Mindfulness and Sustainable Consumption

A meditation-based intervention study
exploring the mediating power of
resourcefulness and prosocial tendency

Authors: Rocío Rodriguez Martinez | Student no: 133219
Verena Doris Singer | Student no: 133792

Supervisors: Letícia Vedolin Sebastião, Jesper Clement

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Abstract

Mindfulness and its cultivation, rooted in ancient Buddhist meditative practices, has the power to transfer people into an openhearted, non-judgmental, and accepting mind state toward present moment experiences. A growing body of research has identified some highly effective pathways through which mindfulness can enhance consumers’ engagement in sustainable consumption and thereby help tackle a challenge of global priority. Of these pathways, the mechanism of prosocial behavior and connectedness as well as resourcefulness, which is the extent to which an individual feels abundant in their personal resources, have received the least attention in research so far. Thus, the present study aims at providing a deeper understanding of these pathways and at advancing infant empirical insights into the role and power of resourcefulness and prosocial tendencies.

Building on advances in research on mindfulness, sustainable consumption, consumer behavior and psychology, we propose that state mindfulness stimulated by a short loving-kindness meditation practice encourages sustainable consumption through resourcefulness and prosocial tendency. Thus, a randomized, meditation-based intervention study with an active control group is conducted to test the predictions of this serial mediation model. We did not find significant support for our model presumably due to resource limits and restricted conditions under which the experiment was run. However, the methodological approach and design of this study is much sought-after by scholars calling for more robust empirical evidence in this field of research. Based on these outcomes, we offer contributions to theory on the pathways of mindfulness to sustainable consumption. We also derive relevant implications for public policy makers and managers in their pursuit of sustainability-related goals. Limitations and promising avenues for future research are discussed.

Keywords: Mindfulness, Loving-kindness meditation, Sustainable consumption, Prosocial behavior, Resourcefulness, Serial mediation, Experiment
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A. INTRODUCTION

“As we were already warned decades ago, there are limits to growth, and we are reaching them as predicted” (Lopez-Claros et al., 2020, p. 4). Referring to the development of our modern Western world throughout the past years, this statement points quite clearly to the grand environmental, social, and economic challenges which societies of the 21st century are facing. Human welfare cannot be sustained, let alone improved, on this earth if its populations continue to push beyond planetary boundaries with their actions and behaviors. Not surprisingly, continuous efforts in sustainability have become imperative for both research and practice (Lopez-Claros et al., 2020; Reisch & Thøgersen, 2015).

It is not only public policy makers and businesses who are urged to innovate and reinvent existing systems and strategies to protect and preserve the environment, but also every single individual walking this earth needs to become aware of their impact and can contribute to the common good and future sustainable development especially in the choices they make in their role as modern consumer. The average adult makes around 35,000 conscious decisions each day, of which 226.7 are on food alone according to researchers (Williams, n.d.). Thus, it is extremely likely that a huge amount of our daily decisions is related to how we behave in the cycle of consumption which includes the selection, acquisition, use, and disposal of products and services. On a positive note, the majority of people and especially millennials nowadays are very committed to sustainability. However, this attitudinal commitment often does not translate into actual ecologically conscious consumption behaviors (White et al., 2019b). This attitude-behavior gap is an interesting and complex phenomenon which, among other constructs, has been picked up by sustainable consumption research in recent years. The field of sustainable consumption research in general has received growing scholarly attention since the 1990s and despite generating invaluable insights and empirical knowledge, it is still in its infancy and a lot of open questions remain yet to be answered (Reisch & Thøgersen, 2015).

The answer to why people, especially when being consciously aware of the sustainability issues that threaten both current and future generations, do not act accordingly, appears to be even more difficult to uncover given the fact that humans have an innate tendency to act prosocially
Advances in social psychology research posit that humans have evolved to engage in caring acts of kindness, helpfulness, and generosity first and foremost because voluntarily acting to the benefit of others can in fact increase an individual’s own reproductive fitness and thereby outweigh potential costs for the self, caused by the act of helping. Over time, these prosocial behaviors have established a state of interdependence of humankind which requires us to coordinate and collaborate as we navigate through life and strive to achieve our goals (Tomasello, 2014).

Then, how come that despite being predisposed to act prosocially, modern societies are experiencing such a big sustainability dilemma regarding the mismatch of attitudes and behaviors? It may be that this innate tendency is overshadowed by modern consumerism and the prevalent competitive, self-focused performance orientation of today’s world to such an extent that people have entirely lost their connection to it. We suggest that mindfulness may be the way out.

