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Routes Toward Consumer Self-Control

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MINDFULNESS AND CONSUMPTION

Letícia Vedolin Sebastião

MINDFULNESS AND CONSUMPTION:

ROUTES TOWARD CONSUMER SELF-CONTROL

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Mindfulness and Consumption:

Routes Toward Consumer Self-Control

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Abstract:

This dissertation consists of three papers, an integrated discussion chapter and a reflection chapter. The first paper is a systematic review of the literature on mindfulness and consumption, integrating findings from different fields of research and shedding light on how mindfulness affects consumer behavior. The second paper empirically tests whether mindfulness can be a boundary condition for the effects of uncertainty on virtuous consumption. The third paper empirically tests whether learned mindfulness can affect the anti-saccade task. Finally, I attempt to integrate the findings from the three papers in a closing chapter and reflect on my journey as a PhD student at Copenhagen Business School.

Denne afhandling består af tre artikler, et diskussionskapitel samt et refleksionskapitel. Den første artikel er en systematisk gennemgang af litteraturen indenfor mindfulness og forbrug, hvor resultater fra forskellige forskningsfelter sammenstilles og sammenlignes. Artiklen kaster derved lys over hvordan mindfulness og forbrug er blevet videnskabeligt undersøgt og sætter ofte modstridende resultaterne i perspektiv. Den anden artikel tester empirisk, hvorvidt mindfulness kan støtte et hensigtsmæssigt forbrug (bevidst beslutning). Ikke mindst forsøger undersøgelsen at afklare grænsen for effekten af mindfulness. Den tredje artikel tester empirisk hvorvidt praktiseret mindfulness kan påvirke ubevidst adfærd og visuel opmærksomhed (antisaccade-opgaven). Til sidst integreres resultaterne fra de tre artikler i et afsluttende kapitel, og jeg reflekterer over min rejse som ph.d.-studerende ved Copenhagen Business School.

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Introduction:

Since the beginning of the 21st century, marketing science has been concerned with the 'functions and malfunctions of consumption' (Achrol and Kotler, 2012). In their paper 'Frontiers of the marketing paradigm for the third millennium', Achrol and Kotler propose that marketing should be about 'creating a healthy consumption environment as well as about protecting the consumer from overconsumption' (Achrol and Kotler, 2012, p. 44). This perspective reverberated in initiatives such as the Transformative Research Movement (Davis et al., 2016). TRM proposes a line of consumer research concerned with well-being and improving life (Davis et al., 2016). Problems such as 'materialism, poverty, obesity, hunger, injustice or vulnerability' (Davis et al., 2016, p. 159) are among the objects of research in TRM.

Overconsumption is defined as a 'situation where the harms generated by our consumption, collectively or individually, start to have negative impacts that outweigh that consumption's overall benefits' (Hensher et al., 2020, p. 2). Examples of this could be smoking, drinking alcohol, obesity, or pollution due to overproduction. Overconsumption therefore reduces well-being, leading to costs in the health-care system (Hensher et al., 2020), and generates problems for individuals, society, and the environment (Bahl et al., 2016).

In this form of consumption, consumers exhibit lower levels of self-control, exchanging long-term benefits for short-term gains (Brown and Cameron, 2000, Milkman et al., 2008, Cornil et al., 2021). The issue here is that the short-term gains come with long-term losses in health, individual well-being, work and academic performance, financial status (Nigg, 2016), and ultimately, environmental well-being.

One field that has recently drawn the attention of consumer researchers for its potential to alleviate the harms of overconsumption is mindfulness. Mindfulness-based interventions have been used to address issues related to consumption, and mindfulness has been identified as a potential solution for the personal, environmental, and societal crises caused by overconsumption (Bahl et al., 2016).

Mindfulness is defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment"

(Kabat-Zin, 2003, p. 145). This definition entails three aspects of mindfulness, specifically, intention, attention, and attitude (Shapiro et al., 2006). An intention is set in the onset of mindfulness practice to determine why one is practicing. During the practice, one pays attention to internal and external stimuli in the present moment, and one maintains an attitude of kindness and nonjudgment in response to one's experience. If, for example, one experiences negative thoughts and emotions while being mindful, one cultivates an attitude of compassion toward those thoughts and emotions instead of perpetuating criticism about having them.

Claims that mindfulness can prevent overconsumption have been received with enthusiasm by consumer researchers, but there has also been criticism that mindfulness has become hyped and presented as a panacea that can be used to address any issue (van Dam et al., 2018). Additionally, there is a lack of clarity around the operationalizations of mindfulness that are used interchangeably in the research.

In the first paper of this dissertation, we identify two main types of mindfulness, specifically, trait mindfulness and mindfulness practice. Trait mindfulness is an innate characteristic of those who are aware of and attentive to internal and external stimuli. This characteristic is relatively stable throughout life and is associated with lower levels of overconsumption as well as sustainable consumer behavior. The second type of mindfulness is a form of attentional practice that can be learned through individual training. Those who learn how to practice mindfulness also become better at resisting urges to consume compulsively, although they do not engage in more sustainable behaviors. These two types of mindfulness have fundamental theoretical differences. The first is funded in personality and trait psychology, and the second involves cognitive psychology's adaptation of Eastern practices and philosophies.

This differentiation is not clear in the mindfulness and consumption literature. Rather, researchers in mindfulness and consumption tend to use different types of mindfulness and different assumptions about how mindfulness works in the same research paper. What is evident in a review of the field is that mindfulness generally contributes to consumer self-control and the reduction of overconsumption. There is, however, a lack of clarity over how resource demanding this is for consumers (Creswell, 2017) and how self-control works through mindfulness. This calls for research that clarifies the field as we do in our first paper and that tests the effects of mindfulness on consumers to learn more about how mindfulness contributes to consumer self-control.

In this dissertation, we empirically focus on the effects of mindfulness practices (Articles 2 and 3). Additionally, in our literature review, we identify the two types of mindfulness and three camps of mindfulness and consumption research, along with the consistencies and inconsistencies in their outcomes (Article 1). We use different methods to address the following research question:

How does mindfulness affect consumer self-control?

The first paper consists of a systematic literature review of the field of mindfulness and consumption. The second paper empirically tests the effects of mindfulness on self-control under uncertainty. The third paper tests the effects of mindfulness on a subconscious self-control task. Finally, in the concluding chapter, I present an integrated discussion. I also address limitations in the effects of mindfulness and suggest that researchers, practitioners, and policy-makers should be careful when asserting that mindfulness can solve personal, environmental, and societal problems (Bahl et al., 2016).

To address the research question, my coauthors and I draw on the literature on mindfulness theory (Hart et al., 2013), ego depletion theory (Baumeister et al., 1994, 2018) and neuroplasticity (Fuchs & Flügge, 2014; Treadway et al., n.d.) (see Table 1). Further elaboration on theories of self-control are presented in the dissertation's concluding chapter. Our research finds that both types of mindfulness lead to self-control in compulsive consumption, but only trait mindfulness is associated with sustainable behavior (Paper 1). Furthermore, our findings suggest that mindfulness can be a boundary condition to the effects of uncertainty on virtuous consumption (Paper 2) and that mindfulness meditation can demand the use of cognitive resources for self-control and volition (Paper 3). These seemingly contradictory findings are in line with previous literature in which mindfulness has been found to be both resource depleting (Creswell, 2017) and resource effective (Friese et al., 2012; Keng et al., 2013).

Table 1. Summary of articles in the dissertation

Paper	Article 1	Article 2	Article 3
Mindfulness type	Two types of mindfulness (trait and practice)	Mindfulness practice	Mindfulness practice
Theoretical Framework	Mindfulness theories (van Dam et al., 2018; Hart et al., 2013)	Ego depletion theory (Baumeister et al., 1994, 2018)	Neuroplasticity (Fuchs & Flügge, 2014; Treadway et al., n.d.)
Outcome	Self-control	Self-control	Inhibitory control

Definition of outcome	Capacity to "override of a stronger, stimulus-driven representation with a weaker, memory-driven representation" (Nigg, 2016, p. 4)	"Top-down ability to intentionally or effortfully suppress a triggered behavior to sustain behavior toward a goal" (Nigg, 2016, p. 3)

In the proceeding pages, the dissertation's three articles (see summary in Table 1) will be introduced, followed by an integrated discussion chapter.

This dissertation contributes to mindfulness theory by shedding light on how mindfulness affects consumer self-control. It does so by providing an overview and classification of the field of mindfulness and consumption in three camps and two types of mindfulness, specifically, trait and practiced mindfulness. Through its empirical findings, the dissertation also contributes to the theory by suggesting that mindfulness is a boundary condition of the effects of uncertainty on self-control and that it might be resource demanding when consumers aim to exert inhibitory control.

The dissertation also contributes to policy-makers who, after reading it, will have a better understanding of what mindfulness is and how it works. Policy-makers are cautioned to be careful with regard to the 'hype' around mindfulness and to examine the research thoroughly before advocating for its potential benefits. At the same time, policy-makers can use this dissertation to promote consumer self-control.

Finally, this dissertation delivers important insights for marketeers aiming to promote mindful consumption as a CSR strategy or to understand how their mindfulness-practicing customers behave around consumption. In a society where mindfulness practice is becoming more popular, marketeers can use this dissertation to understand how mindfulness affects their customers and how it will subsequently impact society.

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Article 1

Clarifying the Research Approach to Mindfulness in Consumption:

A Systematic Literature Review

Letícia Vedolin Sebastião, Torsten Ringberg, Jesper Clement

Abstract:

Mindfulness has been presented as a possible solution for reducing dysfunctional decisions related to personal, environmental, and societal behavior. There has, however, been a lack of clarity about the types of mindfulness upon which researchers build their assumptions. To address this issue in the literature, we classify the research on mindfulness and consumption according to three camps of mindfulness research, outlining the theoretical foundations, outcomes in consumption, and assumptions about the concept of self in each camp. We find that the findings from the three camps are sometimes inconsistent, as is the case in mindfulness and sustainability research. We conclude by proposing that researchers should control for different types of mindfulness in their research, which will reduce the overestimation of the benefits of mindfulness for consumers.

Keywords:

Mindfulness, consumer behavior, consumer psychology, self-control, sustainability

1. Introduction

Global crises, such as the COVID-19 pandemic, the energy crisis, and climate change, influence individuals to reconsider their lifestyle and look for tools that enable a more balanced and healthier way of living (Brust et al., 2021). Attaining mindfulness has been popularized as a tool to attain such a lifestyle. Correspondingly, an impressive range of mindfulness initiatives have been promoted, ranging from commercial apps such as Calm™ and Headspace™, to mindfulness-based programs for organizations and companies such as Google™ (Schaufenbuel, 2015) and Intel™ (Knowledge at Wharton, 2018), to its application within research, as presented in organizational studies (Rashkova, Moi and Cabiddu, 2023) and marketing research (Sheth, Sethia and Srinivas, 2011). The rise in interest in attaining mindfulness has showed a steep increase during the last ten years. Mindfulness is most often defined as an "awareness that arises through paying attention, nonjudgmentally, to the present moment" (Kabat-Zinn, 2003, p. 145) and to the unfolding of experiences as these arise. According to the National Health Interview Survey 2017, 14.2% of adults have learned meditation and 14.3% have learned yoga in the US (CDC/National Center for Health Statistics, 2018). This percentage grew from 9.5% and 4.1%, respectively, according to the 2012 survey (CDC/National Center for Health Statistics, 2018). In 2022, 36 million Americans practiced meditation (Marketdata LLC, 2022).

Along with the increased public interest in mindfulness-based activities, research on mindfulness practices and outcomes has also increased significantly (van de Veer et al., 2016; Xiao et al., 2017; Schuman-Olivier et al., 2020). However, the latter research represents a range of approaches as well as assumptions about the workings of mindfulness. This has led to conflicting representations in the research regarding what is required to achieve a mindful state as well as how such a state can even be defined. While some research suggests that mindfulness leads to positive outcomes related to personal, environmental, and societal issues, including a reduction in overconsumption (Bahl et al., 2013), other authors argue that the research suffers from an overestimation of the potential benefits of mindfulness (van Dam et al., 2018). In the words of Farias and Wikholm (2016), the field lacks a critical self-evaluation. In this review, we provide such a critical reflection focusing on the assumptions that underpin the various types of mindfulness as well as outcomes. Three camps of mindfulness can be identified. Within the first camp, researchers assume that mindfulness is achieved from either short-, intermittent- or long-term practices performed either

intermittently or more frequently. Such practices include meditation, yoga, tai-chi and other contemplative practices or a combination of these. Within the second camp, researchers assume mindfulness to be an innate, inherent, trait-like property, which may vary in propensity across individuals (van Dam et al., 2018). Within the third camp, researchers assume that mindfulness stemming from practices (i.e., learned) can be transformed into an inherent mindfulness trait (Kabat-Zinn, 2003; Sherza, DeMarree and Naragon-Gainey 2022).

This distinction is further complicated by the fact that research involving mindfulness practices often fails to control for the presence of innate mindfulness among subjects when experimentally testing the effects of various mindfulness practices. This is especially the case within the psychological research (Van De Veer et al., 2016), which might explain the divergent findings. While research that does not control for innate mindfulness has not found any causal connections between mindfulness practices and sustainable behavior (Geiger et al., 2019), the limited research that does control for innate mindfulness among its subjects shows that trait mindfulness indeed leads to more sustainable behavior (Frank et al., 2019). This raises the question of whether mindfulness originating from trait- vis-a-vis practice mindfulness differs fundamentally in psychological mechanisms and outcomes. Finally, an important distinction between the types of mindfulness identified in this literature review refers to the conception of *self* within the three camps of mindfulness. The experience of a sense of self is relevant to the mindfulness literature because of the question of whether there is a self in control that might be affected by mindfulness practices. Within Buddhist philosophy, which gives rise to the research on learned mindfulness, "the central tenet […] with respect to the self is that there is no unchangeable self" (Xiao et al., 2017, p. 1). The research on trait mindfulness, on the other hand, assumes the existence of a stable self that is responsible for cognition and behavior (Xiao et al., 2017). The research on mindfulness stemming from ongoing practices defines a regulated self. This therefore begs the question of whether the research on the three camps of mindfulness is measuring the same type of mindfulness.

More generally, the mindfulness research contributes to marketing (Bahl let al., 2016) and psychology (Rosenberg, 2005) by presenting ways in which consumers and individuals, in general, can regulate their emotions and subsequent consumer behavior. This issue is being addressed by mindfulness researchers who aim to find solutions for crises in consumer well-being (Bahl et al., 2017). Especially relevant for our focus is mindful consumption, a concept

that is particularly prevalent within the sustainability agenda, in which consumers are seen as decision-makers when choosing more sustainable products and services, also defined as temperance in consumption (Sheth et al., 2011). For example, overconsumption and malefic consumption are topics of particular interest for consumer behavior researchers engaged in mindfulness studies, as this type of consumption has huge ramifications for consumer health issues. These issues include the need to bring down increasing obesity, which affects a staggering 13% of the world's adult population (WHO, 2021). Moreover, an estimated 38.2 million children under 5 years of age are overweight or obese (WHO, 2021). Malefic consumption relates to consumption situations where consumers know that they will experience long-term negative consequences from a particular consumer behavior, but despite that clear understanding, they decide to overconsume because they believe they will also obtain short-term benefits (Milkman et al., 2008). Overconsumption is a form of consumption where consumers fail to self-control their hedonic intake and believe that it will lead to higher levels of well-being (Brown and Cameron, 2000, Cornil et al., 2021). This can happen with food, alcohol, cigarettes, clothes, internet usage or even the overuse of natural resources. Both clinical (addicts or compulsive consumers) and nonclinical populations can experience failures in self-control that lead to overconsumption. Given the positive role attributed to mindfulness in reducing malefic consumption, it is important to understand how mindfulness is achieved. As discussed above, this remains unclear given the current state of affairs within the mindfulness research, i.e., there is an outstanding question of whether mindfulness can be achieved through practices or rather requires an innate disposition.

In the next section, we review the literature on mindfulness with a special focus on the various conceptualizations of and approaches to achieving mindfulness. We also consider whether the reported outcomes can be attributed to the manipulations presented in the research or whether they might be the results of an underlying distribution of innate mindfulness among participating subjects whose mindfulness is activated.

2. Literature review method

Following the procedures from Becker and Jaakkola (2020), the following review of the mindfulness literature is based on queries in Scopus and Web of Science as well as informal

conversations with specialists. Initially, 23 articles were identified. They provided an overview of the field. This initial procedure is called a scoping search (Booth et al., 2012) and was the first stage of the systematic literature review search. Using this as the starting point, a general overview of the field of mindfulness and consumption research was attained, including a broad perspective on mindfulness practices. These 23 articles were used as points of entry to additional readings and identification of other research approaches and inconsistencies related to mindfulness within academic research.

The next step included identifying papers that contributed empirical results within the field of mindfulness and consumption. A search on Scopus and Web of Science was carried out with the following search query: MINDFULNESS, CONSUM* or CONSUMER BEHAVIOR*, specifying that only peer-reviewed articles would be accepted. These keywords had to be present in the title, the abstract, or within the author's keywords. Seven hundred twelve articles were extracted from the two platforms in April 2020, with no lower limit for the date of publication. One hundred eighty-three articles were duplicates and consequently excluded.

Most of the publications were from journals within the health sciences domain (68%), indicating that the discussion of mindfulness and overconsumption occurs mostly in fields other than marketing. Following the procedures from Becker and Jaakola (2020) and Danese et al. (2017), two exclusion criteria were identified: (i) articles that were not at the intersection between mindfulness and overconsumption and (ii) articles that investigated mindfulness and overconsumption in a context other than that of consumption per se (e.g., cancer, domestic violence, adolescence). To apply these exclusion criteria, the titles and abstracts of 529 selected articles were read. This resulted in a final dataset of 51 relevant articles, of which 9 were not empirical papers.

After identifying relevant articles in academic journal databases, a bibliographic search was performed (Becker & Jaakkola, 2020; Booth et al., 2012). At this stage of the literature search, the top ten influential marketing journals on the AJG 2021 list were explored for articles that included the theme of 'mindfulness'. Each journal's website was visited, and four additional articles were included in the dataset, for a total of 55 articles. Each article was then taxonomically coded (Onwuegbuzie et al., 2016), meaning that distinctions found in previous theory, such as the difference between trait- and learned mindfulness and the distinction between outcomes in mindset and behavior, were used as codes. The first author coded all the articles.

In the following sections, we introduce concepts that are relevant for the present review such as mindful consumption and overconsumption – or malefic consumption. Following this introduction, we describe the results of the analysis from which three distinctive camps emerge. Within the first camp, researchers assume that mindfulness is a trait property akin to some deeply innate characteristics, although it might vary in propensity across individuals (van Dam et al., 2018). Within the second camp, researchers assume that mindfulness practices, including meditation, yoga, tai-chi and other contemplative practices or a combination of these, based on either short intermittent or more frequent and longer practices, can develop into learned (i.e., innate) mindfulness (Kabat-Zinn, 2003; Sherza, DeMarree and Naragon-Gainey 2022). Within the third camp, researchers regard mindfulness as a temporary state of mind spurred by ongoing contemplative practices (Bravo et al., 2017).

We discuss the findings and illustrate the conceptual differences between innate and practice-based mindfulness. We then derive implications from our analysis for consumer researchers, marketers, and policy-makers, including new avenues for research in this field.

3. Mindfulness in consumer research

The research on mindfulness and consumption began in seriousness after the seminal work by Rosenberg (2004) and is now published in mainstream journals across a variety of fields (e.g., Seguias & Tapper, 2018; Bahl et al. 2017; Ostafin et al., 2013a). However, there is a surprising lack of reflection by both practitioners and researchers in regard to both differentiating between innate/trait mindfulness and learned/practiced mindfulness and controlling for the latter. Similarly, the research in the health sciences does not distinguish between inherent mindfulness and learned mindfulness (van Dam et al., 2018). While this lack of differentiation might be inadvertent and likely caused by an eagerness to prove the potential of mindfulness to benefit negative consumption practices, it brings into question findings from research that explores the effects of ongoing mindfulness practices. In fact, some recent research now shows that inherent/trait and ongoing mindfulness might not yield similar outcomes. Geiger et al. (2019) discuss the findings

that trait mindfulness is correlated with sustainable behavior while mindfulness practice has not yet been found to cause sustainable behavior.

The present review emphasizes how this lack of differentiation exists across the extant mindfulness literature. In the following sections, we categorize and describe the three camps of mindfulness, i.e., innate/trait mindfulness, emerging/learned properties, and ongoing practices within the mindfulness and consumption research. We define and conceptualize the three approaches to mindfulness and discuss their foci and theoretical backgrounds as well as their particular outcomes. We also show how assumptions about the role and definition of self vary across the mindfulness camps.

