days. Your choice. To complete for the $10 Amazon e-card, each had to have a USA GPS and submit 20 out of 30 1-minute surveys in 4-5 days.

To get into the flow of your mind wandering — starting to see your own times and places, your own feelings and content — I recommended participants stay in the study at least three days. The first day is new. On the next days, you learn things about when and how you mind wander.

How do I get out of the study when I want to leave?

To exit the study at any time, participants submitted their last experience. If uninterested in getting paid, they uninstalled the app. If getting paid, read next question.

How do I get paid?

Must have completed 20 out of 30 1-minute surveys. To redeem $10 e-card: Open app. On homepage, press balloon in upper left. Press "Settings." Press "My Balance." When balance is $10.00, press "redeem a gift card." Your code will be emailed to the email account associated with this study. Check your spam if not in inbox. Email will show up in 1-2 weeks from the day you completed.

What if I want to start over?

If you missed too many notifications or goofed in your setup to reach your goal of 20 completed surveys, do this: On app homepage. Press "Lowe Mind Wandering," then the "remove" shows up. Press it. Now press "+" to add the study & type in the access code. Start new. Have app notifications allowed, keep phone face up, volume up & with you.

I'm not receiving app notifications on my smartphone. Why?

Go to Settings > **Notifications** > **apps. Allow app notifications.** Move button beside Expiwell app to ON.

Go to Settings > **Focus** > then the modes like work, personal, etc. Allow Expiwell notifications.

Most added apps don't need notifications. Expiwell's app sends out notifications so you can participate. Allow notifications. Allow banners. Keep your smartphone "near to hear" notifications! If your phone is set to Airplane Mode or Do Not Disturb or Silence Mode you will not receive notifications. Make sure you do not accidentally have your phone in a silence mode. And turn up the volume on your ringer/notifications. If you use iOS focus mode, go to settings, and allow app to notify you in this setting. You can change it back after the study. If all else fails, keep your phone with you at all times during the study. Keep it face up and you will see the app banner when a notification is ready.

I couldn't get into the app with access code mind22. Why?

It's important to **TYPE IN** the access code. Don't paste it.

How do I get the start date to be today?

When you are on the rolling calendar to pick a start date on the app, roll past today's date, and roll back to it. The app will then let you pick today's date.

The app has "Current" and "Discover." Which one do I choose?

Use "Current." Discover is not related to this study.

What if I hear a notification but can't answer it?

You will have a window of 15 minutes to answer a notification. But if you still can't respond, don't worry. You have 30 times to get to 20 completes. Use the calendar window to see what the time frames are. Just look forward to the next notification and have fun with the questions!

What if I want to say more about my mind wandering experience?

The last question in the mind wandering survey asks if you want to say more about your experience. Type in a few words or more as you want. It's all good.

How long was this study going on?

First four months of 2022. While having kids or a physically active job or deadlines or being sick can make it hard to participate, I hope that you choose to be in this study because your experiences matter. These are your truths. It's okay to be in the study for just two days if that is all you have. Seize the fun!

ABOUT THIS STUDY

Why does it matter if someone is mind wandering or not?

Mind wandering is common and normal for each of us. We need some mind wandering in our lives. Many studies report that we mind than 30%-50% of our waking hours. Even though that seems like a lot, and you might be thinking, whoa, that is totally off-task thinking … imagine that you only thought about the thing in front of you! Imagine that you couldn't think about the past or the future because these were beyond the task at hand! Our minds evolved to mind wander, and mind wandering is a source of how we connect with other people, times, places, ideas, concerns, all of it. This study wants to learn about the ways we mind wander because these findings will help us understand the benefits as well as the interruptions we experience when we mind wander.

What are you going to do with the responses from this study?

This study was my research for my PhD in leadership and change. I have been studying and writing about mind wandering for several years. This study has been an opportunity to hear from working people across the United States. Are we mind wandering? Are we thinking of ordinary things or concerns? Are we super busy or in low demand when we mind wander? I analyzed thousands of responses to learn about mind wandering.

CONFIDENTIALITY

Participation was voluntary & anonymous. Participants did not provide any personally identifying data. Any information provided was only for approved research purposes.