The concept of mindfulness has increasingly sparked interest among researchers during the past few decades and has proven to be very powerful in improving many aspects of human well-being (Hart et al., 2013). In this particular context, mindfulness may help people disconnect from all the outside noise and pressure of the modern world and return to the self. Certain meditative mindfulness practices have also shown to cultivate qualities like kindness, compassion, empathy, and resourcefulness which is a feeling of perceived abundance in personal resources and a genuine willingness to share them with others (Weng et al., 2013; Birnie et al., 2010; Orazi et al., 2021). In that sense, mindfulness may be a pathway to reconnect with this human tendency to act prosocially and consequently foster more sustainable consumption.

There is a growing body of research investigating the relationship between mindfulness and sustainable consumption and some publications have also touched upon the role of resourcefulness and prosocial behavior in this context (Geiger et al., 2019; Barbaro & Pickett, 2016; Panno et al., 2018; Orazi et al., 2021). However, authors agree that the research approaches of many existing studies suffer from serious methodological issues and they point out that robust empirical evidence in this field of research is still very scarce (Fischer et al., 2017; Geiger et al., 2019). Moreover, to the best of our knowledge, there is no publication to date which explored the potential mediating
role of resourcefulness and prosocial tendencies in the relationship between mindfulness and sustainable consumption.

In order to bridge this gap, the present research builds on initial empirical evidence and conducts a randomized, meditation-based intervention study with an active control group to elucidate the research question of how meditative state mindfulness impacts consumers’ sustainable consumption decisions. It further seeks to explore the sub-questions of how this relationship is influenced by and related to the cultivation of a heightened sense of resourcefulness and a tendency to behave prosocially. A conceptual model proposing a serial mediation is developed and tested.

In doing so, this thesis follows a two-fold purpose. First, it provides a deeper understanding of the pathways through which mindfulness may enhance consumers’ engagement in sustainable consumption. Second, it advances existing empirical insights into the role and power of resourcefulness and prosocial tendencies in the mindfulness and sustainable consumption research.

Our efforts in tackling and investigating the research question of this thesis are divided into five main project parts. In what follows, they are briefly outlined to offer a clear and concise overview of the structure and contents of this thesis.

First, the introduction sets the tone for the present study by embedding it into the thematic context from both a theoretical and practical lens. Derived from this, the identified research gap and problem statement guide the reader toward the formulation of the research question and its sub-questions. Further, the relevance and purpose of this study are highlighted.

Second, to position our project in and explore the current state of literature in the research area of our interest, an extensive theoretical background is provided including four chapters which review extant literature, models, and theories related to the topics of (1.) mindfulness, (2.) resourcefulness, (3.) prosocial (consumer) behavior, and (4.) sustainable consumption.

Building on this theoretical backdrop, the third part of the thesis is dedicated to our empirical research. It covers (5.) the development of the conceptual model and its hypotheses,
and (6.) the presentation and discussion of our experimental research design and methodological approach, including the sample selection, the study procedure and experimental conditions, the operationalization of the used measures, and reflections on reliability and validity of our research. This part finishes with a chapter on (7.) data analysis and results in which descriptive statistics are explained before diving deeper into inferential statistics including the analysis and results of the between-group comparison with several statistical tests and the correlation analysis of the proposed conceptual model by means of the Pearson correlation coefficient. The chapter closes with a serial mediation analysis and the testing of our hypotheses.

Finally, the thesis ends with a discussion and conclusions part in which a (8.) general discussion of our empirical findings is given and both (9.) theoretical contributions to scientific research and (10.) managerial implications for public policy and business practice are outlined. The project is rounded off by an acknowledgment of its (11.) limitations and avenues for future research are proposed.

B. THEORETICAL BACKGROUND

1. Mindfulness

This chapter aims at exploring the concept of mindfulness. The two existing schools of thought are distinguished and light is shed on the history of mindfulness research including its major findings regarding the mechanisms and effects of mindfulness on human beings.

1.1 Definitions and Schools of Thought

There is no doubt that the concept of mindfulness has become a trending topic lately and that it has generated much interest in research, business practice, and society in general over the past decades. Mindfulness can be defined as “enhanced attention to and awareness of current experience or present reality” (Brown & Ryan, 2003, p. 822). However, it is important to note that there is no clear and unique definition of mindfulness. Instead, two different, parallel streams of mindfulness research appeared in academia: meditative mindfulness led by Jon Kabat-Zinn and
established in the context of health sciences and creative mindfulness driven by social psychologist Ellen Langer (Hart et al., 2013).

On the one hand, meditative mindfulness takes an Eastern perspective, dominated by Buddhist practices, which view mindfulness as the awareness that arises “from paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Hart et al., 2013, p. 454). As its name reveals, this literature stream relies on the use of meditation practices as the primary method of mindfulness interventions. These practices are centered around paying attention to one’s breath or body and, more often than not, are based on some element of the eight-week Mindfulness-Based Stress-Reduction (MBSR) program developed by Kabat-Zinn. This program employs a combination of meditation practices, group discussions, exercises, and yoga to improve trait mindfulness in individuals (Hart et al., 2013). It can be stated that introspection is the focus of this school of thought which leads to the cultivation of a non-striving, tolerant, and observing attitude. Summarizing the core of meditative mindfulness, Neff (2003, p. 224) describes the concept as “a nonjudgmental, receptive mind state in which individuals observe their thoughts and feelings as they arise without trying to change them or push them away, but without running away with them either.”