In Table 1, we provide an overview of the three types of mindset approaches; a description of how each conceptualizes the notion of consumer agency, i.e., the role of self; and an overview of the impact (behavioral outcomes) from within the three camps. We include the conceptualization of mindfulness as a personality trait, a learned property of the mind or a state that demands ongoing practice, along with the theoretical backgrounds of each mindfulness camp. We then describe the nature of each camp and provide examples in consumer research.

Table 1. The three camps of mindfulness in consumption

Three Mindfulness Categories			
Camp in Mindfulness Research	Innate. Constant property of the mind. Requires no practice.	Emerging property of the mind (from practice to inherent)	Mindfulness practice requiring ongoing practices
Type of Mindfulness	Trait Mindfulness (Adams et al., 2015; Schellhas et al., 2016, and others)	Learned Mindfulness From practice to permanence (Davidson and Lutz, 2008)	Ongoing mindfulness practices (Bowen & Marlatt, 2009; Orazi et al., 2019; Dutt et al., 2019, and others)
Theoretical Ground	Trait Theory (Weiss, 2020)	Neuroscience and Neuroplasticity (Treadway & Lazar, 2010)	Cognitive Psychology (Segal, Z. V., Teasdale, J. D., & Williams, J. M. G., 2004)
Assumption	A type of personality	Neurological changes in the brain wiring. Changes to mental models	Reflective thinking and behavioral patterns
Nature	Innate, determined by biology. As a trait, mindfulness is determined by biological and genetic factors that are minimally influenced by sociocultural and environmental inputs during individuals' upbringing (Weiss, 2020).	Changes in brain structure and function due to continuous practice (Davidson and Lutz, 2008)	Superficially anchored. Requires ongoing practices to activate outcomes (Bravo et al., 2018)
Population	Naturally mindful individuals	Individuals who practice in search of enlightenment	Individuals with various clinical/nonclinical disorders
Consumer Behavior	These individuals recognize desires as transient phenomena and thus show higher self-control and temperance in consumption, for example, with regard to impulse buying (Garland et	These individuals show less emotional reactivity and enter a state of concentration and focused attention with optimized effort. This suggests that they would be less prone to consuming to cope with emotions. Example:	These individuals become able to regulate their consumption by decoupling remembered consumption cues. Example: "Tapper (2018, 2017) explains that cravings occur through the activation of memories associated with

	al., 2012; Watson, 2019; Bowlin and Baer, 2012). Example: Schellhas et al. (2016) "individuals high in trait mindfulness think about consuming alcohol as drinking a liquid from a glass."	There's an inverted u-shape curve in brain activation during meditation (Davidson and Lutz, 2008). Those who are highly experienced show lower levels of brain activity than those in the mid-range. This suggests that for experienced meditators less effort is needed to achieve high levels of concentration.		cues that signal consumption. These cues may be external or internal, physiological, or emotional. The argument is that when a person focuses his/her attention on the present moment through practicing mindfulness, the mind stops elaborating on consumption memories. These changes in mind should eventually reduce the intensity and duration of cravings."	
Tests	Effects are tested through correlation and scales. The research on trait mindfulness utilizes self-report scales. As many as eight unidimensional mindfulness scales were identified in the review such as the Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003) and the Five Facet Mindfulness Questionnaire (FFMQ, Baer et al., 2006). Each scale has been validated to measure trait mindfulness (Siegling and Petrides, 2014) and to identify correlations between trait mindfulness and other variables, particularly in the field of consumer psychology (Brett et al., 2017; Jordan et al., 2014; Karyadi et al., 2014; Sala et al., 2019).	Effects are tested through experiments with highly experienced meditators such as monks and nuns.		Effect are tested based on short/long term manipulations with mindfulness practices.	
Sense of self	Coherent self	No-self		Regulated self	
Outcomes	Compulsive Consumption	Sustainability	Compulsive Consumption	Compulsive Consumption	Sustainability
Examples of Articles	Adams, C. E., Cano, M. A., Heppner, W. L., Stewart, D. W., Correa-Fernández, V., Vidrine, J. I., Li, Y., Cinciripini, P. M., Ahluwalia, J. S., & Wetter, D. W. (2015). Testing a Moderated Mediation Model of Mindfulness, Psychosocial Stress, and Alcohol Use Among African American Smokers. Mindfulness, 6(2), 315–325. https://doi.org/10.1007/s12671-013-0263-1	Helm, S., & Subramaniam, B. (2019). Exploring socio-cognitive mindfulness in the context of sustainable consumption. Sustainability (Switzerland), 11(13). https://doi.org/10.3390/su11133692	Tang, Y. Y. (2017). The Neuroscience of Mindfulness Meditation: How the Body and Mind Work Together to Change Our Behaviour. The Neuroscience of Mindfulness Meditation: How the Body and Mind Work Together to Change Our Behaviour, 1–94. https://doi.org/10.1007/978-3-319-46322-3	Davis, J. M., Mills, D. M., Stankevitz, K. A., Manley, A. R., Majeskie, M. R., & Smith, S. S. (2013). Pilot randomized trial on mindfulness training for smokers in young adult binge drinkers. BMC Complementary and Alternative Medicine, 13. https://doi.org/10.1186/1472-6882-13-215	Dhandra, T. K., & Park, H. J. (2018). Mindfulness and gender differences in ethical beliefs. Social Responsibility Journal, 14(2), 274–286. https://doi.org/10.1108/SRJ-05-2016-0067
	Leigh, J., & Neighbors, C. (2009). Enhancement motives mediate the positive association between mind/body awareness and college student drinking. Journal of Social and Clinical Psychology, 28(5), 650–669. https://doi.org/10.1521/jscp.2009.28.5.650	Stanszus, L., Fischer, D., Böhme, T., Frank, P., Fritzsche, J., Geiger, S., Harfensteller, J., Grossman, P., & Schrader, U. (2017). Education for Sustainable Consumption through Mindfulness Training: Development of a Consumption-Specific Intervention. Journal of Teacher Education for Sustainability, 19(1), 5–21.		Ruffault, A., Carette, C., i Puerto, K., Juge, N., Beauchet, A., Benoliel, J.-J., Lacorte, J.-M., Fournier, J. F., Czernichow, S., & Flahault, C. (2016). Randomized controlled trial of a 12-month computerized mindfulness-based intervention for obese patients with binge eating disorder: The MindOb study protocol. Contemporary Clinical Trials, 49, 126–133. https://doi.org/10.1016/j.cct.2016.06.012	Frank, P., Sundermann, A., & Fischer, D. (2019). How mindfulness training cultivates introspection and competence development for sustainable consumption. International Journal of Sustainability in Higher Education, 20(6), 1002–1021. https://doi.org/10.1108/IJSHE-12-2018-

3.1. The first camp: innate mindfulness as a personality trait

Innate/trait mindfulness represents an innate personal characteristic, i.e., living with an awareness of and nonjudgmental attention to the present moment. The level of innate mindfulness varies across individuals. Individuals with a high level of innate trait mindfulness are highly aware of internal and external stimuli, attentive to the present moment, and focus on positive personal experiences (Adams et al., 2015).

Innate mindfulness is regarded as a personality trait and as such considered stable over time and situations. That is, this trait is determined by biological and genetic factors that are minimally influenced by sociocultural and environmental inputs during individuals' upbringing (Weiss, 2020).

Research on trait mindfulness utilizes self-report scales to identify correlations between trait mindfulness and other variables in the field of consumer psychology (Brett et al., 2017; Jordan et al., 2014; Karyadi et al., 2014; Sala et al., 2019). Levels of trait mindfulness are measured using acknowledged scales that vary across individuals. As many as eight unidimensional mindfulness scales were identified in the literature review. Each has been validated to measure trait mindfulness (Siegling and Petrides, 2014). These scales include the Mindful Attention Awareness Scale (MAAS, Brown & Ryan, 2003) and the Five Facet Mindfulness Questionnaire (FFMQ, Baer et al., 2006). While they measure different conceptualizations of mindfulness and follow different theoretical traditions, the scales have been found to have little convergent validity (Siegling and Petrides, 2014). Some scales follow Kabat-Zinn's (2003) perspective of mindfulness based on Eastern traditions (Hart et al., 2013), while others follow Ellen Langer's perspective, which is based on a Western approach to mindfulness (Hart et al., 2013). The Eastern perspective is based on ancient Buddhist teachings, while the Western approach is devoid of spiritual influences. Previous research has found a moderate correlation (0.31–0.67) (Baer et al., 2006) between five of the scales that follow Kabat-Zinn's perspective on mindfulness, whereas the scales following Langer's perspective of mindfulness have been found to have weak correlations (0.27–0.37) with other scales (Pirson et al., 2012).

3.1.1. Trait mindfulness and the sense of self

The concept of self is a central aspect of Buddhist teachings, and it provides the basis for mindfulness theories (Xiao et al., 2017). The self allows for the benefits of mindfulness to be actualized in individuals' minds and behaviors and connects mindfulness teachings to well-being outcomes (Xiao et al., 2017). Concepts such as self-awareness, self-actualization, and self-monitoring are essential aspects within mindfulness theories; such concepts are possible only because of the assumption that there is a self that is mindful.

Within the trait mindfulness perspective, the self consists of boundaries that form the experience of being an individual, separate from others and the environment. This development begins in early childhood, and in healthy individuals, it leads to a coherent sense of self (Budd, 1993). Disturbances to this development of coherence can result in personality disorders, such as borderline personality organization, neurosis, or psychosis, which lead to "fragmentation of the body, self, mind and the self-object" (Scalabrini et al., 2018, p. 2).

Personality research assumes that there are neurobiological correlates responsible for the experience of self in human and animal brains. This is "a complex, distributed and functionally based system of the self" (Scalabrini et al., 2018, p. 2) based on subcortical and cortical midline structures as well as lateral somatosensory cortices and mirror neuron areas. Awareness of the self allows individuals to connect external events to their internal impulses and is responsible for self-recognition, self-awareness, empathy, and symbolic activity, among other functions (Heatherton, 2011; Scalabrini et al., 2018).

In other words, trait mindfulness assumes that there is a fixed, boundary-creating self. This self is essential in trait mindfulness theory, as it allows for other psychological mechanisms related to mindfulness to exist, such as self-awareness. Trait mindfulness is therefore related to self-awareness, which is possible only because of the existence of self. This mindfulness camp diverges from the other two, which maintain different notions about the definition and roles of self.

3.1.2. Trait mindfulness and consumption

The research within this camp shows that consumers who exhibit high levels of trait mindfulness have specific ways of thinking and behaving when consuming (Schellhas et al., 2016). Most importantly, these consumers are better able to regulate their consumption and show higher temperance in consumption (Garland et al., 2012). This is driven by a more controlled attitude toward consumer behavior as well as different ways of thinking about consumption.

One explanation is that those who are mindful find meaning and satisfaction in life in activities other than consuming (Rosenberg, 2005). However, the field lacks a theoretical explanation of why consumers who are inherently mindful rely less on consumption to be happy. Our literature review shows scattered empirical evidence substantiating this account across different forms of consumption including lower use of addictive substances (Bowen et al., 2014a), fewer eating behavior problems (Paolini et al., 2012) and better financial decisions (Brown et al., 2009).

Inherently mindful consumers tend to recognize materialistic thoughts as transient phenomena and do not act on them, and they are therefore less materialistic (Watson, 2019). These consumers do not rely on material possessions to find satisfaction in life. This contrasts with nonmindful individuals, who tend to enjoy the present moment less and rely more on material possessions to find meaning in life (Watson, 2019). Mindful consumers also think differently about their financial status and material possessions. They tend to think that the gap between their current and desired financial situation is smaller than those who are not innately mindful (Brown et al., 2009).

The line of research on trait mindfulness and consumption finds that mindful consumers have greater environmental concerns and think more about sustainability (Helm & Subramaniam, 2019; Dhandra & Park, 2018). In fact, research suggests that a relationship between innate mindfulness, materialism, and well-being will stimulate the emergence of a sustainable mindset (Geiger et al., 2019). This scope on the impact of mindfulness lays the groundwork for a body of research that explores mindfulness in relation to people's desire to be a good human being, for example, by being pro-social and maintaining higher ethics (Ruedy & Schweitzer, 2010).

Trait mindfulness is seen as a protective characteristic against addictive consumption. This is the case for trait mindfulness and alcohol consumption (Bravo et al., 2016; Brett et al., 2017; Ostafin et al., 2013b; Wisener & Khoury, 2019), food consumption (Beshara et al., 2013; Paolini et al., 2012) and smartphone use (Zhang et al., 2020). For example, research suggests that there is a negative correlation between trait mindfulness and substance abuse (Karyadi et al., 2014), as mindful individuals tend to see negative thoughts and emotions as well as stimuli as transient and are less prone to react to them by consuming. These individuals also exhibit higher-order functioning, which leads to the regulation of emotions and consumption.

The relationship between trait mindfulness and substance abuse is even stronger for specific individuals and specific types of addiction (Karyadi et al., 2014). Those who already present a problematic relationship with drugs and alcohol and those who are undergoing treatment for addiction in institutions exhibit an even stronger relationship than others. Additionally, this relationship seems to be stronger for alcohol and tobacco than for marijuana.

Additional empirical evidence supports the account that consumers high in trait (innate) mindfulness rely less on consuming to be happy and are more satisfied with life (Rosenberg, 2005). Research also shows that innate mindfulness serves as a protective characteristic against depression as well as various disorders, such as excessive smartphone use among college students (Zhang et al., 2020). In other words, college students with depressive symptoms who have high levels of trait mindfulness rely less on the compulsive use of their smartphones. This corroborates findings by Bravo et al. (2016) that illustrate how consumers who exhibit trait mindfulness do not believe in alcohol consumption as a tool to treat their negative mood.

More recently, theoretical approaches to mindfulness, such as mindfulness-to-meaning theory (MMT), explain people's higher level of well-being as being due to their increased ability to decenter, reappraise a situation, have an increased positive affect, and savor the moment, including the consumption experience (Sherza, DeMarree and Naragon-Gainey 2022). Some research argues that the driver of this effect is that those high in trait mindfulness think about consumption in concrete rather than in abstract ways (Schellhas et al. 2016). Schellhas et al. (2016) explain that those high in trait mindfulness think about consuming alcohol as drinking a liquid from a glass, whereas those low in trait mindfulness associate drinking alcohol with the abstract concepts of releasing tension and having fun.

An alternative explanation to the one offered by MMT is that consumers who exhibit high levels of trait mindfulness are better at self-control (Bowlin and Baer, 2012). This would be the case because trait mindful individuals are better at self-regulating, using attention and awareness to detect discrepancies between desired and current states, as well as prompting behaviors aimed at reducing such discrepancies (Bowlin and Baer, 2012). This explanation is evidenced in the finding that consumers high in trait mindfulness also exhibit less impulsive eating, reduced caloric intake, and healthier snack choices (Jordan et al., 2014).

3.2. The second camp: learned mindfulness emerging from learned behavior

Within this camp, researchers investigate the outcomes of mindfulness practices based on the assumption that the mind can be altered permanently (Kabat-Zinn, 2003; Brown and Ryan, 2003). The assumption builds on cognitive psychology research that explores the generation of automated (or categorial) and reflective processing. Reflective processing demands cognitive effort but can become internalized with practice and repetition, freeing up cognitive resources (Ringberg and Reihlen, 2008). In this way, it seems possible that extensive repetition of mindfulness practices might become anchored in the neurological structures of the brain and thereby become permanent and not susceptible to change. The assumption that the brain can change its neurological make-up after mindfulness practice emerges from the research on neuroplasticity (Treadway & Lazar, 2010). Neuroplasticity refers to the brain's capacity to undergo lasting functional changes and changes in the connections between brain neurons (Treadway & Lazar, 2010). According to this framework, neural elements have the inherent capacity to change in all species (Shaw & McEachern, 2001) either as a result of innate development or due to external inputs, interventions, or trauma (Shaw & McEachern, 2001). Neuroplasticity takes place at different nonconscious levels until it manifests itself in changes in behavior. Tang et al. (2015) describe how several areas of the brain, such as the anterior cingulate cortex (ACC), the prefrontal cortex (PFC), and the striatum, become affected by mindfulness practices. Shors et al. (2014) construct their research on the assumption that mindfulness tacitly affects brain activity and cognition. This research uses a combination of mindfulness and exercise training, assuming that this intervention has the capacity to create new and productive neuronal networks. According to this research, there is indirect evidence that the human brain produces new neuron connections that evolve into new neuronal networks based on

effortful and ongoing learning and exercises, such as focused attention meditation (Lutz et al., 2008). However, to date, research has been unable to test whether new neurons are actually produced as a result of practicing meditation and related exercises. That this research area is still controversial is emphasized by more recent research, which has failed to find structural brain changes stemming from mindfulness interventions, such as from ongoing mindfulness based stress-reduction (MBSR) and mindfulness practices (Kral et al., 2022).

That said, it is arguably difficult to pinpoint where in the brain, such neurological changes are manifested. Moreover, neurological research increasingly argues that human cognition is largely driven by deep-seated learned automatic reactions to environmental stimuli (Bargh & Chartrand 1999, Hassin et al. 2009). Thus, it is likely that repeated mindfulness (i.e., learned) practices would lead to permanent psychological changes, similar to those resulting from therapeutic interventions, where existing unhelpful thoughts and behavioral patterns are deautomatized and then reautomatized into a new mindful format. In this way, automated behaviors, such as compulsive drinking, smoking, and eating, are unlearned and decoupled from their motivational cues and substituted by new healthy and subsequently automated behaviors (Kang, Gruber and Gray, 2014; Schultz & Ryan, 2015). This also follows research on mental models (see review by Ringberg and Reihlen 2008).

In addition to the automated (i.e., internalized) mindset, other research argues that extended mindfulness practices also lead to higher levels of awareness of self and ultimately increased control at regulating emotions (Kabat-Zinn, 2003; Wheeler et al., 2017). That is, thought content might be updated in a way that generates higher levels of kindness, self-compassion, and well-being. However, the question remains whether even relatively long-term and eventually unguided practices are sufficient to create deep reframing/learning that changes fundamental subconscious mental processing since the latter requires a substantial rewiring of the neurological substrata. Moreover, such fundamental changes and reframing often take years of one-on-one therapeutic interventions. The critics are not convinced (e.g., Van Dam, 2018), and some even argue that mindfulness practices merely represent quick fixes that raise more excitement than substantial evidence (Farias and Wikholm, 2016). Consequently, it is still controversial whether observed behavioral changes even after extended mindfulness practices are indeed caused by permanent alterations in brain processes and neurological networks and expressed in correspondingly deeply situated mental models.

3.2.1. Learned mindfulness emerging from learned behavior and the sense of self

Mindfulness research that subscribes to an emerging learned mindfulness regards self differently than that which regards mindfulness as a trait. In the emerging research on learned mindfulness, the sense of a clearly circumscribed sense of self is considered to be an illusion (Farias and Wilkham, 2016). Davidson and Lutz (2008) argue that there is an inverted U-shaped curve in brain activation reflecting that those who are highly experienced show lower levels of brain activity than those who have engaged in mid-level mindfulness practices. This suggests that the longer one practices mindfulness, the more internalized mindfulness becomes and the less effort is needed to achieve high levels of mindfulness.

A corresponding notion is dominant among practitioners and teachers of Buddhist mindfulness. Here, the main goal of practicing mindfulness is to reach a learned state of bliss and no-self enabling a cessation of all suffering as the individual leaves the self behind and attains full integration with others and the environment (Xiao et al., 2017).

Tellingly, the research on mindfulness practices that assumes such practices lead to a trait-like quality that can be called upon at will (Kabat-Zinn, 2003; Baer, 2011; Sgherza et al., 2022) has come under increasing critique. More recent research argues that this assumption is derived from studies that test practitioners only after they have learned mindfulness theories as psychoeducation in mindfulness interventions. This stimulates a learned response in the scales measuring the trait (van Dam et al., 2018).

This Buddhist view has recently found support in Western psychological research. According to scientists in theoretical psychology, in a state of no-self, having achieved mindfulness, the self is no longer attached to earthly desires as one attains the ability to experience no psychological defense mechanisms. From this perspective, attaining a learned mindfulness state leads to a reduction in the mediating role of the self. In becoming mindful, individuals are thought to experience the self as a nondelimited entity that undergoes fluid, transitory, interdependent, and dynamic change processes rather than one with more permanent characteristics (Xiao et al., 2017, p. 3).

While still viewed as a radical position, Davidson and Lutz (2008) argue that mindful individuals obtain alterations to their brain function and structure due to long-term meditative practices. They argue that the longer the practice experience, the less activation occurs in areas of the brain responsible for emotional processing. This suggests that experienced meditators show less emotional reactivity than novice meditators or those who do not meditate (Davidson and Lutz, 2008). These findings point toward a definition of *self* that is less identifiable as a fixed entity.