There have been many big stresses affecting each of us this year. Covid, work issues, inflation, gas prices, war in Ukraine & many personal concerns have been on our minds. I sincerely appreciate that you were willing to participate in a study about mind wandering while you may have had a lot on your mind. Thank you!

RESEARCHER

Paula C. Lowe now holds a PhD from Antioch University, Graduate School in Leadership & Change. She is an educational psychology researcher, poet & artist. She often mind wanders. She is the author of *CarePooling, HomeWorks &* other books & publications for working families. Her poetry books include *MOO* (finalist for the International Book Award in Poetry, 2015), *Poems For Endangered Places*, and dozens of poems in various journals and anthologies.

INSTITUTIONAL REVIEW

This study was approved for human subject research by an institutional review board. For specific research participation concerns not addressed by this website, go to the website contact page.

APPENDIX F: RECOMMENDATIONS FOR WEBSITE-DRIVEN EXPERIENCE SAMPLING STUDY USING A SMARTPHONE APP

       Design your study logo and homepage to create a recognizable brand for your study. This helps you recruit and gives a professional look to your work. Doing an experience sampling study with a national recruited sample using Facebook Ads has the following considerations.

A) **Participants do not attend a shared orientation.** This is good for quality of data as none of the participants know who the other participants are. They are focused only on their own participation. However, it means that every message must be to the point.

B) **Short attention span.** The average time on the study website *How to Page* was three minutes so that the page had to teach without fatigue or discouragement. I learned what to fix by reading participant comments and paying attention to the data coming in and completion rates as to what to add and subtract to get results.

C) **Using training videos is an option but again, short attention span.** Ask, do I need this? As my study was already underway at the time I built my website, I chose not to add videos. My Squarespace analytics data documented that visitors went to one page, *How to Participate*, for roughly three minutes before onboarding. Website visitors would not watch videos. Any extra step was an impediment to participation.

D) **Having the Website directions works for those who join the study as they can refer to these over and over.** Videos tend to not be as good at this although the participant could stop the video at the points of interest. My concern was not over doing orientation such that biases crept in. I wanted to work with a naïve sample who came to the study in isolation from me and each other. Note about translation: written directions allowed participants to apply to their smartphones and if they had a problem, they emailed me.

E) **Website was continuously improved.** Over the course of data collection, the website was continually improved, and because there was email contact opportunity, it was easy to respond to problems with participation.

F) **Put energy into completes.** As data collection continued and the rates of desired completion improved, I put energy into working with the completes, i.e., paying them, and accepting that there was a certain drop off rate for participation due to factors specific to the participant and his/her phone and situation. This was why participants were given up to five days to be in the study.

G) **The Facebook incentivized ads drove a high response to the website.** I learned that the website How-to page needed "self-screen" at the top so that the visitor understood if she/he qualified for the study and what he/she was signing up for. For example, I had 5% of website visitors coming from other countries. I made it clear in the ads, website homepage, and self-screen that the study was for adults 25-50 working and living in the

United States. This does not preclude those of other nationalities or citizenships, but their circumstances and ages needed to meet this requirement for participation. The experience sampling app that I used attached GPS to every respondent such that I could remove the data of those responding from outside of the United States.

H) **Work with your favorite experience sampling app company.** I interviewed several. This helped me know how my study worked with their services. I interviewed ilumivu, Life Data, Expiwell, and Tracks. Expiwell was suited for a graduate study and offered discount graduate study price for unlimited sample size and complexity of the study. This was important because some companies add pieces of expenses. Another thing that Expiwell offered was handling payment to participants. This was critical to honor participant anonymity. While I did not know the identity of my participants, Expiwell checked on participants to make sure they were living and working in the United States by checking on their GPS if they came into the study on or off line.

I) **Pilot your study.** I piloted this study for a month because I needed to work the issues out with notifications on iPhones and Android smartphones, e.g., silence mode, block unknown contacts, and more. I didn't know what the problems would be. An introduced error in a question or a set up issue needs to be flushed out before going live.