3.3. The third camp: mindfulness stemming from ongoing practices.

Whereas research on trait mindfulness assumes mindfulness to be an innate characteristic and the emerging mindfulness camp assumes it can be permanently achieved through extensive practice, the third camp investigates mindfulness based on either short-term or long-term ongoing practices. Everyday practices are required for temporary anchoring, and practitioners are instructed not to react to external and internal stimuli. These exercises can be based on ongoing contemplative practices, such as yoga, tai-chi and meditation, where the individual pays attention to their breathing, sounds, images, and/or thoughts and emotions. Such mindfulness practices can be either based on Eastern traditions or anchored in Western psychology (Hart et al., 2013). What these approaches have in common is the training of attention and focus on the present moment (Hart et al., 2013). What these approaches also have in common is that they do not control for the essence of innate mindfulness, thus overlooking an essential aspect when arguing for a causal relation between practice and changes in behavior. When practitioners respond to mindfulness scales after practicing, it might seem that they are more conscious and aware and that anxiety and depression are reduced. According to van Dam et al. (2018), the consequence of this is an overestimation of the outcomes of mindfulness practice and the creation of hype around it, making mindfulness seem like a panacea, a solution for every ailment in the human condition (van Dam et al., 2018). This raises the question of whether mindfulness practices in fact lead to even temporary mindfulness, and even if temporary mindfulness is achieved, whether it has any lasting effects. It is telling that none of the reviewed research papers implement longitudinal controls of the long-term effects of such practices.

3.3.1. Mindfulness: different durations of mindfulness practices

The most validated mindfulness practice within the research on the effects of mindfulness practices is an intervention called mindfulness based stress-reduction (MBSR, Kabat-Zinn, 2003). MBSR is an eight-week protocol in which participants practice different types of mindfulness practices (i.e., focused attention meditation, open awareness meditation, yoga-based exercises and exercises based on cognitive psychology) in two-hour weekly meetings. Participants practice together at group meetings, which include group discussions about their experience with the practice. When there are no follow-up meetings, they are provided with recordings to be used to practice for 40 minutes to one hour each day. The MBSR program also includes a one-day retreat where participants meet to practice together more intensely, usually on a Saturday.

The MBSR program was created in the 1970s by Jon Kabat-Zinn, and it has been successful in helping patients with chronic pain, stress, depression, and anxiety. Other programs based on MBSR have been developed, such as mindfulness-based relapse prevention (MBRP). MBRP is especially relevant for consumer research because it aims to help individuals with addictive consumer behavior regulate their consumption habits and become free from addiction. It is not known whether these outcomes in addiction are permanent or only temporary, as there is limited long-term follow-up research.

Another very popular practice is Vipassana. This is commonly practiced in a retreat context, where participants meet to practice in silence for many days. The Vipassana practice is a focused attention type of meditation; however, it is less popular among researchers investigating mindfulness practices because it is has a spiritual background, while other forms of mindfulness stem from a scientific context. Another tested intervention is mindfulness-based cognitive therapy (MBCT), which combines cognitive therapy and mindfulness practices focusing on helping patients reduce recurrent episodes of depression. This also involves an eight-week group practice. Other mindfulness interventions exist, some of which last for even less time and are employed for various consumer behavior ailments, such as a 15-minute intervention aimed at reducing caloric intake (Jordan et al., 2014) and the very short 4-minute mindfulness inductions breathing practices aimed at regulating eating behavior (Van De Veer et al., 2016).

3.1.2. Mindfulness practice and consumer behavior

The abovementioned mindfulness interventions, both long- and short-term, have given rise to what is called the third wave of cognitive therapies, which include acceptance-based therapy (ACT) (Hayes and Strosahl, 2005). These therapies are used by researchers, clinical psychologists, doctors, and nutritionists to help individuals regulate various negative consumption habits. Below, we review these findings. We first review the effects of long-term interventions, such as MBSR and related practices, and then those of short (i.e., 4–20 minutes long) mindfulness practices.

Mindfulness practice is found to regulate addiction and consumption, such as cigarette consumption (Tang, 2017; Tang et al., 2015), food consumption (Manku et al., 2020), and the consumption of other substances (Bowen et al., 2014). The psychological mechanisms through which this happens are based on how mindfulness practices lead to a higher awareness of thoughts, emotions, feelings, and body sensations (Tang 2017). After practicing mindfulness, consumers register internal stimuli before they become fully conscious. In this way, consumers cultivate the ability to notice when cues for consumption enter awareness, and they can halt otherwise automatic behaviors of consuming food, alcohol, other substances, and/or electronic media. While it initially requires attention and awareness to work through a decoupling of automatic addictive behaviors from their internal and external cues (Tang, 2017; Brewer, 2019) over time, the conscious intention to regulate consumption subsides and is replaced by and ruled by a restructured reward system.

MBRP (mindfulness-based relapse prevention), an adaptation of MBSR, is typically used to counteract addiction and is taught to individuals who need to resist consumption urges and cravings, as well as self-regulate (Tapper 2018, Tapper 2017). Tapper (2018, 2017) explains that cravings occur through the activation of memories associated with cues that signal consumption. These cues may be external or internal, physiological, or emotional. The argument is that when a person focuses his or her attention on the present moment by practicing mindfulness, the mind stops elaborating on consumption memories. These changes in mind should eventually reduce the intensity and duration of cravings.

Will-power theories are, from the mindfulness perspective, insufficient to solve the problems of malefic consumption. Will-power demands that the consumer fights an internal battle between urges to consume and wishes not to do so. Most of the time, the habitual, automatic urge wins the battle, as it has been reinforced longer and more intensely than the healthy and wished-for behavior. The solution behind mindfulness practices is that the consumer learns to 'ride the horse' of desire and redirect it instead of fighting it (Brewer, 2019). This is the contribution of Buddhist teaching and Buddhist psychology to modern Western psychology. In these ancient teachings, where mindfulness is viewed as a key factor, desire is regarded as harmful for reaching enlightenment, and many mindfulness practices were originally thought to clear the mind from the illusionary satisfaction sparked by uncontrolled desires.

A practice related to the ride-the horse of desire approach is that of urge-surfing (Bowen & Marlatt, 2009). Here, compulsive consumers are instructed to picture the urge to consume as a wave they are riding. Instead of fighting the urge or giving in to it, individuals experience the urge in a fluent and detached manner by 'observing' their feelings and emotions. Bowen and Marlatt (2009) find evidence that urge-surfing reduces nicotine intake in a seven-day follow-up cycle among smokers attempting to quit and moderates the relationship between positive affect and nicotine intake.

It is worth mentioning that relaxation techniques have been observed to provide somewhat similar effects as mindfulness practices. For example, Kamboj et al. (2017) found that while the reduction in craving for alcohol was greater in a relaxation group versus a long-term mindfulness intervention group, the reduction in past-week alcohol consumption on follow-up seven days after the intervention was greater for the mindfulness practice group than for the relaxation group. However, mindfulness and relaxation stem from different assumptions about the workings of the mind as well as different techniques. While in mindfulness, one is taught to accept internal states, in relaxation practices, one becomes better able to change internal states (Luberto et al., 2020).

Some research still finds beneficial effects of short-term mindful practices, at least when measured immediately after the practice. In a study by Orazi et al. (2019), the authors find that individuals can learn to regulate their attention based on a short 15-minute induction and thereby resist intruding thoughts and emotions. This enables additional cognitive resources to become available, which gives individuals more time and energy to engage in pro-social

behavior with others. Brief exercises lead to pro-social behavior such as volunteering, donating, and ethical consumption (Orazi et al., 2019). Another example is presented by Jordan et al. (2014) and Dutt et al. (2019), who found that a short, 15-minute practice session causes individuals to choose a healthier food group. Again, and somewhat disconcertingly, none of this research measures whether these effects are long-lasting in lieu of mindfulness practices. In other words, research on the effects of mindfulness practices measures only the immediate effects generated by these practices and does not control for participants' level of innate mindfulness.

3.1.3. Mindfulness practice and the sense of self

Mindfulness practices are viewed as affecting individuals' 'state of consciousness' with higher or lower levels of awareness and attention toward different situations (Brown and Ryan, 2003). The argument is that an improved state of mindfulness leads to a better regulated self, which improves individuals' ability to employ volitional control of desires and attain higher levels of well-being (Schultz and Ryan, 2015).

Regulating the *self* requires heightened awareness (Schultz and Ryan, 2015) and intentions (Shapiro and Schwartz, 2000). Those who are aware know that they are breathing and when they are breathing; they know what they are thinking about and when they are thinking; and they know that they are in pain and when they are in pain. Intention setting is a dynamic process of reflecting on *why* one practices mindfulness and on one's goals in doing so. The theoretical position is that intentions become broader and more connected with an actualized self with continuous mindfulness practices (Shapiro et al., 2006). Although individuals might start with the intention of healing their anxiety and quitting smoking, as the practice becomes more encompassing (with an increased awareness of the philosophical aspects of mindfulness), it leads to an understanding that one is part of a greater whole and connected to other human beings as well as other beings in nature (Shapiro and Schwartz, 2000).

Mindfulness practices therefore might lead to less ego-involvement and more autonomous self-regulation (Schultz and Ryan, 2015). The sense of self in individuals who engage in such practices is less associated with internalized, culturally defined notions of self. In this sense, the *self* is seen as a process that allows some individuals to grow and search for actualization,

which, in turn, leads to higher levels of vitality and decreased pressure and tension, along with less reactivity to stressful situations (Schultz and Ryan, 2015). However, the question remains of how permanent these states are (Bravo et al., 2018). Research has found that mindfulness states are not always correlated with mindfulness traits (Bravo et al., 2018). In other words, ongoing practices are required to maintain higher levels of mindfulness traits and a mindful self. This suggests that the sense of no-self (or a less ego-involved self) in this camp of mindfulness research depends on ongoing practices and likely pertains only to a minority of mindfulness practitioners.

4. Discussion

Our review of the literature reveals interesting insights into the field of mindfulness, yet it also reveals problematic areas. While findings from some of the mindfulness research initially appear promising and lead to protection against many types of consumer behavior ailments, upon closer examination, several issues emerge:

1. Can personality traits change over time?

2. There is a lack of trait mindfulness control among participants in the mindfulness practice research. Are the effects found in the research based on the practice of mindfulness or due to the presence of participants with innate mindfulness who have not been eliminated due to a lack of controls?

3. There is also a lack of control of the longitudinal (lasting) effects of mindfulness practices (with and without ongoing practices).

4. Moreover, there is a lack of control of learning effects on longitudinal effects.

5. There are consistencies and inconsistencies between trait and practiced mindfulness in the regulation of consumption outcomes. This raises the question about the role of decentering.

6. What is the relationship between a mindful *self* and the regulation of consumption?

7. What is the relationship between mindfulness and sustainable behavior?

8. Finally, how do the different concepts of mindfulness and the self relate to consumer self-regulation?

4.1. Can personality traits change over time?

The first question is whether personality traits can change. It is a major assumption in the mindfulness field that the practice of mindfulness will increase the levels of trait mindfulness in individuals (Brown & Ryan, 2003; Kabat-Zinn, 2003). This assumption motivates most of the research and funding toward studies in trait mindfulness. The logic is that if research finds promising outcomes in trait mindfulness, one can extend such findings to practiced mindfulness, as the latter is seen as leading to the former.

Theories on personality traits, however, challenge this assumption by stating that traits are relatively stable throughout life (Weiss & Deary, 2020). Traits are deeply imbedded in one's mind and reflected in one's thoughts, feelings, and behavior, and they are therefore difficult to change. This is due to the role of genes and internal maturation in personality traits (Bleidorn et al., 2018).

Other lines of research, however, find that personality traits can change after significant life events (Bleidorn et al., 2018) and/or clinical interventions, including mindfulness practice (Roberts et al., 2017). Life events are conceptualized as "time-discrete transitions that mark the beginning or end of a specific status" (Luhmann et al., 2012, p. 594) and demand new behavioral, cognitive, and emotional efforts (Hopson & Adams, 1976).

However, among those who defend the idea that trait personality change is possible, there is an understanding that effect sizes are quite small and that the methodology of the research in interventions and personality trait change exhibit shortcomings, with no comparison or control group in the experiments (Roberts et al., 2017). There are two accounts of personality change: the *cause-correction hypothesis*, which asserts that changes in personality stem from changes in traits, and the *state-artifact position*, which states that changes stem from state variations and not deep variations in traits (Roberts et al., 2017). It would therefore be difficult to measure whether changes in personality are a result of deep trait variations or state variations, or even

both. In the case where both can vary, researchers do not know how much change is attributable to state and how much is attributable to trait.

Additionally, some research shows that mindfulness-based interventions (MBIs) are particularly effective for specific personality profiles in individuals who do not have innate mindfulness. A meta-analysis of 209 studies on the effectiveness of mindfulness-based therapy found that only 45% of all studies measured trait mindfulness (Khoury et al., 2013). Krik and Felfe (2020) find that police officers who score high on neuroticism and openness benefit from a mindfulness intervention, yet the study does not state (or measure) how long this effect lasts. This is also true for individuals with a favorable social norm with regard to MBIs. Other research suggests that positive psychology interventions are more beneficial for those who show high levels of trait mindfulness (Seear and Vella-Brodrick, 2013).

Researchers, therefore, must still understand when and for whom mindfulness practices are beneficial, as well as whether those with higher levels of trait mindfulness need to engage in such practices. This poses a challenge to the assumptions in mindfulness research that mindfulness practice causes a change in mindfulness traits. Additionally, our review finds that a major portion of the mindfulness practice and consumption literature does not measure the presence of trait mindfulness before and/or after a mindfulness practice intervention. It is therefore impossible to know whether the outcomes of these interventions are caused by a preexisting innate trait or whether they are the effects of mindful practices among individuals with no such innate trait.

4.2. Lack of trait/innate mindfulness control among participants

We reviewed the literature on mindfulness and consumption and categorized the articles according to their assumptions about how mindfulness emerges and whether outcomes differ depending on whether mindfulness is an innate or temporarily acquired skill. Surprisingly, only 33% of the papers on mindfulness practices control for the presence of innate mindfulness before (or after) an intervention (Böhme et a., 2018; Davis et al., 2013; Gupta and Verma, 2019).

This is a major shortcoming in the mindfulness literature, as it means that most of the research cannot assert whether the outcome variable truly changes as a result of mindfulness practice or

if the observed change is simply a result of the presence of an innate mindfulness state within some of the participants. In other words, the results could be due to the stochastic presence of innate mindfulness in the participants. For example, this would be the case for findings related to research on mindfulness and eating behavior (Dutt et al., 2019; Chang et al., 2018; Järvelä-Reijonen et al., 2018) as well as alcohol and substance abuse recovery (Bowen et al., 2007; Bowen et al., 2014). This is unfortunate, as it is likely to generate misleading implications for consumers as well as policy-makers in making decisions about how to treat problems related to overconsumption.

4.3. Lack of control of the longitudinal (lasting) effect of mindfulness practices (with and without ongoing practices)

Another shortcoming in this literature is the overestimation of the potential of mindfulness practices in terms of their lasting usefulness in behavioral outcomes.

Studies have clarified that such effects disappear over time, even with ongoing practices. A four-year follow-up study found that mindfulness scores persisted over time after the intervention but not well-being effects (Solhaug et al., 2019). It is therefore possible that some of the effects disappear over the long term due to the adaptation of neurons to mindfulness practices, akin to Troxler's fading effect shown in the visual system. The Troxler effect is named after the Swiss physician and philosopher Troxler (1780-1866). For example, if a small piece of paper is dropped on the inside of one's forearm, it is felt for a short period of time. Soon, however, the sensation fades away. This is because the tactile neurons have adapted. That is part of the general principle in sensory systems, i.e., that unvarying stimuli soon disappear from our awareness. We do not mean to say that mindfulness practice does not have an effect on these outcomes but, rather, that researchers, policy-makers, and consumers need to change their methodological approach to ascertain whether mindfulness practices indeed lead to the claimed outcomes.

4.4. Lack of control of the learning effect when answering questions about longitudinal effects

Mindfulness practice interventions include sessions in psychoeducation that expose participants to teachings about mindfulness. These sessions could lead participants to respond to mindfulness scales in a way that makes it seem like they are experiencing increases in mindfulness but in fact only measures participants' ability to learn how to respond to mindfulness scales during the interventions (van Dam et al., 2018). This would presumably be less problematic for short interventions but more problematic for long-term programs such as MBSR, MBRP, and interventions aimed at promoting ongoing positive consumer behavior, such as sustainable behavior. The outcomes of these interventions should therefore be analyzed with a critical eye, with the goal of separating the effects from the experiential aspects of mindfulness from the effects of psychoeducation. This could be achieved with subconscious measures of the effects of mindfulness, such as neurobiological research techniques.

4.5. Consistencies and inconsistencies between trait and practiced mindfulness in the regulation of consumption outcomes: the role of decentering

Taken together, the findings in both trait mindfulness and mindfulness practice research suggest that both types of mindfulness lead to lower levels of addictive consumption behavior (of course, temporarily disregarding our abovementioned caveats).

The explanations of the links between mindfulness and consumption differ within the research on trait mindfulness and practice mindfulness. On the one hand, those with innate mindfulness and who exhibit problematic consumer behavior tend to view their negative thoughts and emotions as transient because of higher levels of trait mindfulness (Karyadi et al., 2014). This innate characteristic protects them against more severe addiction. On the other hand, in regard to mindfulness practice, being able to bring consumption cues into the level of awareness and attend to them seems to prevent negative consumption behavior, but only in the short run (Tang, 2017; Brewer, 2019).

The research in both trait and learned mindfulness discusses the psychological mechanism called decentering. Decentering consists of the conscious monitoring and shifting of attention between different thought perspectives, including stepping away from an experience and looking at it from a mental distance (Bernstein et al., 2015). In this mental space, information

can be dissociated from immediate reactivity. In both the trait mindfulness and mindfulness practices research, the mental space is shown to enable decentering to occur and to change the course of consumer behavior. The mental space requires consciousness and effort in the early stages of mindfulness training (Creswell, 2017) but presumably becomes more automatized and naturally present in the minds of consumers through practice over time (Tang, 2018; Tang, Hölzel and Posner, 2015).

4.6. The mindful *self* and the regulation of consumption

The three camps of mindfulness identified in this article apply different conceptions of the *self*. The mindfulness practices camp assumes the presence of an intentional self-regulating *self*. The learned mindfulness camp assumes that there is no *self*, while the trait mindfulness camp assumes a boundary-creating *self*.

Within the learned mindfulness camp, the notion of self follows Buddhist traditions and focuses on self-regulation through the dissipation of desires. Within the trait mindfulness camp, the notion of *self* requires active self-control. In addition, in the camp in which mindfulness stems from ongoing practices, *self* is viewed as having an intrinsic motivation to regulate consumption. These sources of self-regulation through different conceptualizations of the *self* leave the reader with different understandings of how mindful self-regulation works. It is puzzling that such different conceptualizations of the role of self exist across the mindfulness research. This raises the question of whether mindful behavior is a result of the reduction of desire, an increase in control and motivation/intention, or a dissociation of the self. Answers to this question can provide consumer psychologists with a better understanding of how to affect consumer behaviors. Future research must establish a deeper understanding of the roles of self or nonself in achieving mindfulness. It must also establish whether there is a causal link between mindful practices and an emerging sense of self. Moreover, it must determine whether it is the sense of self and its connected (lack of) self-regulation that leads to different behavioral outcomes.

Further complicating the role of self and intention is Tang's (2017) argument that an intended behavior does not necessarily require mindfulness. In contrast, in a meta-analysis, Webb and

Sheeran (2006) find that a medium-to-large change in intention leads to a small-to-medium change in behavior. Similarly, Shapiro et al. (2006) argue that intentional behaviors require mindfulness practice and that this is what gives rise to the notion of the regulated *self*. That said, other research suggests that mindful self-regulation can lead to a reduction in desire and an increase in control. Remarkably, a broad line of research focuses on the intersection between mindfulness and self-control, and much less is known about the intersection of mindfulness and the management of desires (Redden and Haws, 2012). That is, desires, impulses, and urges play an important role in the breach of self-control experienced by consumers (Redden and Haws, 2012), yet there is little research exploring how to reduce desires through mindfulness practices.

4.7. Mindfulness and sustainability

The research establishing a positive influence of mindfulness on sustainability suffers from an overestimation of its potential benefits. Longer-term mindfulness practices, such as MBSR, are adapted with the goal of sparking more sustainable behavior. However, in this review, a main contradiction emerged between trait mindfulness and mindfulness practices. For example, in an intervention with university students and employees based on mindfulness practices, Geiger et al. (2019) did not find an effect on increased sustainable behavior and related attitudes or even a reduction in the attitude-behavior gap in regard to sustainability based on increased mindfulness practices. Similarly, an adaptation of MBSR with school children found only minor effects in increasing sustainable behavior (Böhme et al., 2018). Consequently, Geiger et al. (2019) critically examined findings that suggest otherwise and concluded that most evidence linking mindfulness to sustainable behavior stems from trait mindfulness and not from mindfulness practices. In other words, those who score high on innate mindfulness tend to exhibit more sustainable behavior than those with a low score despite practicing mindfulness.

A series of research initiatives that attempted to test the effects of mindfulness practices on sustainable behavior (Boehme et al., 2018; L. Stanszus et al., 2017; L. S. Stanszus et al., 2019) show that although related variables, such as materialism and well-being, were affected by the practices, no evidence emerged that pointed to an increase in sustainable behavior by these interventions (Geiger et al., 2019).

While it has been shown that mindfulness leads to a reduction in materialism and an increase in well-being, which has created optimism in the field, more critical research points to the many caveats within this body of research and the need for studies that establish a clearer causal link as well as establish whether such causality is linked to innate and/or practiced mindfulness (Thiermann & Sheate, 2021).

5. Conclusion

This paper aims to clarify the field of mindfulness and its effect on consumption behavior. In doing so, it identifies three camps and two types of mindfulness present in the literature, namely, mindfulness based on either innate/trait characteristics or obtained through learning and practice. The analysis found that trait mindfulness and mindfulness practices have been put under the same umbrella and thus are not controlled for in most research papers, even though they rely on very different assumptions about how mindfulness is established.

While innate mindfulness is the focus of personality research and is thought to be a stable characteristic, the focus on mindfulness practices originates from within Western philosophy and more recently in cognitive psychology. Here, it is assumed that mindfulness requires ongoing practices and can eventually be internalized over time. The literature seems to be largely oblivious to the difference between these forms of mindfulness and perhaps therefore has neglected to control for the presence of innate mindfulness within subjects when testing the effect of mindfulness practices. The understandings of the concept of self are also fundamentally different within the three camps of mindfulness ranging from self as the proponent of change to one for which the notion of self is dislodged to achieve mindfulness and changes in behavior.

This paper contributes to marketing theory by classifying and theoretically explaining mindfulness as it relates to the field of consumption. Additionally, our review reveals contradictions in findings between the three camps and two types (i.e., innate vs. practice-based) of mindfulness. Moreover, policy-makers reading this paper should note that mindfulness practices might not be a panacea for problems in consumers' negative behavior, especially in regard to improving pro-ecological, pro-health, and pro-environmental behavior. Thus, care is advised when promoting mindfulness practices as an intervention. It might simply be that it is only innately mindful people who drive the results of most of the mindfulness research findings

on mindfulness practices. Finally, in a world where mindfulness is becoming a popular practice, marketeers should be mindful in considering the effects of mindfulness.

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Article 2

Impact of Mindfulness Meditation on Consumption Under Uncertainty:

When Mindfulness Increases Virtues and Reduces Vices in Consumption

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Abstract:

Uncertainty elicited by financial and sanitary crises leads to higher indulgent consumption and lower self-control, consequently lowering consumer well-being. This paper investigates the role of mindfulness meditation in countering this effect. Drawing on contradictory findings, we test competing hypotheses regarding whether mindfulness meditation increases or decreases self-control under uncertainty. Conducting two quasiexperiments and one pretest, we reach contradictory findings. In one study, mindfulness did not lead to higher self-control under uncertainty, whereas in the second study, mindfulness meditation increased consumers' self-control under uncertainty. Furthermore, the pretest indicated that mindfulness meditation impacts ego depletion. These findings contribute to the literature by introducing mindfulness meditation as a boundary condition in the effect of uncertainty on consumption. More studies should be performed to clarify inconsistencies in our findings and establish under which conditions mindfulness leads to higher or lower self-control under uncertainty.

Keywords:

Mindfulness, meditation, self-control, vices, uncertainty

1. Introduction

Consumers frequently face uncertainty in their daily lives, and coping with it can have negative sociopsychological effects (Braun & Zenker, 2022). The detrimental role of uncertainty in consumption has been addressed in the business literature, where Milkman (2011) found that uncertainty leads to a higher preference for indulgent (*want*) than healthy (*should*) food options. During the 2008 financial crisis, consumers turned to candy consumption to cope with uncertainty. More recently, the COVID-19 pandemic has illustrated a similar phenomenon. Extensive lockdowns were enforced with no clear deadlines, lives were lost, and financial insecurities were created for many people. These uncertainties caused new and different consumption practices, such as the hoarding of toilet paper (Kirk & Rifkin, 2020), an increase in alcohol consumption (Barbosa et al., 2021), and changes in patterns of food consumption (Bracale & Vaccaro, 2020). Although uncertainties permeate many consumers' daily lives, there are times when they are particularly salient. These include periods of global crises such as the 1930s depression or, more recently, the 2008 financial Crisis, and the 2019 COVID pandemic. In these historical periods, there was high perceived uncertainty concerning the future, and consumer behavior was affected by this uncertainty (Milkman, 2011).

Existing research suggests that the effect of uncertainty on indulgent consumer behavior can be explained by ego depletion theory (Baumeister et al., 2018). According to ego depletion theory, self-control works as a 'muscle' that can be both trained and worn out with use. Coping with thoughts and emotions about the future can strain the self-control 'muscle' and deplete the ego (K. Milkman, 2011). As self-control is a limited resource, consumers faced with uncertainty have a lower capacity to resist products that provide immediate physical and psychological rewards and consequently engage more easily in indulgent consumption. Our research introduces and empirically examines a novel way to break this negative causal link between uncertainty, ego depletion, and indulgent consumption, specifically, by practicing mindfulness meditation. In recent years, consumer researchers across different scientific fields have demonstrated that mindfulness meditation can help consumers control their consumption of indulgent products, such as cigarettes (Tang, 2017; Tang, Hölzel, et al., 2015) and food (van de Veer et al., 2016). One of the explanations for these findings is that mindfulness meditation

counteracts ego depletion (Friese et al., 2012a), which in turn may reduce indulgent consumer behavior. There is, however, competing evidence that mindfulness demands effort (Creswell, 2017), which can lead to a subsequent increase in ego depletion.

We draw on these competing insights to test whether mindfulness reduces or increases indulgent consumption under uncertainty. Importantly, no research has examined the effect of mindfulness on indulgent consumption under uncertainty. However, as we have indicated, uncertainty is omnipresent in many consumer decisions; hence, examining uncertainty is important. Specifically, building on the energy (i.e., 'muscle') model of self-control (Baumeister et al., 1994), we empirically examine two alternative pathways through which mindfulness can shape consumer behavior. First, it is possible that mindfulness meditation will replenish the self-control 'muscle' and allow for a greater capacity to resist indulgent consumption under uncertainty. Second, it is also possible that when practicing mindfulness meditation, consumers will exert effort that leads to ego depletion and impairs their capacity for self-control.

To test the role of mindfulness in consumer behavior under uncertainty, we perform three experimental studies. We start with a pilot study in which we establish an effect of mindfulness meditation on ego depletion, followed by Studies 1 and 2, in which we investigate consumers who regularly practice mindfulness meditation and their capacity to resist indulgent consumption under uncertainty. Our findings point to the potential of mindfulness meditation to reduce indulgent consumption under uncertainty. This is achieved through the reduction of ego depletion when meditating. In the pilot study, we experimentally induce two weeks of mindfulness meditation practice and find that meditation leads to a reduction in ego depletion. In Studies 1 and 2, we document that under uncertainty, those who practice mindfulness meditation frequently tend to resist indulgent consumption (food and entertainment choices) more often than nonmeditators.

These findings have both theoretical and managerial implications. We contribute by showing how mindfulness meditation operates as a boundary condition during the *want/should* dilemma under levels of uncertainty. Specifically, we do this by theoretically and empirically linking mindfulness and ego depletion. Furthermore, we contribute to policy-makers seeking to help consumers improve their self-control in uncertain contexts, such as during pandemics and other and global crises, by introducing mindfulness meditation practices. Finally, this paper contributes to the marketing and consumer psychology community by introducing mindfulness

as a tool for consumers to regulate malefic consumption during crises of uncertainty, as well as furthering researchers' understanding of how mindfulness and uncertainty interact. Over the last decades, the marketing community has become interested in counteracting malefic consumer behavior, and our findings show that mindfulness is an ally in this process.

2. Theoretical background

2.1. Self-control theory

Self-control involves the capacity to resist impulses and temptations, achieve long-term goals, and behave in line with one's values and social expectations (Baumeister et al., 1994; Moffitt et al., 2011). Lower levels of self-control are associated with a range of personal and societal issues, such as psychiatric disorders, excessive consumption, and lower academic performance (Tangney et al., 2004). Conflicts in self-control are illustrated as the *want/should dilemma* (K. L. Milkman et al., 2008) or choices between *virtues* and *vices* (Read et al., 1998). The literature describes human beings as having two competing decision-making selves: the *want* self that is focused on the here and now and strives for instant gratification and the *should* self that is focused on long-term goals (K. L. Milkman et al., 2008). The dilemma is exemplified in the Christian model of a good life, where a life of virtuous behaviors on Earth leads to the ultimate reward of an existence in Heaven, whereas a life of indulgence leads to an after-life of suffering in Hell (Read et al., 1998).

Going beyond the Christian view, the authors in the field refrain from indicating which pattern of choice is better but explain decision-making in terms of utility. The optimal choice would be the one with the higher discounted net utility, reflecting the choice that can have greater utility considering the present and all future periods (Milkman et al., 2008). When short-term benefits outweigh long-term gains, the *want* option is rational. It is, however, known that people tend to regret irrationally overindulging in *want* choices, which has generally greater costs than choosing *should* options (Bitterly et al., n.d.)

Baumeister et al. (1994) describe the energy model of self-control. The analogy they employ is that of a 'muscle' that gets tired when used but can be trained to endure higher demand. Making

the decision of whether to indulge or abstain from immediate gratification demands volition and executive function, a phenomenon whereby the self acts consciously and autonomously on its own behalf (Baumeister et al., 2018). Executive function is an important aspect of the mind that leads to long-term health, well-being, and success, and theorists dating back to Freud state that exerting volition demands energy (Baumeister et al., 1998). When decisions are made, the limited amount of energy available to make them is used, and the ego becomes depleted. Certain practices, on the other hand, have the power to replenish the ego, generating more energy. While exerting self-control in one task can reduce willpower in a subsequent task, exerting self-control in one area of life can also lead to an improvement in other areas in the form of a reduction in the rate of ego depletion (Baumeister et al., 2007).

In a meta-analysis of 83 studies, Hagger et al. (2010) found that ego depletion has a medium-to-large average effect size. The authors conclude that self-control is an effortful and aversive task and that ego depletion influences effort, perceived difficulty, negative affect, and subjective fatigue (Hagger et al., 2010). Carter et al. (2015) challenge the idea of ego-depletion based on a second meta-analytic paper. These authors address the limitations present in previous meta-analyses and suggest that self-control is not based on a limited set of cognitive and physical resources. Alternative explanations of self-depletion have emerged (Inzlicht et a., 2014), but they are beyond the scope of this paper.

3. Hypothesis development

3.1. Mindfulness and its role in shaping self-control

The extant literature suggests that mindfulness impacts self-control, either positively by counteracting ego depletion or negatively as an effort-demanding practice. Mindfulness is most widely defined as “awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally” (Kabat-Zinn, 2003). Three main mechanisms are involved in mindfulness: intention, attention, and attitude (Shapiro et al., 2006). Intention refers to *why* one practices mindfulness; it is a motivation that guides and sets the tone for the practice. With that intention in mind, one focuses one’s *attention* on the present moment. Attitude

refers to *how* one attends to points of attention, thoughts, and emotions with compassion and loving kindness.

In the literature, mindfulness is an overarching term that either refers to the practice of mindfulness meditation or represents the personal characteristic (trait) of living life mindfully (van Dam et al., 2018). It is known that practicing meditation leads to higher levels of mindfulness as a trait (Kabat-Zinn, 2003). Mindfulness can also be divided into creative and meditative mindfulness (Hart et al., 2013), where the first refers to openness and creativity and the second to a set of interventions that involve meditative practices rooted in Eastern traditions. Meditative mindfulness is broader in scope and can encompass creative mindfulness (Hart et al., 2013). In the present paper, we focus on mindfulness meditation habits through the lens of meditative mindfulness.

It is known that mindfulness meditation can affect consumer behavior and self-control (Friese et al., 2012b). It is not known, however, how it affects decision-making under uncertainty. Contrary to classical economic theory, it has been found that human beings tend to err (Tversky and Kahnemann, 1974; 1980) and fail to maximize long-term rewards (Gilboa, 2009) under uncertain conditions. This also applies to consumption decisions where self-control is needed. In a series of studies, Milkman (2012) found that when faced with uncertain (unpredictable and uncontrollable) situations, consumers prefer to indulge and tend to lose their inhibitory abilities. Milkman (2012) explains that this happens because, when faced with an uncertain outcome, consumers tend to wonder about the possibilities of what will happen in the future. Thoughts and emotions about long-term consequences are generated but tend to be suppressed if the consumer wants to make a decision. This suppression is energy consuming, depleting the brain's capacity for self-control. Therefore, after the consumer experiences uncertainty, their brain is left with little capacity for self-control in subsequent decisions.

Mindfulness meditation is known as both an activity that counteracts ego depletion and as an activity that demands effort and therefore leads to ego depletion. In the next sections, we present evidence and explanations for both views. The present paper aims to test and resolve these competing hypotheses in the following experiments.

3.2. Mindfulness as a means to increase self-control

Some research indicates that mindfulness meditation counteracts ego depletion. In an investigation of the effects of short-term mindfulness meditation practices, Friese et al. (2012b)

found that such practices counteract ego depletion between two subsequent self-control tasks. Mindfulness meditation also has fewer cognitive costs than other strategies of self-regulation. In a study comparing reappraisal and mindfulness meditation, Keng et al. (2013) found that although mindfulness meditation and reappraisal are equally effective in reducing a sad mood, mindfulness depletes fewer resources than reappraisal. Additionally, neuroscientific studies have found that mindfulness meditation positively affects the regions of the brain involved in self-control, leading to a reduction in addictive behaviors (Tang, Posner, et al., 2015). Mindfulness counteracts ego depletion because it leads to deep relaxation that boosts self-control (Friese et al., 2012b). According to Francis and Inzlicht (2016), this is because only effortful, unpleasant experiences lead to ego depletion. From this perspective, practicing mindfulness may lead to a pleasant experience that replenishes energy.

3.3. Mindfulness as a means to decrease self-control

The alternative hypothesis is that mindfulness leads to ego depletion. Mindfulness meditation involves focusing on an object of attention (e.g., the breath, sounds, thoughts or emotions) and resisting the urge to let the mind wander. It is a repetitive process of attending to an object, getting lost in distracting thoughts, coming to realize that the mind has wandered, and finally bringing attention back to the chosen object of meditation. Furthermore, meditation involves the counter habitual practice of being silent with one's thoughts and emotions, which can be quite effortful and challenging (Creswell, 2017). Because effortful tasks lead to ego depletion (Francis & Inzlicht, 2016), the practice of mindfulness can also hinder performance on subsequent tasks (Creswell, 2017).

Drawing from our literature review, we propose that meditators will have a different choice pattern than nonmeditators when faced with a consumption decision under uncertainty. We draw a set of competing hypotheses. First, we propose that those who meditate regularly will present less ego depletion under uncertainty and that they will be able to exert self-control in decision-making.

Mindfulness meditation leads to positive emotions and a general feeling of well-being (Brown & Ryan, 2003). It can be said that this happens because of the general reduction in stress stemming from meditation and mindfulness (Creswell & Lindsay, 2014). In stressful situations,

cortisol is released in the body; however, when one meditates, there is a deactivation of the stress response. That will lead consumers who meditate to feel better and increase their resources for self-control.

Alternatively, we hypothesize based on Shapiro et al.'s (2006) paper that meditation demands effort, which will lead to ego depletion and lower self-control. In this alternative account, meditation is seen as an effortful activity that only yields relaxation benefits in the long run. That would happen because meditation demands attention and focus, which are effortful activities. Following this perspective, meditation would deplete resources and prevent them from being used in activities demanding self-control.

H1a: Meditation leads to lower ego depletion and higher self-control under uncertainty.

H1b: Meditation leads to higher ego depletion and lower self-control under uncertainty.

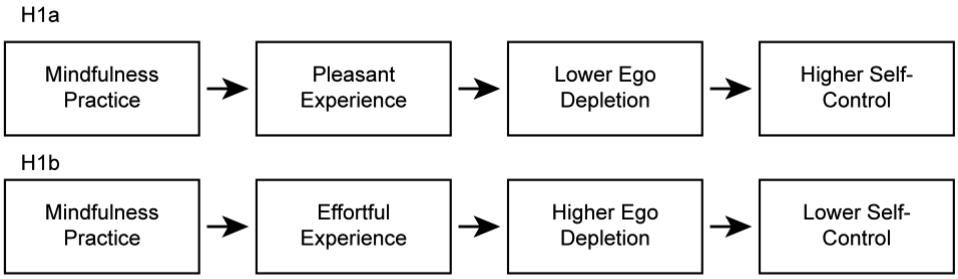


Figure 1

To test the propositions above, we performed a pilot study in the lab and a series of quasiexperimental online studies (Studies 1 and 2). Below, we describe these studies and their results.

4. Pilot study - the effect of mindfulness meditation on ego depletion

We began testing our propositions with a test of mindfulness meditation on ego depletion and self-control under uncertainty. We set up a pretest to serve as a framework for future lab studies with larger samples and power.

4.1. Design and method

A convenience sample of 28 participants was recruited at a European campus and online. Two participants dropped out of the study between the first and second tests, and the final sample consisted of 26 individuals (96.15% female, average age 26.12 years) who joined the study in exchange for a gift card of DKK 100. The experiment consisted of two meetings, two weeks apart, and the participants were asked to listen to a 15-minute meditation audio ***once a day between the two lab sessions***. The meditation recording was the same as that used in the mindfulness condition in (Hafenbrack et al., 2014).

In the lab sessions, the participants were given a scratch-off lottery ticket where they had the chance of winning DKK 100. The participants were told that they should only scratch the ticket and learn if they had won the prize after filling out a questionnaire on a computer. This served as a way to induce uncertainty among the participants. The questionnaire consisted of a MAAS scale and a test of ego depletion adapted from Milkman (2012). The ego depletion measure ranged from 0 to 63 in a task consisting of a set of 63 addition problems with 3-digit numbers. The participants were given 10 minutes to complete the task and were free to solve as many problems as they wished as well as finish before completing the list or before the task time passed. Persistence in the task was measured by the number of problems solved by each participant.

After the questionnaire was completed, the participants were offered to take as many miniatures of Kinder chocolate as they wished from a bowl of 10 miniatures. This was the dependent measure of the study. In the first session, the participants were then sent a recording with instructions for home practice as well as the time and date of the second session. To the best of our ability, we scheduled the second session so it corresponded with a similar date and time of the week as the first session. In the second session, the same procedures were repeated, and the participants were given their reward and debriefed by the researcher.

4.2. Results and discussion

The participants said they listened to the meditation recording an average of 9.88 days between the first and the second test sessions, indicating that they complied with our instructions. The participants in the first session (T1) took an average of 1.15 chocolates each (sd = 0.543), and the participants in the second session (T2) took an average of 1.08 chocolates each (sd = 0.688). The data on the participants' interactions with the chocolates were not normal, refuting one of the assumptions of the repeated-measures ANOVA. We therefore ran a Friedman test, which is the nonparametric version of a repeated-measures ANOVA, to test if there was a difference between T1 and T2. There was no significant difference between the number of chocolates taken at T1 and T2 ($F = 0.143$, $df = 1$, $p = 0.705$).

We then analyzed the impact of meditation practice on the measure of ego depletion.

We tested for outliers and the normality of the data, as these are assumptions of the repeated-measures ANOVA. There were no extreme outliers, and the data followed a normal distribution. We then performed repeated-measures ANOVA. There is a marginally significant difference in ego depletion between T1 ($\mu=33.9$, $\sigma = 17.3$) and T2 ($\mu=38.7$, $\sigma = 18.4$, $F = 3.139$, $df = 1$, $p = 0.089$).