J) **Clear your calendar when you go live.** I paid attention 24/7. Things come up. I had a burst of participants ignore my USA GPS requirement and come into the study, then expect to be paid when done. I was consistently clear on my website about what data I would and would not pay for. Don't pay for data that you can't use.

K) **Expect to clean out a lot of data.** There were many reasons participants were removed from this study. Participants may not have onboarded. Or they only responded 1-2 times and left. Or they onboarded but missed their start date (you can see all of these things in the participant log at Expiwell). This study's cleaning was done once I transferred the data CSV (comma separated values file) to my computer to then import it to SPSS for data analyses.

L) **Enjoy your data.** These were moments in the lives of real people in the study. Participants shared real life experiences as they answered surveys. They were self-reporting as honestly as they could at the time of the notification. Have fun learning from them.

APPENDIX G: MIND WANDERING STUDY CODEBOOK: ONBOARDING SURVEY

Age	Were you born between 1971 and 1996?	1=Yes, 2=No
USA (verified by GPS)	Do you work and live in the United States?	1=Yes, 2=No
WORK LOCATION	How would you mostly describe your work location?	1=At my employer's location, 2=At home, 3=A variety of places
PARENT STATUS	Are you a parent?	1=Yes, 2=No (skip logic if 2 to AGROUP)
PARENT SITUATION	How would you describe your parenting situation?	1=Children live with me, 2=Children live part-time with me, 3=Children live mostly in another household, 4=A combination of living situations
AGE GROUP	Which age group describes you?	1=25–32, 2=33–42, 3=43–50, 4=An age not listed here
COMMUNITY	How would you describe where you live?	1=City, 2=Suburb, 3=Town, 4=Rural
EDUCATION	How would you describe your level of education?	1=High school or GED, 2=Job training/some college, 3=Bachelor's degree, 4=Graduate degree
GENDER	How would you describe your gender identity?	1=Female, 2=Male, 3=Transgender female, 4=Transgender male, 5=A gender identity no listed here
RACE	How would you describe your racial identity?	1=Caucasian or White, 2=African American or Black, 3=Hispanic or Latino, 4=Asian or Pacific Islander, 5=Native American, 6=Multi-racial, 7=a racial identity no listed here

APPENDIX H: MIND WANDERING STUDY CODEBOOK: SURVEY

Q1	MW	In the last few minutes, I was mind wandering about things not about what I was doing.	1=Yes, 2=No (Used skip logic to Q6 if participant answered 2)
Q2	MWINTENTIONALITY	I was mind wandering because …	1=I WAS OPEN to thoughts about other things, 2=My thoughts about other things POPPED UP
Q3	MWTHOUGHT	I was mind wandering mostly about …	1=Day-to-day things I need to do, 2=Creative or interesting experiences, 3=Things I'm trying to figure out or plan, 4=Concerns or worries, 5=Other things not listed
Q4	MWCONTENT	My mind wandering thoughts were mostly related to …	1=My work, 2=My children, 3=Other family members or friends, 4=Myself, 5=Other things not listed
Q5	MWTIME	I was mind wandering about things happening mostly in the …	1=Past, 2=Present, 3=Future, 4=Never happened
Q6	CONTEXT	When responding to this notification, I was doing things mostly related to …	1=My work, 2=My children, 3=Other family members or friends, 4=Myself, 5=Other things not listed
Q8	DEMAND	When responding to this notification, I was doing tasks I consider …	1=Very demanding, 2=Demanding, 3=Somewhat demanding, 4=Not demanding
Q9	EMOTION	When responding to this notification, I was feeling mostly …	1=Great, 2=Very good, 3=Pretty good 4=Not so good
Textbox	ENGAGEMENT	Are there any comments you would like to add?	Text box for comments. 1=Comments, 2=No comments