We also tested whether the levels of mindfulness before and after the intervention changed. The MAAS scale (Ryan and Brown, 2003) was used, where a higher number reflects higher levels of mindlessness. Measurements were performed before ($\mu=3.28$, $\sigma = 0.744$) and after ($\mu=3.31$, $\sigma = 0.887$) the meditation period, and we found that, contrary to expectations, mindfulness was reduced after the intervention ($df = 25$, $t < 0.001$). This may have happened because the intervention was too short to generate an alteration in the scale and because the participants had little meditation experience, which can generate higher levels of effort in the practice (Creswell, 2017), possibly reducing its effects.

One can therefore conclude that there is a marginally significant effect of meditation on ego depletion. This effect is in line with H1a, which predicts that meditation will help consumers resist ego depletion, as they were better able to persevere on the set of math problems they were asked to solve. This partially significant effect does not have the strength to affect the chocolate consumption variable. However, there are alternative ways to measure the consumption of hedonic food that could have been used in the experiment.

In a future experiment using this protocol, researchers should attempt to design a between-subject test and aim for a larger sample. This could reduce the effects of cofounds and enhance

the validity of the findings. Although there are limitations to this study, we were encouraged by the findings and performed two additional studies, this time with significantly larger samples.

5. Study 1 – The relationship between mindfulness meditation and self-control under uncertainty

Study 1 was conducted to replicate the effects of uncertainty on the want/should conflict established by Milkman (2012). We have also included a measure of meditation practice to investigate the differences in how meditators and nonmeditators consume under uncertainty. We suggest that meditators will refrain from consuming indulgent products under uncertainty, following a "should" behavior, whereas nonmeditators will indulge in their "wants".

5.1. Design and method

Three hundred and sixty U.S. Amazon Mechanical Turk respondents (62% female, average age 35.3 years) took part in the study for a monetary reward (US$ 9/hour) and filled out the questionnaire. Crowdsourcing online panels, such as MTurk, provide access to a large number of relatively diverse respondents and have been found to be of equal or higher data quality than street intercepts and student samples (Goodman & Paolacci, 2017). At the end of the questionnaire, we asked the participants about their meditation habits and filtered the sample by frequent meditators (those who meditate three or more times per week) and nonmeditators (those who do not meditate at all). The final sample was composed of 97 frequent meditators (62.88% female, average age 36.11 years) and 202 nonmeditators (64.85% female, average age 35.44 years). Sixty-one participants (those who meditated two or fewer days per week) were excluded from the analysis.

Amazon Mechanical Turk provides researchers with a diverse pool of respondents, and there is evidence that the samples are of equal or higher quality than student or street intercepts (Goodman & Paolacci, 2017). To control for nonnaïvety (Rand, 2018), the most active 5% of respondents in the panel were excluded. To ensure data quality, we included attention filters in the questionnaire. First, the participants were asked to click 5 or more times on a welcome screen before entering the questionnaire. Those who failed to follow the instructions would be redirected to an attention check failure page. This check is meant to exclude bots that automatically fill out questionnaires. Additionally, an intentional manipulation check ('Please select agree as the answer here'; 7-point ordinal scale; Paas et al., 2018) was included in the questionnaire to prevent biased responses (Barber et al., 2013).

The participants received one of three scenarios replicated from Milkman (2012), where there is a manipulation of uncertainty and a subsequent choice between a want and a should consumption option. In the scenario, the participants are told that their flat mate is going to order pizza from their favorite pizzeria for them because they are busy that night. They know that this pizzeria only serves one flavor of pizza each night and that the pizza is always good. They have learned from experience that on Tuesdays (today is a Tuesday), there is a 50% chance that the flavor of the pizza will be Carne Asada and a 50% chance that the pizza will be Chicken Pesto.

There are three conditions in the study: Carne Asada, Chicken Pesto and Uncertainty. In the first two conditions, the participant is informed about the flavor of the pizza (i.e., either Carne Asada or Chicken Pesto) and is asked to choose a dessert to eat after the pizza. The participants are told that they are trying to lose weight and can choose between fruit salad (should option) or a brownie (want option). In the uncertainty condition, the participants are told that they will learn which pizza they will eat when they get home and they are then asked to pick a dessert. As in the other conditions, the participants are told that they are trying to lose weight and can choose either fruit salad (should option) or a brownie (want option). These conditions mimic an ego-depletion scenario, where participants use their cognitive resources to cope with the uncertainty regarding the flavor of pizza they will eat and are subsequently asked to choose between a *want* and *should* option, where self-control is again needed. Following the strength model of self-control, the repetitive demand for cognitive resources generates ego depletion.

We also asked the participants, before they responded to this questionnaire, about how interested they were in following a diet because this could impact their food choice. We asked *Before this survey, I already wanted to lose weight.* They were asked to respond on a 15-point scale from 1 – totally disagree to 15 – totally agree.

5.2. Results and discussion

We analyzed the control variable of whether the participants were on a diet before conducting our study. On a scale from 1 (not on a diet) to 15 (on a diet), the meditators scored an average of 8.58 points, and the nonmeditators scored an average of 8.30 points. We ran a Shapiro–Wilk normality test, and the data were not normal (W = 0.89, p = 3.114e-13). We therefore ran a Wilcox test to compare the means. The p value for the Wilcox test was 0.6411, which means there was no significant difference between the means. This suggests that there was no major difference in the willingness to follow a diet between the groups.

Table 1.

Condition	Meditates	Response			Fisher exact test
Uncertainty		Fresh fruit	Fresh Brownies	Total	
	Yes	38	24	62	0,254
	No	49	46	95	
	Total	87	70	157	
Certainty					
	Yes	82	44	126	0,034*
	No	92	83	175	
	Total	174	127	301	
Aggregated					
	Yes	120	68	188	0,016*
	No	141	129	270	
	Total	161	197	458	

The first step in the analysis was to clean invalid data. In the questionnaire we asked “how many days do you meditate on average in a week?” The participants were expected to include a number between 0 and 7. We deleted three participants from the sample who responded “10”, “60” and “7 hours”. These responses were considered not valid. We also checked the responses for consistency between variables. We deleted cases where, on one variable, participants responded that they do not have a habit of meditating AND, on another variable, that they meditate more than once a week. The same procedure was followed with participants who, on one variable, responded that they have the habit of meditating AND, on another variable, that

they meditate zero times per week. Additionally, 6 participants who indicated that they had previous experience with meditation but who responded that they did not have the habit of meditating were eliminated from the sample. Finally, one participant who was younger than 15 years old and one participant who was older than 60 were eliminated from the sample. After this cleaning procedure, the final sample consisted of 457 participants (61.6% female, μage = 36.17).

The association analysis between meditators and nonmeditators with the dependent variable (fruit salad or brownie) in the sample is significant (Fisher exact test = 0.016). However, when split in the conditions (certainty and uncertainty), the significance is only present in the certainty condition (Fisher exact test = 0.034) and not present in the uncertainty condition (Fisher exact test = 0.254). The Cochran Mantel-Hazel statistic suggests the existence of an odds ratio different from 1 in the sample: the meditator group exhibits a 61% higher chance of choosing fresh fruit salad than a brownie than the nonmeditator group (Mantel-Hazel = CI 95% [1,10; 2,36], p = 0.014). There are no significant differences in the odds ratio between the certainty and uncertainty conditions.

This analysis suggests that those who meditate are more prone to choosing fruit salad than a brownie. Taken together, previous literature, such as the body of research analyzed in our first paper, has already suggested that meditators have higher levels of self-control in different consumption contexts (having higher levels of temperance in food, cigarette, and alcohol consumption or even internet use). However, contrary to our hypothesis, this outcome is not significative in an uncertainty condition. In the following study, we focused on the uncertainty condition and replicated the findings for meditators and nonmeditators in a different and more realistic context.

6. Study 2 - The relationship between mindfulness meditation and self-control under uncertainty in a different context

After having replicated Milkman's effect but with meditators and nonmeditators, we conducted a second experiment that adds external validity to our findings. We focused on the uncertainty condition because that was where the novel findings were. The dependent variable in this study was a choice of lowbrow versus highbrow YouTube videos watched by the participants in their free time. This dependent variable added realism to the study because videos are watched in an online setting, whereas in Study 1, there was a mismatch between the dependent variable (food)

and the setting of the study (online). Furthermore, we also measured ego depletion to establish a mediation in the relationship between meditation practice and virtuous consumption.

In Study 2, the participants had to choose a video to watch under an uncertainty condition. The video was chosen from a total of 10 videos, five of which were classified as lowbrow and five of which were classified as highbrow. This design adapted procedures from Read, Lowenstein and Kalyanaraman (1999), where we asked the participants to rate a set of videos. We chose videos from YouTube, and to ensure that they were perceived as either lowbrow (want option) or highbrow (should option), we performed a pretest.

6.1. Pretest design and method

Thirty participants (53.33% female, average age 35.9 years) were recruited on Amazon Mechanical Turk for a rate of US$ 9/hour. To ensure data quality, the same procedures were performed as in Study 1. The participants were presented with 10 videos in total, with one video shown on each page of the survey. The videos had a duration between 9 and 16 minutes. The videos were divided into Type I (Lowbrow) and Type II (Highbrow) videos, and each of them was followed by a question adapted from Read, Lowenstein and Kalyanaraman (1999). Screenshots of the lowbrow and highbrow videos were shown to the participants, followed by title, duration, and a short synopsis based on the original YouTube texts. Each of the lowbrow videos was followed by the following statement: *This video is fun or pleasurable to watch, but it tends to be quickly forgotten.* Each of the highbrow videos was followed by the following statement: *This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it and think about it afterward.* Both questions were answered on a 7-point scale where 1 = *strongly disagree* and 7 = *strongly agree*.

6.2. Pretest results and discussion

Eight of the 10 videos scored above 5 points *(somewhat agree)* on the question classifying it as either lowbrow or highbrow. Two videos scored below 5 points and were subsequently substituted with videos that were more similar to the ones with a higher score. The video summaries, duration, and pretest scores can be found in the Appendix.

6.3. Study 2 design and method

Having confirmed that the lowbrow and highbrow videos were perceived as such by the participants, we moved on to the main study. Similar procedures for data collection and data quality were used as in Study 1. Six hundred ninety-eight (64.46% female, average age 36.4 years) Amazon Mechanical Turk respondents took part in the study for a monetary reward (US$ 9/hour). At the end of the questionnaire, the participants were asked about their meditation habits, and we compared those who said they had a meditation habit and those who said they did not.

The participants were exposed to an uncertainty priming scenario adapted from Milkman (2012). In the scenario, they were shown a scratch-off lottery ticket with the following text:

Imagine that before starting to work on this HIT, you have received a scratch off lottery ticket as a gift from the researchers. Your ticket looks like the one below:

The researcher then tells you to leave your ticket on the side and to start working on the HIT.

You will be allowed to scratch off your lottery ticket and discover if you have won a prize after you complete the experiment.

Then, the participants were asked to choose a video that they would like to watch in their free time that day from the pretested list of 10 videos. The screenshots of the videos were shown in a mixed order on one page along with their titles, duration, and the same synopsis as the pretest. The participants were instructed to base their choice on the images and synopses and refrain from googling the videos or watching them during the study.

A measure of ego depletion adapted from Milkman (2012) was included in the questionnaire. The participants responded to the questions *I felt too tired to choose the video on the previous question* and *I felt too worn out to choose the video on the previous question* on a 7-point scale where 1 = *strongly disagree* and 7 = *strongly agree*.

Finally, we included the MAAS (Mindful Attention Awareness Scale, Brown and Ryan, 2003) and manipulation checks for the uncertainty condition. The manipulation checks asked three questions on a 7-point scale (1 = strongly disagree, 7 = strongly agree): *I feel uncertain if I will win something with the lottery ticket I received from the researchers, I do not know what will be the result of the scratch off lottery ticket, It is uncertain whether I will win something from the lottery ticket.*

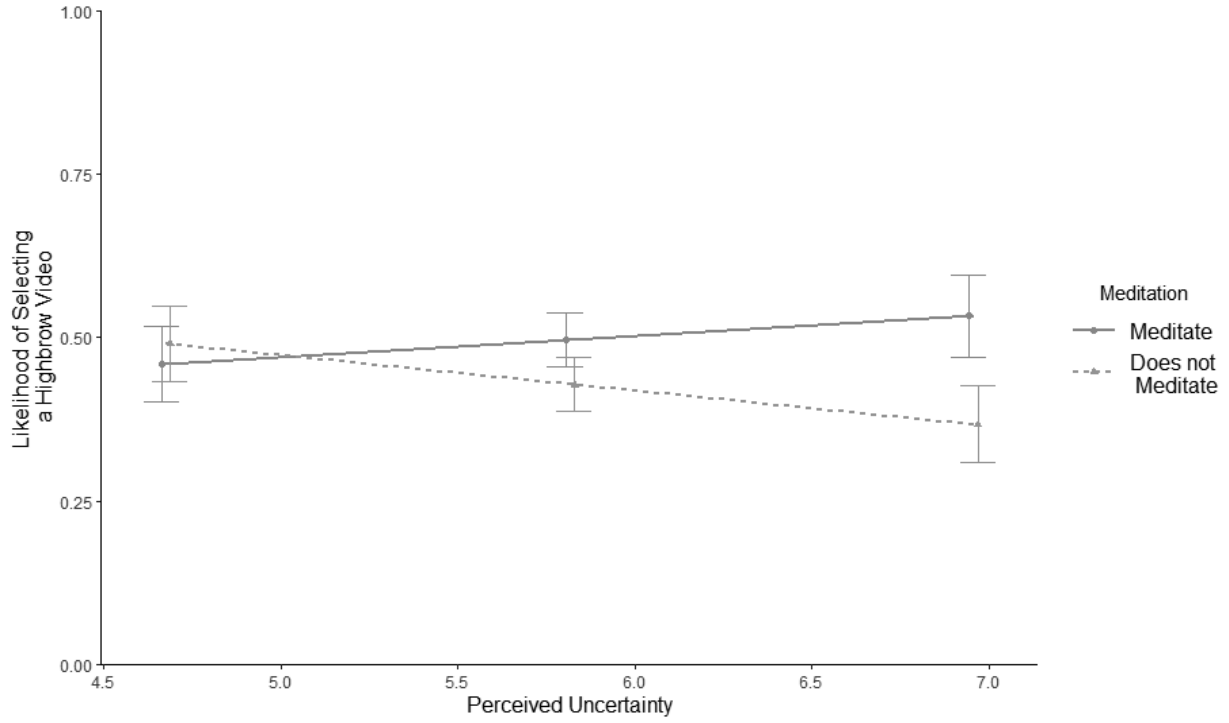
At the end of the questionnaire, the participants were debriefed with the information that the lottery ticket was a part of the study and thanked for their participation.

6.4. Study 2 results and discussion

We cleaned the data and excluded participants who responded inconsistently to the questionnaire and those who did not complete the form. After cleaning the data, our sample consisted of six hundred sixty-nine participants (56.9% female, μage =36.76).

There was no significant difference in the MAAS level between those who meditated and those who did not (ANOVA $F(1,659) = 0.03$, $p = 0.958$). The uncertainty manipulation check, on the other hand, presented a statistically significant difference (ANOVA $F(1,659) = 6.92$, $p = 0.009$). Those who did not meditate perceived the manipulation to have a 0.246-point higher level of uncertainty (CI 95% 0.062; 0.429) than those who meditated.

A moderation analysis was performed with PROCESS v 4.2 for SPSS. This analysis was performed to test the effect of the meditation habit on decision-making when moderated by perceived uncertainty. The logistic regression model was statistically significant X^2 (6, N = 661) = 11.10, p = 0.011. The model explained 2.23% (Nagelkerke R^2). The unconditional interaction test shows that the interaction term was significant X^2 (1, N = 661) = 5.32, p = 0.021. The Johnson-Neyman interval indicated that there was an effect of uncertainty in the relationship between meditators and the dependent variable choice after 5.98 points of the perceived uncertainty score. There was no moderation effect for lower levels of uncertainty scores. There was a negative moderation effect of uncertainty on video choice (b = -0.356, t = -2.29, p = 0.022). In other words, the meditators had a higher probability of choosing highbrow videos with higher levels of uncertainty – see Graph 1. This is in line with our hypothesis H1a.



Graph 1 – Interaction effect

7. General discussion

Crises of uncertainty as well as unpredictable and uncontrollable situations are a part of consumers' lives and create special conditions for decision-making (K. Milkman, 2011). Such conditions are frequent in our daily lives, with examples ranging from the lockdowns during the COVID-19 pandemic to more personal situations, in which we cannot predict future outcomes. Under such situations, consumers tend to indulge in choices that will bring immediate rewards – and higher long-term costs – as opposed to regulating their behavior to choose options with long-term benefits and lower long-term costs. This creates implications for their health but also for the welfare of society. Rises in compulsive consumption under uncertainty crises strain the health care system and the environment, and it is important to find ways of counteracting such effects.

We introduced the frequent practice of mindfulness meditation as a condition that can flip this behavior. In one of our studies, we found that those who practice meditation frequently and over longer periods are more likely to choose *should* options over *want* options under uncertainty,

whereas those who do not practice meditation are more prone to choosing indulgence under uncertainty (Study 2). We tested this effect and its mechanism, namely, ego depletion, in a pilot study. Furthermore, we tested the relationship of the *want/should* option with meditation practice under different decision-making contexts with meditators choosing the *should* option under uncertainty for in entertainment choices (Study 2), but not in food choices (Study 1). There are, however, contradictions in our findings. In Study 1, mindfulness was found to affect consumption only under certainty, but in Study 2, there was an interaction between uncertainty and mindfulness habits at high levels of uncertainty. Therefore, more research needs to be done to establish under which conditions mindfulness increases self-control under uncertainty.

Policy-makers, meditation teachers and other professionals interested in regulating consumption in crisis situations can use these findings to inform the implementation of mindfulness meditation programs for consumers. Although our findings are not yet conclusive, they point to the potential of mindfulness to alleviate malefic consumption under uncertainty. This can inspire researchers and policy-makers to investigate how mindfulness can help consumers under uncertainty.

8. Limitations and future research directions

The present paper finds initial evidence that mindfulness meditation counteracts indulgent consumption under high levels of uncertainty in one of our studies (Study 2). Even though these are interesting findings, we still have not established a causal link between meditation and *should* options in food and entertainment. Future research should aim to overcome this shortcoming. Furthermore, our theoretical frame could be broadened. We currently use ego-depletion theory; however, we are aware of this theory's controversial status as well as alternative explanations such as those posed by Inzlicht et al. (2014).

Another limitation of this paper is the study design of our pilot study. We could have confirmed our hypothesis with a larger sample and a between-subjects design. Future research should aim to overcome these limitations as well as find other boundary conditions that can boost consumer self-control in uncertainty situations.

9. Theoretical and managerial contributions

It is known that mindfulness and meditation are associated with higher self-control in consumption (Tang, Posner, et al., 2015). It is also known that uncertainty leads to lower self-control in consumer behavior (K. Milkman, 2011). This paper introduces initial evidence that meditation as a practice that can boost self-control in uncertainty conditions. We therefore merge these two streams of research, contributing to both the *want/should* literature and the mindfulness meditation literature. We provide correlational evidence that meditation is related to consumer behavior that prioritizes long- over short-term gains under uncertainty. Furthermore, we provide causal evidence that practicing mindfulness influences self-control and ego depletion under uncertainty.

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Appendix 1. Study 2 Pretest video score averages

Video	Type I Video	Type I Video	Type I Video	Type I Video	Type I Video
	Title: Adorable TikTok Pets that Will Make Your Day Better 100%	Title: Dua Lipa | Tiny Desk (Home) Concert	Title: Top 10 Country Songs of All Time	Title: BEST MEMES COMPILATION! Try Not to Laugh Challenge | Dank Memes	Title: BEST CAT MEMES | FUNNY CAT VIDEOS
	Duration: 16 min	Duration: 15 min	Duration: 12 min	Duration: 11 min	Duration: 9 min
	Synopsis: A compilation of the cutest pets on TikTok. This is guaranteed to make your day better! -	Synopsis: While we can't film our Tiny Desk concerts at NPR's D.C. office during the pandemic, our "home" series has created opportunity for global megastars like Dua Lipa to bring her uptempo dance joints all the way from London. -	Synopsis: Throw on your jeans, shine up your boots, and grab yourself a cold one. Join WatchMojo.com as we count down our picks for the top 10 country songs of all time. -	Synopsis: Start off your day with a brand new video of the funniest viral videos from around the internet! -	Synopsis: Watch this funny cat video and enjoy all best cat memes. -
Question	This video is	This video is	This video is fun	This video is fun	This video is fun

	fun or pleasurable to watch, but it tends to be quickly forgotten.	fun or pleasurable to watch, but it tends to be quickly forgotten.	or pleasurable to watch, but it tends to be quickly forgotten.	or pleasurable to watch, but it tends to be quickly forgotten.	or pleasurable to watch, but it tends to be quickly forgotten.
Average on a scale 1 totally disagree - 7 totally agree	5.761904762	4.619047619	4.476190476	5.428571429	5.380952381
Video	Type II Video	Type II Video	Type II Video	Type II Video	Type II Video
	Title: The Nature of Nature	Title: Cooking Basics With Gordon Ramsay | Part One	Title: How to Grill Burgers (That are Big on Flavor, Not in Volume) | Kenji's Cooking Show	Title: How to learn to code (quickly and easily!)	Title: How to Get Your Brain to Focus | Chris Bailey | TEDxManchester
	Duration: 14 min	Duration: 10 min	Duration: 11 min	Duration: 11 min	Duration: 15 min
	Synopsis: National Geographic Explorer in Residence Enric Sala shares the story of his scientific awakening and his transition from academia to activism. His life's work of protecting the ocean tells a compelling story. -	Synopsis: Here are some basic skills that everyone should know! Learn techniques that will help you in the kitchen, from using knives to cutting onions. -	Synopsis: This video is based on my New York Times recipe about how to cook thinner burgers with big, juicy, grilled flavor. -	Synopsis: Ex-Google tech lead Patrick Shyu explains how to learn to code quickly and easily, with this one weird trick! It's so simple with this 1-step program! -	Synopsis: The latest research is clear: the state of our attention determines the state of our lives. So how do we harness our attention to focus deeper, get distracted less, and even become more creative? -
Question	This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it	This video tends to be less pleasurable to watch than Type I videos, but you are	This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it and think about	This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it and think about it	This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it and think about it

	and think about it afterward.	more likely to remember it and think about it afterward.	it afterward.	afterward.	afterward.
Average on a scale 1 totally disagree - 7 totally agree	5.380952381	5.238095238	5.095238095	5.19047619	5.333333333

Appendix 2. Study 2 Pretest video score averages

Video	Type I Video	Type I Video	Type I Video	Type I Video	Type I Video
	Title: Adorable TikTok Pets that Will Make Your Day Better 100%	Title: Dua Lipa | Tiny Desk (Home) Concert	Title: Top 10 Country Songs of All Time	Title: BEST MEMES COMPILATION! Try Not to Laugh Challenge | Dank Memes	Title: BEST CAT MEMES | FUNNY CAT VIDEOS
	Duration: 16 min	Duration: 15 min	Duration: 12 min	Duration: 11 min	Duration: 9 min
	Synopsis: A compilation of the cutest pets on TikTok. This is guaranteed to make your day better! -	Synopsis: While we cannot film our Tiny Desk concerts at NPR's D.C. office during the pandemic, our "home" series has created opportunity for global megastars like Dua Lipa to bring her uptempo dance joints all the way from London. -	Synopsis: Throw on your jeans, shine up your boots, and grab yourself a cold one. Join WatchMojo.com as we count down our picks for the top 10 country songs of all time. -	Synopsis: Start off your day with a brand new video of the funniest viral videos from around the internet! -	Synopsis: Watch this funny cat video and enjoy all best cat memes. -
Question	This video is fun or	This video is fun or	This video is fun or pleasurable to	This video is fun or pleasurable to	This video is fun or pleasurable to

	pleasurable to watch, but it tends to be quickly forgotten.	pleasurable to watch, but it tends to be quickly forgotten.	watch, but it tends to be quickly forgotten.	watch, but it tends to be quickly forgotten.	watch, but it tends to be quickly forgotten.
Average on a scale 1 totally disagree - 7 totally agree	5.761904762	4.619047619	4.476190476	5.428571429	5.380952381
Video	Type II Video Title: The Nature of Nature	Type II Video Title: Cooking Basics With Gordon Ramsay | Part One	Type II Video Title: How to Grill Burgers (That are Big on Flavor, Not in Volume) | Kenji's Cooking Show	Type II Video Title: How to learn to code (quickly and easily!)	Type II Video Title: How to Get Your Brain to Focus | Chris Bailey | TEDxManchester
	Duration: 14 min	Duration: 10 min	Duration: 11 min	Duration: 11 min	Duration: 15 min
	Synopsis: National Geographic Explorer in Residence Enric Sala shares the story of his scientific awakening and his transition from academia to activism. His life's work of protecting the ocean tells a compelling story. -	Synopsis: Here are some basic skills that everyone should know! Learn techniques that will help you in the kitchen, from using knives to cutting onions. -	Synopsis: This video is based on my New York Times recipe about how to cook thinner burgers with big, juicy, grilled flavor. -	Synopsis: Ex-Google tech lead Patrick Shyu explains how to learn to code quickly and easily, with this one weird trick! It is so simple with this 1-step program! -	Synopsis: The latest research is clear: the state of our attention determines the state of our lives. So how do we harness our attention to focus deeper, get distracted less, and even become more creative? -
Question	This video tends to be less pleasurable to watch than Type I videos, but	This video tends to be less pleasurable to watch than Type I videos, but	This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it and	This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it and think about	This video tends to be less pleasurable to watch than Type I videos, but you are more likely to remember it and

	you are more likely to remember it and think about it afterward.	you are more likely to remember it and think about it afterward.	think about it afterward.	it afterward.	think about it afterward.
Average on a scale 1 totally disagree - 7 totally agree	5.380952381	5.238095238	5.095238095	5.19047619	5.333333333

MAAS Scale

Below is a collection of statements about your everyday experience. Using the 1–7 scale below, please indicate how frequently or infrequently you currently have each experience (1 = neverl 7 = always). Please answer according to what *truly reflects* your experience rather than what you think your experience should be.

1. I could experience an emotion and not be conscious of it until some time later.
2. I break or spill things because of carelessness, inattention, or distractedness.
3. I find it difficult to stay focused on what is happening in the present.
4. I tend to walk quickly to get where I am going without paying attention to what I experience along the way.
5. I tend not to notice feelings of physical tension or discomfort until they truly grab my attention.
6. I forget a person's name almost as soon as I have heard it for the first time.
7. It seems I am "running on automatic" without much awareness of what I am doing.
8. I rush through activities without being truly attentive to them.
9. I get so focused on the goal I want to achieve that I lose touch with what I am doing in the present to get there.
10. I do jobs or tasks automatically, without being aware of what I am doing.
11. I find myself listening to someone with one ear while doing something else at the same time.
12. I drive places on "automatic pilot" and then wonder why I went there.
13. I find myself preoccupied with the future or the past.
14. I find myself doing things without paying attention.
15. I snack without being aware that I am eating

Article 3

Mindfulness, Neuroplasticity, and Volition:

The Effects of Mindfulness Meditation on the Anti-Saccade Task

Letícia Vedolin Sebastião

Abstract:

There is a lack of neuroscientific research in the literature on mindfulness and consumption. Specifically, there is little neuroscientific evidence of the effects of mindfulness meditation on consumer self-control. To address this shortcoming, we propose a test of the effects of meditative mindfulness on the anti-saccade task, an eye tracking protocol that measures self-control. A sample of 28 participants performed the task before and after a period of two weeks of daily meditation practice. I found a trend toward lower performance on the task after meditation, which suggests that mindfulness can deplete subconscious resources in self-control.

Keywords:

Mindfulness, anti-saccade task, eye tracking, self-control, neuroplasticity

1. Introduction

Society is currently facing a variety of challenges that can be traced back to consumer self-control. Consumers overindulge in food, cigarettes and alcohol or overconsume clothes and plastic, leading to negative health and environmental outcomes. In an attempt to solve these problems, researchers have used mindfulness interventions to increase consumers' self-control. Recent findings indicate that meditative mindfulness interventions can increase self-control in the consumption of cigarettes (Tang, 2017), alcohol (Carpentier et al., 2015), and food (Tapper & Seguias, 2020) and habits such as gambling (de Lisle et al., 2011) and smartphone use (Zhang et al., 2020).

These effects are attributed to the phenomenon of neuroplasticity, which describes the brain's capacity to change pathways and neural structure as a result of external stimuli (Treadway & Lazar, 2010). It is argued that meditative mindfulness affects the areas in the brain that are responsible for the self-regulation of consumption such as the amygdala and the prefrontal cortex (Tang, 2017), which leads to higher self-control. Due to the complexity involved in conducting neuroscientific research and especially in measuring long-term effects, most of the articles in the field of mindfulness and consumption fail to provide neuroscientific evidence of such changes. Longitudinal studies within this field are few. It remains unclear whether the neurological differences that have been found are due to mindfulness practices or whether they are innate. There is also an outstanding question of whether people practice mindfulness as a result of such innate neurological differences (Wheeler, Arnkoff, and Glass, 2017).

To address this shortcoming in the literature, this paper utilizes a biometric research design to test the effects of meditative mindfulness on the anti-saccade task. The anti-saccade task is an eye tracking protocol that is associated with the activity of the dorsolateral prefrontal cortex (DLPFC), among other areas of the brain (Hutton and Ettinger, 2006). The DLPFC is the area of the brain responsible for decision-making, judgment and self-control (Oldrati et al., 2016), and it has been found to be affected by mindfulness meditation (Taren et al., 2017). The DLPFC has also been associated with lower levels of compulsive consumption (Dias et al., 2015; Iacono et al., 2000). We therefore propose that the effect of mindfulness meditation on brain regions related to self-control can be measured by the anti-saccade task, providing a novel way of assessing the effects of meditative mindfulness.

To test this hypothesis, we studied the impact of two weeks of a 15-minute daily practice of mindfulness meditation on anti-saccade task performance. The anti-saccade task is mainly used as a correlate of neuropsychiatric disorders where frontal lobe dysfunction is present, such as schizophrenia (Hutton & Ettinger, 2006). The present study proposes a novel approach in which we test a nonclinical population and their performance on the task. The idea that the task can be affected by meditation habits is also novel. We found a trend toward worsening performance in the anti-saccade task after two weeks of daily meditation practice. These are preliminary findings and suggest that the anti-saccade task is sensitive to meditation practice.

The findings have implications for researchers and policy-makers. Researchers in neuroplasticity have learned that there might be changes in the DLPFC after meditation that result in alterations in the anti-saccade task. Future research should aim to establish a significant outcome through a test with a larger sample or different practice doses. Practitioners and policy-makers aiming to affect self-control through mindfulness interventions can use this study to learn how these changes occur in the brain.

This paper is relevant for marketing scholars and practitioners because it tests the assumptions that mindfulness practice can affect volition and self-control. Previous research has pointed toward the benefits of mindfulness for consumers, claiming that mindfulness can alleviate personal, societal, and environmental issues related to overconsumption (Bahl et a., 2016). Additionally, we found in our literature review that mindfulness is associated with different types of temperate consumption, such as temperance in the consumption of alcohol, cigarettes, and food. More can be understood, however, about how mindfulness leads to temperate consumption. We offer a pilot study showing how to test mindfulness and self-control or volition through a neurobiological measure associated with consumption, namely, the anti-saccade task. Few studies have linked mindfulness and eye tracking techniques, even though this approach can potentially offer new insights into the field. Eye tracking is a neurobiological research tool that demands fewer resources for consumer researchers than other techniques, and it is therefore a good option for marketing scholars who want to contribute to marketing science at the intersection of biology and consumer psychology.

2. The anti-saccade task and inhibitory control

The anti-saccade task is a widely tested measure of inhibitory control (Mirsky et al., 2011). Inhibitory control is an executive function that consists of inhibitory control of attention, cognitive inhibition and self-control (Diamond, 2013). Inhibitory control is also considered a facet of self-control that can be measured by inhibition tasks (Wennerhold and Friese, 2020). Inhibitory control involves effortful top-down mental processes used when a person must concentrate or attend to a specific task (Diamond, 2013). Employing inhibitory control requires more brain activity than "going on autopilot" and acting automatically. The consequence of such control is, e.g., that a person will be able to resist temptation and change behavior (Diamond, 2013). Inhibitory control is a function that allows people to suppress mindless reactions to stimuli that might be of less relevance for a certain task. It allows us to choose our actions mindfully and keeps us from being impulsive or having difficulty controlling that function. Thus, the anti-saccade task has been used by neurologists, psychologists and psychiatrists as a research tool, and the performance of participants can be related to a series of mental conditions, e.g., affective disorder, attention deficit hyperactivity disorder, obsessive compulsive disorder, and schizophrenia (Hutton and Ettinger, 2006).

In an anti-saccade task, participants are instructed to exert inhibitory control by actively resisting the instinct of attending to a salient stimulus. In the center of a computer screen, a small circle is displayed, at which participants are instructed to gaze. The circle will then move randomly either to the right or to the left. The task is split into prosaccade and anti-saccade trials. In the former, participants are instructed to gaze at the circles when they move, whereas in the latter, they are instructed to gaze in the opposite direction of the circle, thus resisting the automatic temptation to attend to the stimuli.

Tests where individuals let their eyes move toward a salient stimulus (prosaccade) or away from it (anti-saccade) have been the topic of many neuroscience studies using fMRI (Meeter et al., 2010; Mirsky et al., 2011). Different areas of the brain are activated in the task of moving the eyes, such as the frontal eye fields, supplementary eye fields, dorsolateral prefrontal cortex, anterior cingulate, posterior parietal cortex, thalamus and striatum (Hutton and Ettinger, 2006). The DLPFC is of particular interest to this study as this area of the brain has been found to have a role in the voluntary control of eye movements (Pierrot-Deseilligny et al. 2005), is involved in inhibitory control (Oldrati et al., 2016), and is correlated with compulsive consumption (Amiaz

et al., 2009). Furthermore, the DLPFC has been found to be affected by mindfulness meditation (Taren et al., 2017).

3. Mindfulness and inhibitory control

Mindfulness has its roots in Buddhist psychology and is a translation of the Pali word sati, which has been translated as attention, awareness, retention and discernment (Davidson & Kaszniak, 2015). There are two areas of study in the mindfulness research (Hart et al., 2013): creative mindfulness and meditative mindfulness. Creative mindfulness is based on the work of Ellen Langer and associates mindfulness with openness to experiences and creativity. In this line of thought, mindfulness is reached through the act of paying attention to external stimuli without the use of meditation. The second line of research is meditative mindfulness, which bridges wisdom from Buddhist psychology and meditative practices with Western science. In meditative mindfulness, participants are taught both formal and informal mindfulness practices as well as yoga and psychoeducation about stress. Meditative mindfulness is said to be broader in scope and to encompass creative mindfulness (Hart et al., 2013). Meditative mindfulness has been argued to have a neuroplasticity effect, and in the following sections, we will refer to meditative mindfulness.

Kabat-Zin, the researcher behind meditative mindfulness and the one responsible for developing the first secular mindfulness training program – mindfulness-based stress reduction (MBSR), defines mindfulness as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (2003, p.145). A typical meditative mindfulness practice involves focusing one's attention upon an object, e.g., one's breath, sounds, thoughts or emotions, and monitoring the mind to detect when it has wandered (Davidson & Kaszniak, 2015). The function of this monitoring process is to repeatedly bring awareness back to an object or given task. Mindfulness practitioners engage in this process with an attitude of kindness and compassion, staying with the experience moment-by-moment without judging its content (Shapiro et al., 2006).

Different studies have found support for the positive effects of mindfulness practices on executive functions. Tests have been performed with a variety of cognitive tasks, such as the Stroop task, the attention network test, the internal switching task and the continuous performance test (Teper and Inzlicht, 2013). The mindfulness treatment used in these tests

varies from a 20-minute attention meditation practice (Wenk-Sormaz, 2005) to a 10-day intensive meditation retreat (Chambers et al., 2008). Teper and Inzlicht (2013) also established that enhanced performance on the Stroop test correlated with meditation experience. Different mindfulness interventions have been argued to have a connection with the DLPFC and with other parts of the brain (Kral et al., 2019; Taren et al., 2017).

4. How mindfulness affects the brain

The research on mindfulness and neuroscience and biopsychological measures demands many resources such as expensive equipment, highly specialized researchers and the time and involvement of participants. These factors hinder the popularization of this type of research, especially in business schools and consumer psychology departments where there are different methodological traditions.

Notwithstanding these barriers, researchers already have some understanding of how mindfulness affects the brain. Fox et al. (2014) identified two types of changes that can be measured in the brain, specifically, structural and functional changes. Structural changes can be measured by morphometric tools, which assess changes in anatomy based on characteristics such as the shape, size, or organization of gray and white matter. Functional changes, on the other hand, assess brain activity through the observation of blood flow and electrical potentials. There is an assumption in the field that structural changes will eventually lead to functional changes.

The current study conducted a meta-analysis of morphometric changes as an outcome of mindfulness and found structural differences between meditators and controls in 9 regions of the brain for long-term practice and 7 regions of the brain for short-term practice. The brain regions affected by mindfulness are responsible for processes such as self-control, emotional regulation, enteroception, meta-awareness, attention regulation and body awareness. There is, however, a question of whether changes in these regions were caused by practice or if they were already different in the participants who chose to become mindfulness practitioners.

The significance of the changes is therefore still controversial. The sample size of the abovementioned meta-analysis is still small, and other studies have found little evidence of brain change in mindfulness practice. One example is a very recent randomized control trial (RCT) testing mindfulness-based stress reduction and its effects on the brain (Kral et al., 2022). In this

study, researchers compared three groups of more than 70 participants each: MBSR, wait-list and a well-being intervention as active control. They found no significant differences in brain structure after the interventions. According to the authors of the paper, this is the most rigorous test assessing brain change after the MBSR intervention. Here, problems of randomization and small sample sizes have been addressed so that real causation can be tested. The authors state that longer periods of practice may be needed to exert a change in brain structure. Additionally, this study filtered out unhealthy participants, which may have affected the results. According to the authors, it may be that the effects are more significant for those already experiencing anxiety or depression.

The field of mindfulness and neuroscience is therefore very complex, with contradictory findings and new research pointing toward different outcomes every day. More research is needed to identify the effects and test the efficacy of mindfulness interventions. There is still controversy around how much practice is needed for any changes to happen, with some studies pointing to as little as 5 h and others stating that only long-term practice is effective. The present study is one contribution in this vast field of research, in which we aim to test the effectiveness of a short intervention in affecting a measure of self-control and volition. We do so using eye tracking technology. Below, we review some of the findings within the mindfulness and eye tracking research before moving on to describe our theoretical background and study.

5. Mindfulness and eye tracking

There is a paucity of research using eye tracking methodologies to assess the effects of mindfulness on consumers or individuals in general. One of the first examples of such research was published in 2018 and investigates the moderating role of attentional bias in the relationship between mindfulness and pain. The authors found, through an eye tracking study, that those who had difficulty disengaging from pain words benefited less from the mindfulness intervention (Shires et al., 2018). More recently, the author of the present paper and her masters thesis supervisor published a conference paper at the European Marketing Academy. The thesis measured pupillometry data with an eye tracker after a short mindfulness induction and a control induction (Vedolin Sebastião and Pizzutti, 2020). Based on eye tracking data, the authors found that consumers' attention to a fake news piece was affected by a mindfulness practice.

Authors have also measured the correlations of trait mindfulness and different eye tracking outcomes. The research within this area has obtained contradictory results, with some authors finding that trait mindfulness is associated with reduced attentional bias to negative valenced images (Kraines et al., 2021) and others finding an association with both happy and threatening images (Ford et al., 2021). Additionally, research has been performed to measure eye tracking outcomes after long mindfulness interventions. Holas et al. (2020) found that attentional bias toward sad faces decreased, whereas attention to happy faces increased after MBCT (mindfulness-based cognitive therapy).

Eye tracking techniques have the potential to assess the biopsychological and attentional mechanisms involved in trait mindfulness and mindfulness practice. The field is still in its infancy, and more research is needed to explain the contradictory findings as well as expand the number of participants in some studies. The present paper introduces the anti-saccade task, a protocol that has not yet been used in connection with mindfulness and meditation and is an attempt to help develop the body of research on mindfulness and biopsychological measures.

6. Neuroplasticity

The theorizing around neuroplasticity in relation to mindfulness considers how the brain can be altered as a consequence of mindfulness practice. For most of the twentieth century, the dominant belief was that the adult brain did not go through any changes. Researchers in the field believed that the brain had a fixed number of neurons with associated connections, and neither neurons nor connections could be renewed or replaced after the cells died (Fuchs & Flügge, 2014). With the innovation of neuroimaging methods in the 1960s, scientists began to observe that the adult brain continues to show alterations. These observations were in line with late nineteenth century descriptions of nonpathological alterations in the adult brain (Fuchs & Flügge, 2014).