APPENDIX I: DATA RECODES, REMOVALS, AND MISSING DATA DURING SELECTED ANALYSES

Mind Wandering Episode Data		cases removed	cases missing	N =
Descriptive Variable	Recode/Removed/Missing Data			
Mind Wandering Frequency	All mind wandering episodes			4,294
Thought Type	Recode for Practical Thoughts by combining *day-to-day things I need to do* and *things I'm trying to figure out or plan* Missing data for *other things not listed* due to generalizability and insufficient cell size for analyses (see Appendix K: Methodology Notes)		208	4,294 4,086
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		28	4,058
Thought Content	All mind wandering episodes			4,294
	Missing data for *other things not listed* due to generalizability and insufficient cell size for analyses		396	
	Removed *my children* from nonparent data	54		3,844
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		25	3,819
Temporality	All mind wandering episodes			4,294
	Missing data for *never happened* due to generalizability and insufficient cell size for analyses		152	4,142
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		25	4,117
Context	All mind wandering episodes			4,294
	Missing data for *other things not listed* due to generalizability and insufficient cell size for analyses		240	
	Removed *my children* from nonparent data	57		3,997
	Missing data for three transgender male participants only when analyzing for gender due to insufficient cell size		25	3,972
Context Demand	All mind wandering episodes	0	0	4,294
	All participant episodes analyzed for RQ4	0	0	7,947
Emotion	All mind wandering episodes	0	0	4,294
	All participant episodes analyzed for RQ4	0	0	7,947

APPENDIX J: MIND WANDERING STUDY WEBSITE UNIQUE VISITORS

Website Page: How to Participate in This Study

Unique Visitors N=3301
United States visitors
January–April 2022

Note: More visitors came from more populous states.

California
715
New York
248
Florida
241
Texas
224
Pennsylvania
190
Georgia
138
Illinois
125
Virginia
105
Massachusetts
97
Ohio
92
Washington
89
North Carolina
83
USA territories
75
New Jersey
61
Indiana
57
Michigan
53
Arizona
53

Maryland
52
Minnesota
48
Tennessee
47
Oregon
41
Colorado
37
Missouri
36
Oklahoma
36
Utah
33
Wisconsin
32
Kentucky
29
Connecticut
26
District of Columbia
22
Iowa
22
Rhode Island
19
Nevada
18
South Carolina
17
Nebraska
16
Alabama
15
Maine
12
Louisiana
11

Mississippi
11
Hawaii

11
Arkansas
10
Idaho
9
New Hampshire
8
Wyoming
8
West Virginia
6
New Mexico
6
Kansas
5
Montana
4
Delaware
3
Vermont
2
South Dakota
2
North Dakota
1

APPENDIX K: METHODOLOGY NOTES

Other Things Not Listed and *Never Happened*

Other things not listed and *never happened* would not normally be left out of data analyses. These survey choices were offered for Thought Type, Content, Temporality, and Context to avoid forced choices. These produced small cell sizes across parent status, gender, and intentionality. These data could not be defined. To keep the analyses focused on daily life work, children/family and self, these were not included beyond the initial tables. Here are the specifics for these data:

Thought Type: Out of 4294 thought type responses, *other things not listed* had 208 responses (4.8%). It was significantly less reported for intentional mind wandering with 83 episodes (3.3%) than for unintentional mind wandering with 125 episodes (7.0%), $\chi^2(1) = 30.559$, $p < .001$. Female parents reported 85 episodes (5.3%), male parents 28 episodes (1.8%), female nonparents 71 episodes (9.6%), and male nonparents 24 episodes (5.5%), $\chi^2(3) = 67.103$, $p < .001$.

Content: Out of 4294 content responses, *other things not listed* had 396 responses (9.2%) and was significantly less reported for intentional mind wandering with 166 episodes (6.6%) than for unintentional mind wandering with 230 episodes (12.9%), $\chi^2(1) = 48.380$, $p < .001$. Female parents reported 190 episodes (11.9%), male parents 58 episodes (3.8%), female nonparents 108 episodes (14.6%), and male nonparents 40 episodes (9.1%), $\chi^2(3) = 92.596$, $p < .001$.

Temporality: Out of 4294 responses to temporality, *never happened* had 152 responses (3.5%). It was significantly less reported during intentional mind wandering with 71 episodes (2.8%) than during unintentional mind wandering with 81 episodes (4.5%), $\chi^2(1) = 8.764$, $p < .003$. Female parents reported 50 episodes (3.1%), male parents 34 episodes (2.2%), female nonparents 43 episodes (5.8%), and male nonparents 25 episodes (5.7%), $\chi^2(3) = 25.430$, $p < .001$.