Neuroplasticity posits that animals' – from the simplest structures up to human beings – neural structures and functions are plastic and can change. Neuronal plasticity can refer to changes in the morphology, connectivity, or biochemical structures of neurons (Fuchs & Flügge, 2014). It can also refer to the generation of new neurons (neurogenesis) (Fuchs & Flügge, 2014). These changes in the brain take place as a result of either internal or external impacts, which include

long-lasting experiences, deliberate neural activity, hormones, stress and drugs (Shaw and McEachern, 2000). Such impacts can be either acute, as in the case of a traumatic experience, or chronic, as in the case of a highly stressful lifestyle.

Neuronal changes take place at different levels, where the most basic changes are the result of genetic events, and the most complex are the result of behavior. Between these extremes, molecules, synapses, cells, circuits, the entire central nervous system and the whole body can be affected by neuroplasticity. Because these different levels are nested, a change in each one of them will directly and indirectly affect the others, as either a top-down or bottom-up process. The modification or stability in neural activity therefore occurs through the interactions and relationships of different levels of organization. If an external stimulus or behavior is relevant or strong enough for the organism, it will impact all the other levels, leading to genomic change. The same goes for genetic instructions, which will lead to alterations in behavior. Figure 1 depicts the different levels (it was created by the author based on text from Shaw and McEachern (2000)).

A feedback system between levels will reinforce changes, which can lead to either pathology or learning, depending on the adaptability of the alterations. Early in life, genetic information will have a greater impact on the other levels. This will change throughout life. In the critical period, genetic information will be combined with environmental factors. After that – which tends to be after puberty – environmental influences became the greater source of neuronal change (Fuchs & Flügge, 2014). Stability is a characteristic of adult systems; however, change still occurs under specific circumstances.

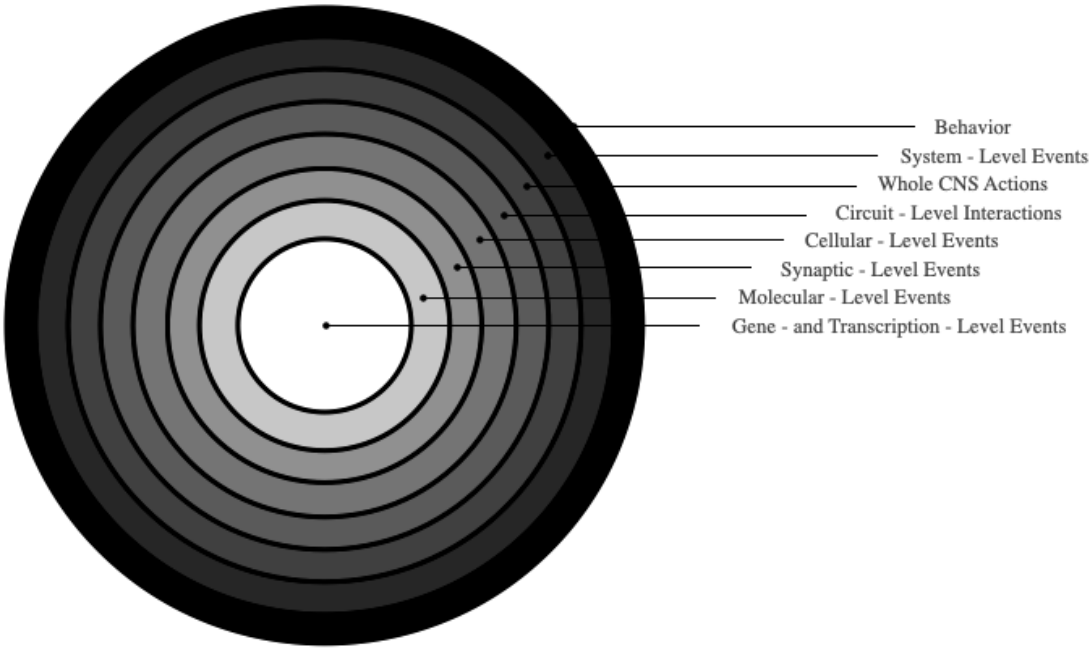


Figure 1 – Different levels of neuronal changes – based on Shaw and McEachern (2000) and designed by the author

7. Hypothesis development

As shown above, there is still controversy concerning whether mindfulness leads to changes in the brain regions associated with volition. Previous research (as shown in the first paper of this thesis) has found that mindfulness is associated with and causes changes in consumer behavior and self-control. Different mindfulness interventions lead to temperance in the consumption of food, alcohol, and other substances. It remains a question whether such changes in consumer behavior are associated with any changes in the brain, and the present paper is a first attempt to test this proposition.

We therefore expect that mindfulness will influence performance on the anti-saccade task, which is a task used to measure volition. The following hypothesis is therefore proposed:

H1: A two-week daily mindfulness practice intervention will lead to a decrease in the error rate on the anti-saccade task

To test this hypothesis, we perform the experiment described below.

8. Method and procedures

The neuroplasticity theory explains how a stimulus such as mindfulness meditation can have an effect on the brain structure and lead to an alteration in a behavioral pattern. There is evidence that meditation causes changes in the brain and that such changes are associated with cognitive and emotional benefits (Treadway and Lazar, 2010). Significant changes in cognitive tasks such as the Stroop task can occur in an 8-day practice period, even with those not experienced in meditation (Kozasa, Radvany, Barreiros, Leite, & Amaro, 2008). This shows that even novice meditators can experience neuroplasticity as a result of mindfulness practice over a short period of time.

Following these findings, we tested the effect of a two-week daily meditative mindfulness practice. We proposed to our participants that they should incorporate the practice in their daily lives, asking them to dedicate 15 minutes to practice as a routine each day. This was an attempt to design an intervention that could easily become a part of the participants' daily schedule without asking them to incorporate major changes into their routines.

To test the impact of these two weeks of mindfulness meditation practice on neuroplasticity, we performed a within-subject design experiment. We chose the within-subject design to test the individual changes from a first test to a second test (T1 and T2) and to avoid effects due to differences within the test group. Twenty-eight participants were recruited via ads on social media and at the university, and 3 participants dropped out between T1 and T2, resulting in a final sample of 25 participants (95.8% female, 26.12 average age). The experiment was conducted at the university's lab using a Tobii Pro Fusion 120 Hz eye-tracker connected to a 17-inch high-performance laptop.

The sample for this test is the same used in the pretest in the second article of this thesis. Both studies took place in the same lab; however, there was an interval between the data collection of the variables in each paper. After collecting the anti-saccade data, the participants were offered a break to rest and were told by the researcher that data collection for a second study would begin.

At the end of the studies, the participants were debriefed by the researcher and offered compensation.

The participants were welcomed into the lab in T1 and instructed about the anti-saccade task. The anti-saccade task follows the protocol proposed by Antoniades et al. (2013), which consists of both prosaccade and anti-saccade trials. This protocol instructs participants to first follow the target stimulus on a computer screen 60 times (prosaccade). The first trial was followed by three trials in which the participants were asked to look in the opposite direction of the target 45 times each (anti-saccade). Finally, the participants repeated the prosaccade task. Target stimuli were presented at an amplitude of 8-10 deg of the center of the screen, distributed equally and randomly either to the right or left. The targets were set at 50% contrast to the background – being dark on a light screen – and were 5 deg in diameter. The fore period – the time before the target appears on the screen – was between 1 and 3.5 s, with different random durations in each trial. The target stimulus remained on the screen for 1 second.

After T1, the participants were instructed to practice a mindfulness meditation by listening to a 15-minute recording previously used by Hafenbrack et al. (2014). The audio was recorded by an experienced meditation teacher and instructs participants to pay attention to their bodies and breath. The participants were asked to listen to the recording once a day for two weeks. They were then invited back into the lab (T2) to go through the same anti-saccade task. The testing for T2 was scheduled on a similar day of the week and at a similar time of day as in T1. Before starting the task in T2, the participants were instructed to listen to a 7-minute version of the same meditation recording to induce mindfulness. After the task, the participants were thanked and given a reward, which was a 100 DKK gift card.

Performance on the anti-saccade task was measured by the participants' failure to look in the opposite direction from the salient circle, considering only the three anti-saccade trials. The screen was divided into three areas of interest (AOI) following the procedures from (Unsworth et al., 2004): the area of the screen to which the dot moves, the center of the screen, and the area of the screen opposite where the dot moves. Depending on the trial – either anti-saccade or prosaccade – we identified the AOIs as a 'wrong AOI' or a 'correct AOI'. Gazing at the 'wrong AOI' meant that the participant failed the task, whereas gazing at the 'correct AOI' meant that the participant succeeded in the task. We counted how many times the participants failed in the

task using the dwell count measure extracted from the iMotions software version 9.1 used for the test setup. That was our dependent measure.

9. Results

To test whether the manipulation of mindfulness had an effect on participants, levels of mindfulness were assessed before and after the intervention. The MAAS scale (Ryan and Brown, 2003) was used, where a higher number reflects higher levels of mindlessness. Measurements were performed before (μ=3.28, σ = 0.744) and after (μ=3.31, σ = 0.887) the meditation period, and we found that, contrary to expectations, mindfulness was reduced after the intervention (df = 25, t < 0.001). This may have happened because the intervention was too short to generate an alteration in the scale and because the participants had little meditation experience, which can generate higher levels of effort in the practice (Creswell, 2017), possibly reducing its effects.

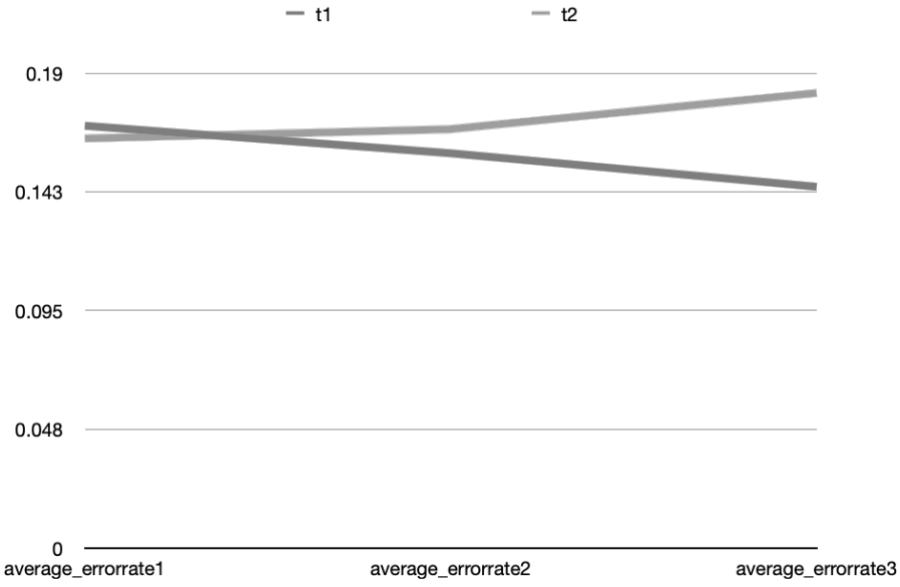
The average dwell count on the wrong AOIs was 21.32 times (sd = 15.8) in the first session (T1) and 23.24 (sd = 25.32) in the second session (T2). We tested the data for normality with a Shapiro test, and the data did not follow a normal distribution ($p < 0.05$ for both T1 and T2). We therefore compared T1 and T2 with a paired Wilcox test, a nonparametric test. There was no significant difference between the dwell count at T1 and T2 (V = 141, p = 0.289).

We also tested the error rate between wrong and correct AOIs. We calculated the error rate splitting the dwell count on the wrong AOIs by dwell count on the correct AOIs. The average dwell count error rate was 15.72% (sd = 11.5%) in the first session (T1) and 17.09% (sd = 18.4%) in the second session (T2). We tested the data for normality with a Shapiro test, and the data did not follow a normal distribution ($p < 0.05$ for both T1 and T2). We therefore compared T1 and T2 with a paired Wilcox test, a nonparametric test. There was no significant difference between the dwell count error rates at T1 and T2 (V = 165, p = 0.531).

We then ordered the error rates in the order in which the test was taken. There were three different anti-saccade trials in each session. We tested the difference between T1 and T2 in these different trials (Table 1, Figure 1). There was also no significant difference between T1 and T2 in the first two trials, but there was a trend (marginally significant difference) in error rates in trial 3.

Table 1.

	t1	t2		p
DwellCount_average_errorrate1	0.169014672008461	0.163918182752595	Not significantly different	0.39
DwellCount_average_errorrate2	0.157981043619093	0.167652511099579	Not significantly different	0.97
DwellCount_average_errorrate3	0.144569289478482	0.182136100570355	Marginally significant difference	0.10



We then performed the same analysis with the error count. We tested the difference between T1 and T2 in these different trials (Table 2, Figure 2). Again, there was no significant difference between T1 and T2 in the different trials.

Table 2.

	t1	t2		P
average_error1	7.64	7.44	Not significantly different	0.48
average_error2	7.16	7.64	Not significantly different	0.91

average_error3	6.52	8.16	Not significantly different	0.12

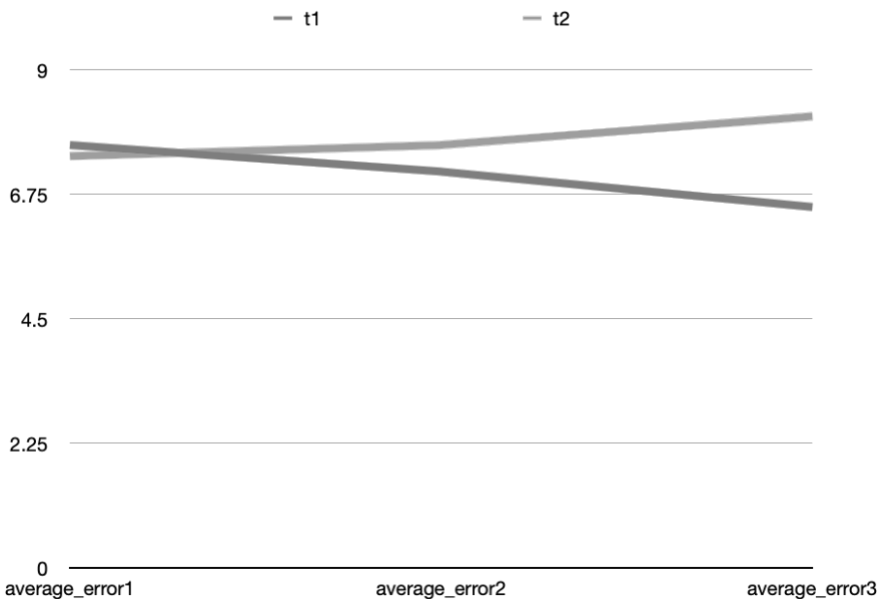


Figure 2

10. Discussion, limitations, and implications

The results show that we failed to confirm the correlation between mindfulness meditation practice and its impact on neuroplasticity for most of the analyzed trials. This suggests that a period of two weeks of daily mindfulness meditation practice has no effect on performance in the anti-saccade task. This result may have been obtained for different reasons. It is possible that a two-week period of practice has no effect on the activity in DLPFC and thus have no effect on self-control and volition as measured by the anti-saccade task. It is also possible that this specific mindfulness practice has no effect but other types of meditation would. Furthermore, there is the possibility that the participants were not able to engage in the practice in a way that yields any changes in self-control. This may have happened because they were novice meditators or because they failed to practice frequently enough.

We did, however, find a trend toward an increase in the error rate from T1 to T2 in the third anti-saccade trial. This suggests that after meditation practice, the participants had marginally

significantly worse performance on the task. This could mean that the participants were more tired in performing the task after meditation practice, suggesting that meditation was resource depleting. This suggests that meditative mindfulness can lead to changes in anti-saccade performance, which is in line with the previous literature stating that mindfulness is an effortful practice (Creswell, 2017). This is especially true for novice practitioners, which is the case in our sample, as 55% of our participants had no meditation experience prior to the test, and 27.5% had less than one year of meditation experience prior to the test.

There are, however, alternative explanations for the difference in performance on the third trial of the study. At T1, the participants became slightly better at the task in the third trial, which may be due to experience and learning. At T2, however, the participants made more mistakes in the third trial. This may have happened because the participants became bored with the task, which led to more mistakes. Familiarity and boredom are side effects of within-subjects designs and can hinder the validity of findings.

Alternatively, it could be said that after meditation (T2), the participants became better at performing the task (and thus exhibited better performance in trial 1) but then become bored after realizing that it was the same task as in T1, which led to worse performance in trials 2 and 3. These issues should be addressed in future research aiming to test the effects of mindfulness. It should be noted that it would be inappropriate to reach any final conclusions about these findings, as the sample size for this experiment was quite small.

Because of the small sample size and other limitations in methodology, the present study can be seen as a pretest of the effects of mindfulness on the anti-saccade task. In its current design, it fails to find robust effects, suggesting that short mindfulness interventions have no influence on the brain and neurobiological measures of volition and self-control. The field of mindfulness and neuroscience is, however, still in its infancy and full of contradictory findings. Previous research has found that mindfulness is associated with changes in the brain (Kral et al., 2019; Taren et al., 2017); however, more recent and conservative research has found no structural changes after mindfulness practice (Kral et al., 2022). These controversies point to the need for more research in the field.

This study has many shortcomings, including its small sample size consisting mostly of females, lack of a control group, and short mindfulness intervention. These limitations were due to a lack

of resources to implement a larger study; however, we chose to perform it as a trial test to gather experience and learning for a future study.

The present study can be expanded as an attempt to contribute to the understanding of the neurobiological mechanisms of mindfulness and self-control, as well as to the question of whether mindfulness practice can change the brain. We recommend that this be done as an RCT with an active control group, a larger sample (70 participants in each condition), and a scientifically tested mindfulness intervention (preferably MBSR).

We recommend the use of MBSR because it has been tested in other studies, and it is a somewhat popular and replicable protocol. There is wide availability of MBRS programs for individuals aiming to learn mindfulness as well as structured teacher training programs that ensure a certain level of consistency in interventions. This will facilitate scientists' ability to compare findings across different mindfulness studies, which is currently a problem.

These results are relevant to meditation practitioners and policy-makers interested in implementing mindfulness interventions for compulsive consumers. The specific way in which mindfulness was practiced by the participants in the present study generated a trend toward a resource depleting effect in the anti-saccade task; however, more research is needed to establish any conclusions.

11. Conclusion

In the study presented in this paper, we tested the effects of two weeks of daily mindfulness meditation practice on anti-saccade task performance. Because mindfulness meditation causes alterations in the same brain structures assessed by the anti-saccade task (the DLPFC), we hypothesized that two weeks of meditation practice would have an effect on anti-saccade performance. This hypothesis is based on theories of neuroplasticity that explain how both internal and external stimuli such as the habit of meditating have the potential to alter brain structures and functions, even in adult brains. We performed a within-subject design test and found a trend in the worsening of performance after meditation practice. This suggests that this dose of mindfulness meditation depletes self-control and volition resources as measured by the anti-saccade task; however, limitations in our study design prevent us from drawing

conclusions. To the best of our knowledge, this is the first paper to test anti-saccade performance after meditation practice, and tests with a more rigorous research design can be done to conclude whether mindfulness has an effect on the anti-saccade task.

Policy-makers aiming at promoting self-control in consumption and other areas of life should know that the intervention used in this paper leads to lower levels of self-control in the anti-saccade task. This suggests that mindfulness meditation consumes neural resources and can be explained by research stating that mindfulness is effortful and resource depleting for novice practitioners. More research is needed to confirm these findings, as they are trends and not significant results.

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Integrated Discussion Chapter

Integrating Findings in the Study of Mindfulness and Consumer Research

Letícia Vedolin Sebastião

1. Introduction

The three papers in this dissertation represent an effort to explore the field of mindfulness and consumption (article 1) and test the influence of mindfulness in specific contexts with implications for consumer behavior (articles 2 and 3). To explore and test the effects of mindfulness on consumer behavior in a holistic manner, we made use of different methodologies, applying both social psychological experimental techniques and biometric techniques. The present chapter aims to integrate the findings from the three articles and to derive the overall contribution of this dissertation as well as provide final insights from the research process.

2. Summary of findings

This dissertation consists of three articles within the themes of mindfulness, consumption, and self-control. My coauthors and I began with a systematic literature review of the literature on mindfulness and consumption. In article 1, we analyzed the literature on mindfulness and consumption and proposed a classification of the papers in the field according to the different types of mindfulness. We identified three camps of mindfulness and consumption in the literature; described these camps of mindfulness; and reviewed the research findings within each camp of mindfulness. We then judged the consistencies and inconsistencies in the literature according to this classification. We found that authors in the field combine studies in the three camps of mindfulness as if they were the same. According to our review, however, the three camps of mindfulness have fundamental differences, and researchers should account for these differences. We have found that the research on mindfulness and consumption that impacts the individual, such as that involving food, alcohol, cigarettes, and electronic media, is consistent in the different camps of mindfulness. However, when testing the effects of mindfulness on consumption that impacts the environment, namely, sustainable consumption, there are inconsistencies in the findings across them. While all types of mindfulness lead to higher self-control in the consumption of food, alcohol, cigarettes and the internet, there is a lack of evidence that learned mindfulness leads to more sustainable behavior. We also found that researchers fail to control for trait mindfulness when testing learned mindfulness, which can

lead to an overestimation of effects. Based on these findings, we then decided to test aspects of mindfulness on self-control and virtuous consumption in an individual context.

In the second article of this dissertation, we tested the effects of mindfulness on virtuous consumption under uncertainty. Uncertain situations such as sanitary and financial crises lead to ego depletion, which in turn reduces consumers' capacity for self-control and virtuous consumption decisions (Milkman, 2011). While previous research on mindfulness suggests that it leads to lower ego depletion (Friese et al., 2012), other researchers state that mindfulness can be effortful and therefore deplete cognitive resources (Creswell, 2017). To establish whether mindfulness can contribute (or not) to self-control under uncertainty, we performed a series of empirical studies. Initial evidence was found in one of the studies that mindfulness can impact consumer attitudes by reducing intentions to choose *want* options instead of *should* options in a context of high uncertainty. *Wants* are consumption options that minimize long-term gains and increase short-term rewards, whereas *shoulds* have reduced short-term rewards but yield long-term gains. This finding is in line with the extant literature on mindfulness and consumption. Additionally, on a pretest, we found that two weeks of daily mindfulness meditation practice leads to a trend toward lower ego depletion under uncertainty.

Finally, the third article aims to establish a biometric measure of volition and self-control (the anti-saccade task) as a viable way to measure the effects of mindfulness on self-control. We performed a test where participants took the anti-saccade task before and after a period of two weeks of daily learned mindfulness. Most of the outcome measures in the performance of the task were not altered; however, there was a trend in the worsening of performance in one of the measures, suggesting that this dose of mindfulness practice might deplete neurobiological resources involved in self-control. This can also be explained by the participants becoming tired of the test over time.

The findings from the three articles lead to a deeper understanding of the nature of mindfulness as well as its effects on consumer attitudes and behaviors. From article number 1, we learn that there are at least three camps of mindfulness in the literature and that they differ in their assumptions about mindfulness per se as well as their effects on consumers. From article number 2, there's initial evidence that in the context of uncertainty, mindfulness can regulate consumer intentions to indulge. In article number 3, there is also initial evidence that

mindfulness might deplete cognitive resources, although this could be a methodological problem in the research design.

In the study presented in the second article, we asked participants about their daily mindfulness practice, which was our measure of mindfulness. It may be that if we had created a long-term controlled intervention, different effects would have been found. The study presented in article number 3 can be seen as a pretest of a larger trial. Due to the limited resources available during a PhD fellowship, it was not possible for us to run a larger study, so we chose to run a smaller test instead. We recommend that researchers interested in the biometric effects of mindfulness use our test as an inspiration. This test could be replicated with a larger sample, a control group, and a longer mindfulness intervention. Mindfulness-based stress reduction could be taught to participants in a between-subject design experiment. This would allow researchers to obtain more conclusive findings.

3. Bridging the theory and findings from the articles

Throughout this thesis, different theoretical lenses were used. We used theories of personality and neuroplasticity as well as ego depletion theory. The empirical findings of the thesis relate to ego depletion theory (Boumeister and Vohs, 2007). We are aware of the controversies surrounding this theoretical frame and know that there is both evidence of the validity (Hagger et al., 2010) of this theory as well as evidence challenging it (Carter et al., 2016).

Ego-depletion theory stems from the strength model of self-control, which proposes that self-control demands resources drawn from a limited source (Hagger et al., 2010). Once a person exerts self-control on a task, they become less capable of self-controlling on a subsequent task. The analogy used by researchers is that of a muscle that, when tired, becomes less capable (Baumeister and Vohs, 2007). To exert self-control again, the person needs to replenish resources by resting, relaxing (Tyler and Burns, 2008) or increasing glucose levels in the organism (Gailliot and Baumeister, 2007).

Examples of instances where self-control is needed are varied and present in consumers' daily lives. From being able to say no to dessert to refraining from drinking too much alcohol or abusing drugs, self-control influences academic performance and violent behavior. Even

conditions such as cancer and heart disease can be directly or indirectly determined by self-control (Hagger et al., 2010).

Our findings are in line with ego depletion theory in the sense that many of the behaviors influenced by mindfulness are also influenced by self-control. As shown in our literature review, eating, drinking alcohol, smoking cigarettes, and abusing substances are influenced by mindfulness practice and demand self-control to be regulated. Additionally, in our second article, uncertainty can be seen as an extra source of resource depletion. Uncertainty, as previously found in the decision-making literature, demands cognitive resources needed to make *should* choices (Milkman, 2011). Our third article measures an implicit form of self-control through biometric methods, where we find an indication that mindfulness might demand resources from consumers.

We therefore contribute to ego-depletion theory by introducing mindfulness as a source of extra self-control (articles 1 and 2) and a source of extra ego-depletion (article 3). These findings are contradictory, and new research can be performed to better understand in which conditions mindfulness contributes to self-control and in which it is detrimental toward it.

In article 3, our sample mostly consisted of meditation novices, individuals whose first experience with mindfulness practice was our experiment. In article 2, the opposite occurred. We had mostly experienced meditators in our sample. This can indicate that the effects of mindfulness are different for novices and experienced meditators. It may be the case that, for novices, mindfulness meditation depletes resources because it demands effort. When the participant is more experienced with meditation, it is likely that mindfulness will replenish self-control resources such as relaxation and rest. This is in line with the findings reviewed in our first article, where mindfulness is shown to be an aid in consumer self-control. Previous findings in the mindfulness research substantiate the abovementioned hypothesis as they show that mindfulness practice is resource demanding for those who are new to the practice (Creswell, 2017). They further show that, with experience, mindfulness practice becomes automated (Tang, 2015).

In addition to contributing to self-control and ego-depletion theory, this dissertation sheds new insights into mindfulness theories that dwell on self-regulation. Self-regulation is a “process by which a system regulates itself to achieve specific goals” (Shapiro and Schwartz, 2000, p. 254).

Examples of this include quitting smoking, regulating how much one eats or drinks, preparing for an exam at school, or establishing the habit of exercising. Many of the instances where self-regulation is needed are examples of consumer behavior that also demands self-control. In fact, the concepts of self-control and self-regulation are frequently used interchangeably (Nigg, 2016).

Self-regulation, however, is a broader concept than self-control (Nigg, 2016). While self-control denotes top-down processes of resisting short-term rewards toward the benefit of long-term gains, self-regulation includes both top-down and bottom-up processes (Nigg, 2016). Top-down processes refer to Type 2 or System II processes (Kahneman, 2011), which are deliberate, slow, and based on working memory. Bottom-up processes refer to System I from a dual-process perspective and are fast and automatic. It is important to note that the dual-process perspective is a simplification of cognitive and behavioral functioning (Nigg, 2016) and that it is most suited to think of a consciousness continuum (Dehaene et al., 2006).

Mindfulness is defined as a form of conscious self-regulation (Shapiro and Schwarz, 2000; Shapiro et al. 2006) and therefore has the potential to help individuals regulate how much they consume (Tang, 2015). Self-regulation refers to the "intrinsic processes aimed at adjusting mental and physiological state adaptively to context (…) in order to achieve an explicit or implicit goal or goal state" (Nigg, 2016, p. 4). Self-regulation demands cognitive control and emotion regulation, along with top-down and bottom-up processes (Nigg, 2016). Self-control refers to a top-down aspect of self-regulation, meaning the capacity to resist temptation and "override a stronger stimulus-driven representation with a weaker, memory-driven representation" (Nigg, 2016, p. 4).

Examples of self-control are prevalent in a consumption context and include resisting the urge to eat candy and choosing to eat fruit instead, quitting smoking, and regulating how much alcohol one drinks at a party. All these examples demand that consumers adjust their mental state and behavior to resist cues created by marketeers and other consumers to promote (over)consumption. As reviewed in the first paper of this dissertation, mindfulness practice is an aid in resisting such cues because it deautomatizes consumers' reactions (Kang, Gruber and Gray, 2014) to the cues and awards them time to choose an alternative behavior (Kabat-Zinn, 2013).

Mindfulness would therefore be a form of top-down regulation, although more recent research has found that self-regulation through mindfulness practice can also occur automatically, without the individual's consciousness (Tang, 2015). Mindfulness includes attention and intention in self-regulation (Shapiro and Schwartz, 2000), and it is proposed that the intention with which one infuses the mindfulness practice will correlate with the outcomes achieved with the practice (Shapiro et al., 2006). In the second paper of this dissertation, we contribute to the body of research on mindfulness by proposing that mindfulness counteracts the depleting effect of uncertainty on self-control.

Finally, in the third paper of this dissertation, the concept of inhibition is introduced. Inhibition is also closely connected to self-control and self-regulation, in our study taking the form of attentional inhibition. This is defined as "ignoring a stimulus that is competing for attention to enable focus on goal-relevant information" (Nigg, 2016, p. 3). Inhibition is one of the executive functions, which are also forms of top-down control.

This dissertation is therefore concerned with different types of self-regulation when affected by mindfulness. These concepts are interconnected and are sometimes used interchangeably; however, there are differences between them (see the Introduction for a summary of the concepts). Failure in these different types of self-regulation leads to different psychological pathologies, including malefic consumer behavior (Nigg, 2016), which is the type of consumption studied in this dissertation.

The marketing scholarship is concerned with counteracting these forms of malefic consumption, as it is the responsibility of marketing scholars to find solutions for the negative effects of marketing in society (Achrol and Kotler, 2011). This dissertation can therefore be placed in the frame of transformative consumer research (Davis, Ozanne and Hill, 2016), contributing to consumer well-being.

4. Learnings from this dissertation

Taken together, the findings from this dissertation point to some important concepts that can help researchers in the field of mindfulness and consumption.

4.1. The dose of mindfulness practice needed for certain outcomes is still unknown:

As illustrated in our literature review, there are many types of mindfulness interventions and measures and a lack of guidance concerning what measures and interventions are associated with particular types of outcomes. This makes it difficult for researchers to draw conclusions from studies. In our case, it was difficult to choose a mindfulness intervention for our studies because we did not know how much time an individual should practice before experiencing an impact on the dependent variables we were studying.

It is known that MBRS, which is an 8-week intervention, has effects on depression and anxiety (Strohmaier, 2020); however, it is not known whether the length of periods of practice will affect these outcomes. In summary, the dose of mindfulness practice recommended for each outcome is still not known. Taking this into consideration, we can conclude by saying that the dose of mindfulness in our studies led to the outcomes we found, but that we are not certain whether different doses would yield different results.

We therefore recommend that researchers in the field of mindfulness maintain clarity about the dose of the intervention they use in their studies. It may be a good idea to identify the dose in research paper titles. Additionally, we encourage those entering the field to perform meta-analytical research to test aggregate effects from a pool of papers. This will allow researchers to reach more conclusive findings about effects and doses.

4.2. Mindfulness research is resource demanding

We performed experiments with mindfulness interventions, and it became clear that such interventions demand special resources. First, a trained mindfulness teacher is needed to perform the intervention. We adapted a previously validated intervention that was available online, so we did not have to hire a teacher. The main researcher in this paper is training, with support from the Copenhagen Business School PhD School, to become a trained teacher and in the future will be able to run her own interventions. We are therefore grateful to the PhD School

for the support in developing the human resources needed to run mindfulness research. The training takes several years and involves online courses, silent retreats, and teaching hours under the supervision of more experienced teachers. This training is offered by Brown University, an institution with experience in developing mindfulness teachers.

Other resources needed for experiments are a large number of participants willing to practice mindfulness. We had to recruit students who had the time to undergo a mindfulness intervention during their semester. Not everyone is willing to dedicate time and effort to mindfulness. One way of addressing this challenge was to offer a monetary reward, which luckily was available through one of the coauthor's research accounts.

Third, we needed space and equipment. As our studies also involved eye tracking technology, we needed the right equipment and the right space. We had to borrow an eye tracker from a partner because the one available at CBS is not suited for the tests we were running. This placed a limit on how many participants could join the study due to the availability of the eye tracker. We also needed a lab space at CBS that was fortunately available to us.

Comparing all this effort with experiments that are performed solely online – through panels such as Amazon Mechanical Turk – it is evident how conducting mindfulness research demands much more effort in terms of funding, human resources, space, and time. This probably demotivates research in the field in business schools, where the tradition has been to run online studies with large samples and little time. We, on the contrary, call for more research in the field. Mindfulness research can be very beneficial for consumers, business, and society. Even though it is resource demanding and risky in terms of publication potential, we encourage researchers to enter this field.

4.3. One can never be too cautious about the effects of mindfulness on consumers

After analyzing the findings stemming from the papers in this thesis, we can conclude that mindfulness is not a silver bullet solution, as is sometimes claimed in popular media. Mindfulness is not always effective; we should be cautious about asserting claims about the outcomes of the practice in both research papers and the media.

When thinking about the strength model of self-control, we should consider that having the habit of practicing mindfulness does not always counteract resource depleting activities. Outcomes of studies on self-control and mindfulness may vary based on whether participants practice mindfulness in a lab.

The special case of mindfulness and sustainability research should also be analyzed in detail. In our literature review, we found that mindfulness is correlated with a sustainable mindset but does not cause it. In other words, sustainability is correlated with trait mindfulness; however, mindfulness practice does not lead to sustainability. This is in line with recent findings that have established that proving causality is the next challenge in this research field (Thiermann & Sheate, 2021). It also challenges previous research that assumes that mindfulness could solve environmental problems faced by society (Bahl et al., 2016). As pointed out by mindfulness researchers (van Dam et al., 2018), these overpromising accounts of mindfulness may have created a hype where the practice is put forth as a panacea. It is my view that researchers should be cautious when claiming the benefits of any new practice, including mindfulness, and they should maintain clarity about the limitations of any outcomes related to mindfulness research.

5. Limitations and future research opportunities

Future tests of neurobiological processes of mindfulness and consumption are welcome in the field, as there is little research performing such studies. Understanding the subconscious processes in mindfulness and compulsive or virtuous consumption as well as sustainability will illuminate the field and help answer questions such as whether meditative mindfulness can truly lead to more sustainable consumption. Furthermore, the neural processes behind sustainable behavior are not yet understood, which can be a contribution of research that bridges neurobiological mindfulness and sustainable or green behavior.

Future tests establishing that meditative mindfulness leads to self-control in consumer behavior under uncertainty, and not only consumer intentions, would be an addition to the field. Our studies with participants who already practice meditative mindfulness mainly test consumption intentions – although with different levels of realism. Finally, tests in neurobiological

mindfulness and sustainable consumption seem to have great potential for new discoveries and may be able to help differentiate sustainable from compulsive behavior.

Another limitation of this dissertation that can be addressed by future research is the research design of our experiments. Our tests with two weeks of meditative mindfulness (in both Articles 2 and 3) had a somewhat limited sample (n = 28) and were within-subject design tests. We chose the within-subject design to prevent cofounding factors, taking into consideration that we did not have a perfectly randomized sample. This design choice, however, has some shortcomings such as the possibility that participants learn how to answer the questions we pose, leading to an increase in performance that is not due to practiced mindfulness. Future research can aim to replicate our studies with a larger sample size and a between-subject design.

6. Conclusion

In this final chapter of my dissertation, I integrate the empirical findings from the three papers in the thesis. I discuss how different doses of mindfulness lead to different effects and present some of what I have learned in writing a thesis on mindfulness research.

To the best of my knowledge, this thesis is the first to find that practiced mindfulness can lead to a trend in changes in anti-saccade performance (Paper 3), the first effort to test mindfulness under uncertainty (Paper 2), and the first to systematically review the literature on mindfulness and consumption across different fields (Paper 1).

We contribute to the literature by furthering the understanding of the outcomes and processes involved in consumer behavior change through mindfulness. We also believe that this is a fruitful field of inquiry that leads to contributions to the understanding of the mind and to practical developments that can help consumers and policy-makers. Those aiming to regulate their consumption can find knowledge in this dissertation regarding the mindfulness dose needed to attain different effects and the way in which mindfulness leads to consumer behavior change. Furthermore, marketeers with the aim of promoting mindful consumption as a CSR strategy can find inspiration in this dissertation.

I encourage researchers and policy-makers to add to this field as I aim to continue the work with mindfulness and consumption.

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Reflection Chapter

My Journey as a PhD Student at CBS: A Story of Perseverance and Collaboration

Letícia Vedolin Sebastião

I began work on my PhD in September 2019. Five months after the start of my studies, the COVID-19 pandemic hit, and the world was forced into isolation. Even though I tried to mitigate the effects of the pandemic on my studies, after March 2020, the world was a different place. Classes were adapted to an online format, and opportunities to meet people at the department's coffee machine were gone. We all had to deal with being isolated, distant from our families and friends as well as get used to working from home. I lived in a 9 square meter room where I slept, worked, exercised, ate, and socialized – if you can say calling my friends and family classifies as socializing. I had to create a routine that allowed me to complete my studies, even though my work and life conditions had completely changed. I mention this because I think contributed to my learning during my PhD. I learned about discipline and being organized, and I learned about dealing with my emotions.

During this time, I set a routine where I would write for one hour each day, every day. That is how I spent most of my period as a PhD fellow. I have a friend who says we should swallow the biggest frog first thing in the morning. My biggest frog of the day was my writing assignment. Therefore, I would wake up each day, have my breakfast, meditate, and write. That was my routine for a long period of time. When I had internalized this way of working, I decided to share it with others. Therefore, I set up an online meeting where my colleagues and I would meet to write. In those meetings, we each had to have a writing goal and wrote for 40 minutes. I continued this practice while I was in Brazil with my family when the pandemic allowed me to travel.

After writing in the morning, I would spend two more hours reading material to be addressed in my writing the next day. Those two hours were spent reviewing the extant research and studying papers. In that way, when the next day came, I would know exactly what I needed to write. This process made my writing much more productive. During the remaining hours of the day, I dedicated my time to other tasks of the PhD, such as attending courses, collecting and analyzing data and teaching and grading exams.

Data collection was also affected by the COVID-19 pandemic, as I was not able to use the lab during most of my studies. As soon as the lab was open, I conducted data collection. I had to recruit participants for both online and offline studies, which involved obtaining funding to compensate them. My supervisors were generous and allowed me to use their funds to compensate the participants, but I learned that as a researcher, I will need to have my own funds

for data collection. I also had to analyze data, which was a big challenge for me. I had classes that taught me how to do this, but I tend to feel insecure when running statistical tests. I therefore asked my coauthors for help with that.

During this time, I was able to attend some online conferences. I attended the 2020 EMAC Doctoral Colloquium, where an earlier version of the two first papers in this thesis were presented and discussed. This Doctoral Colloquium was especially influential for the second paper of the thesis. It was also where I met one of the members of my committee. Later, in 2021, I presented a revised version of the first article of this thesis at ACR. I am very grateful for all the opportunities throughout this process to discuss my research as well as that of my colleagues.

That brings me to the next point of this reflection chapter: collaboration. One thing that I have learned is that you cannot do research alone. It is always the work of a team of people interested in the same topic. I was lucky enough to put together a team that worked together well. That team consisted of my two supervisors, Jesper Clement and Torsten Ringberg, and one coauthor for one of the papers, Florian Kock. I learned a lot from every member of my team, each of whom helped extend the reach of our research. As a result, we have had our three papers under review in important journals, such as Journal of Business Research, Journal of Marketing and Public Policy, Journal of Consumer Affairs, and Frontiers of Psychology. We have had two rejections and two opportunities to resubmit. We have learned from our shortcomings and are currently working on reviewing papers aimed at competitive journals.

Collaborating also means that I have to allow other people to contribute in the research process and that not all of the ideas in the papers are mine. It was very enriching for me to allow others to contribute their ideas and points of view to my PhD. This means that even though it is my PhD, this work is the result of the collaboration of individuals with different perspectives.

The last point that I want to address in this reflection is that of perseverance. While pursuing my PhD, I was met with different obstacles. At some points, I thought my data were too weak and I could not work with them. Other days, I had a very hard time communicating my ideas. These are just a few examples of hurdles a PhD student can face during the three-year period we have to complete our studies. My journey as a PhD student taught me that I can overcome these

obstacles as long as I ask for help and persevere. With that attitude, not only have I been able to meet my goals, but I have learned from my supervisors how to solve problems as a researcher.

After these three years as a PhD Fellow at CBS, I can say that I have learned about my topic but also about the requirements of being a researcher. I know, however, that I have a lot more to learn. Looking ahead, I am eager to continue learning with my peers and students.

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