Context: Out of 4294 responses to context, *other things not listed* had 240 responses (5.6%). It was significantly less reported for intentional mind wandering with 111 episodes (7.0 %) than for unintentional mind wandering with 129 episodes (7.2%), $\chi^2(1) = 15.256$, $p < .001$. Female parents reported 111 episodes (7.0%), male parents 40 episodes (2.6%), female nonparents 74 episodes (10.0%), and male nonparents 15 episodes (3.4%), $\chi^2(3) = 62.160$, $p < .001$.

About Participants Who Reported Mind Wandering All the Time

As noted in Chapter 4, some participants reported that they were always mind wandering when notified. Their data was thoroughly analyzed for patterning, Mahalanobis distance, and inspected for engagement before being retained in the study. Of these 65 participants, 57 were parents and 8 were nonparents. As a final check for inclusion, I analyzed the frequency data without these participants' data. The participant level averages were 47.1% mind wandering for 362 participants. This was 49.1% for 224 parents, 43.8% for 138 nonparents. The t-test for these results also showed a statistically significant difference between parents and nonparents, t(360) = 2.098, p= .037. While these data were lower than the 55% of the participant level findings for all participants, the findings were consistent with the differences when all of the participant data were analyzed.

Male parent participants

Male parents reported higher rates of mind wandering episodes. While these participants joined the study from all over the United States, their demographics are summarized here because male parents as a group reported high education levels, working mostly away from home, living in cities, racial identity as mostly either white or black, and were older with ages in thirties to forties. The demographic tables in Chapter 4 provide comparisons with female parents, female nonparents, and male nonparents.

1. *Higher education level*: bachelor's or graduate degree 92.8% compared to female parents 65.4%, male nonparents' 78.4% and female nonparents 83.7%.
2. *Work location mostly away from home*: at their employer's 72%, while female parents were 44.9%, female nonparents were 45.7%, and male nonparents were 45.1% at employer's. Of male parents, only 10.4% reported working at home.
3. *Most living in the city* (77.6%) compared to female parents being just 34.6% in the city.
4. *Racial identity* 60% white, 33.6% black, while female parents were 71.8% white and 13.5% black. Male nonparents were also 56.9% while with 17.6% black and roughly 26% of color.
5. *Age* over half 32-42.

Response Rate and Missed Notifications

Missing notifications is an anticipated source of data loss in daily life experience sampling studies as noted in Chapter 3. With a national sample in daily life, I could not require response rate compliance as can be done in lab-based studies. I increased incentive for participants to respond to notifications by paying participants with an Amazon $10 gift card for twenty submissions out of up to 30 notifications. Table N1 shows 59.3% of 427 participants responded to 20 or more notifications out of up to 30 possible notifications, depending on how long they stayed in the study after reaching the response rate for the incentive.

To estimate the notification response rate broadly, if 427 participants were in for the full five days and each was notified times, they could have potentially responded to 12,810 notifications. As 7,947 notifications were answered, the response rate would be no less than 62% for this study. However, this rate misrepresents the notification response rate since participants had various reasons for participating 1-2-3-4-5 days or answering / not answering. Participants had all sorts of reasons for not answering a notification. They were instructed not to answer notifications while doing something that could be dangerous, e.g., driving or walking across a street, or pre-empting, e.g., leading a meeting.

By using the participant submissions data and the six notifications per day, participants received roughly over 9,000 notifications. With 7,947submissions, I estimated about 87.6% of the notifications were answered. *Table K1* provides the range of participants' submissions from 4 to 30. Those who completed over 20 responses had to participate for at least four days. Those between 21 and 30 responded beyond the requirement for payment. It is likely that those who had fewer submissions left the study early, e.g., on the same day as their last submission. It is likely that those who completed 20 submissions left the study after they had reached the incentive requirement. Therefore, 87.6% seems predictive of the notifications answered.

Table K1

N = 427 Participant Number of Responses to Notifications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	10	2.3	2.3	2.3
	5	10	2.3	2.3	4.7
	6	6	1.4	1.4	6.1
	7	11	2.6	2.6	8.7
	8	3	.7	.7	9.4
	9	10	2.3	2.3	11.7
	10	8	1.9	1.9	13.6
	11	9	2.1	2.1	15.7
	12	18	4.2	4.2	19.9
	13	11	2.6	2.6	22.5
	14	15	3.5	3.5	26.0
	15	17	4.0	4.0	30.0
	16	20	4.7	4.7	34.7
	17	20	4.7	4.7	39.3
	18	11	2.6	2.6	41.9
	19	20	4.7	4.7	46.6
	20	35	8.2	8.2	54.8
	21	35	8.2	8.2	63.0
	22	16	3.7	3.7	66.7
	23	26	6.1	6.1	72.8
	24	27	6.3	6.3	79.2
	25	26	6.1	6.1	85.2
	26	22	5.2	5.2	90.4
	27	23	5.4	5.4	95.8
	28	12	2.8	2.8	98.6
	29	5	1.2	1.2	99.8
	30	1	.2	.2	100.0
	Total	427	100.0	100.0	

APPENDIX L: PERMISSIONS AND COPYRIGHTS

Figure 1.6   *Madame Moitsessier Seated,* artist, Jean-Auguste-Dominique Ingres, 1856.
*Madame Moitessier Seated. Madame Moitessier Mind Wandering.*

Note: Photo of *Madame Moitsessier Seated,* artist, Jean-Auguste-Dominique Ingres, 1856. Copyright 2022 by Paula C. Lowe. *Madame Moitessier Mind Wandering,* artist, Paula C. Lowe. Copyright 2022 by Paula C. Lowe.

Ingres' painting of Madam Moitsessier has long been on public display as it is in the permanent collection at The National Gallery in London, United Kingdom. I have viewed it many times in this museum, always with fascination. As an art history major, I appreciated the rendering of the hands and face, yes, very Mona Lisa-esque. But for me, the masterpiece is in the painting the floral patterned dress with its dazzle of flowers. I photographed Ingres' painting when I was most recently viewing the art on April 9, 2016. I apolgize for not including Madame's left hand with its jeweled wrist. Also missing is Madame's back as reflected in the dimly lit room's mirror.

National Gallery London has no restrictions on museum visitors photographing any of the art in the permanent collection. The museum posted on its website, https://www.nationalgallery.org.uk/visiting/visitor-photography, "photography is allowed for personal, non-commercial purposes in the National Gallery, and it is the visitor's responsibility to ensure no copyright is infringed." This painting was and is in the permanent collection which is not an exhibition.

Figure 3.3

App Experience Sampling Calendar With Notification Timeframes
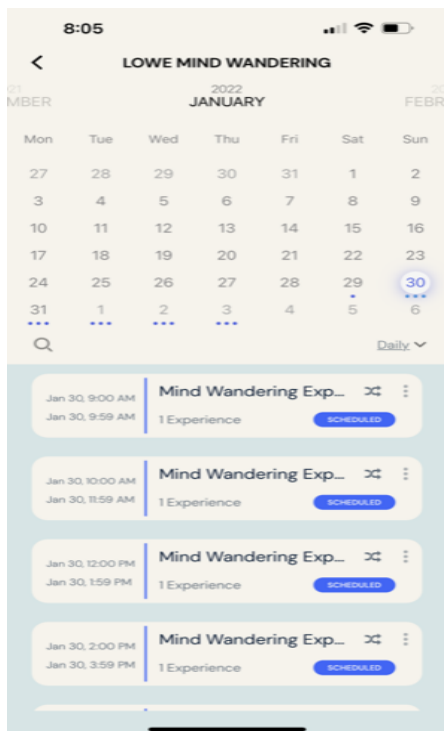
This is a screenshot of the Expiwell App Experience Sampling Calendar with Notification Timeframes. It displays the Lowe Mind Wandering Study and how the app shows a participant what to expect on a day of random notification experience sampling. This screen has been shared with written permission by Expiwell for the purpose of this dissertation.