On the other hand, creative mindfulness is inspired by Western practices and defined by Langer (2014, p. 11) as “an active state of mind characterized by novel distinction-drawing that results in being (1) situated in the present; (2) sensitive to context and perspective; and (3) guided (but not governed) by rules and routines”. This stream emphasizes the need to have an open and conscious awareness as well as to be open to new things and to multiple perspectives. According to Langer (2014), it is all about being present in the current moment and avoiding acting in an automated mode of mindlessness since this would only make the past determine the present. Moreover, this perspective is related to creativity and problem-solving and research under this school of thought generally makes use of brief instructional interventions to induce state mindfulness in individuals which enhances their attention to and creative cognitive processing of external stimuli (Hart et al., 2013).
Notwithstanding the differences between the two definitions of mindfulness, it becomes clear that both put emphasis on focused awareness of the present moment and self-regulation of attention. In fact, the mindfulness concept developed by Langer may actually be treated as a substructure of the multi-faceted mindfulness model developed by Kabat-Zinn (Hart et al., 2013). It is also noteworthy in this context, that Langer considers these two conceptions of mindfulness as two different ways to get to the same place and she states that “when we become mindful either in our waking state by allowing and encouraging all of our senses to notice novelty or through meditation, the outcome is the same” (Langer, 2014, p. 17).

In the context of this project, we choose to follow the meditative mindfulness approach by Kabat-Zinn for two intuitive reasons. First, taking this view allows for the use of meditation interventions in our research design. Second, most of the reviewed research related to the examined variables, which make up the conceptual model of this project, equally lends itself to the concept of meditative mindfulness.

1.2 Research History

Academic work on the concept, various mechanisms, and potential effects of mindfulness on individuals has picked up speed since the 1970s and many studies to date provide empirical evidence for the contention that mindfulness improves a myriad of physical and psychological well-being aspects such as happiness, vitality, health, and cognitive performance (Hart et al., 2013).

In research practice, mindfulness is generally conceptualized either as state mindfulness or trait mindfulness (also called dispositional mindfulness). As implied in the expressions, mindfulness can be referred to as a state of present-moment awareness and extended consciousness practiced during meditation while trait mindfulness describes one’s general tendency to be mindful and “to attend to present moment experiences in everyday activities” (Shapiro et al., 2011, p. 269; Brown & Ryan, 2003). Without mindfulness-based interventions, trait mindfulness has shown to remain stable but repeated meditation practice can support the cultivation of deeper states of mindfulness which in turn lead to increased trait mindfulness over time (Kiken et al., 2015).
In the clinical research context, many studies to date report a positive correlation between mindfulness trainings based on the MBSR program and the reduction of psychological symptoms (Biegel et al., 2009; Foley, et al., 2010). They demonstrate that depression, stress, and anxiety symptoms are reduced through the practice of mindfulness.

Another beneficial effect of mindfulness on human functioning detected by research is its great potential to help individuals better self-regulate their own emotions, thoughts, actions, and attention (Hart et al., 2013). It is believed that this self-regulation is enabled through the reperceiving process, that is, deliberately taking control over one’s own attention (Shapiro et al., 2006). According to Shapiro et al. (2006, p. 378) reperceiving can be described as “a rotation in consciousness in which what was previously subject becomes object.” In other words, this mechanism allows the individual to view their personal perception from a more objective perspective (Shapiro et al., 2006). In line with the idea of shifting perspectives, Langer (2014) also suggests that thanks to mindfulness, the individual realizes that outcomes are neither positive nor negative but just outcomes. Mindfulness helps individuals to be focused on the present moment and to let go of any judgmental attitude toward the outcome but instead just to analyze the outcome from different angles and accept it without judgment (Langer, 2014).

About two decades ago, researchers have also begun to investigate meditative mindfulness from a neuroscientific lens (Tang et al., 2015). Using neuroimaging research designs, they started to uncover both the short- and long-term neurophysiological effects of meditation on the human brain. Although neuroscientific knowledge on meditative mindfulness is still in its infancy, initial evidence exists supporting the power of mindfulness meditation to generate beneficial neuroplastic changes both in the structure and in the function of the brain areas associated with regulatory processes of attention, emotion, and self-awareness (Tang et al., 2015). Besides, the recently published Netflix documentary “The Mind, Explained: Mindfulness” (Klein et al., 2019) also reinforces these findings by reciting research which suggests that training in meditative mindfulness strengthens the link between the emotional and regulatory parts of the human brain.
2. Resourcefulness as Mechanism of Mindfulness

A novel construct which has only recently appeared in the mindfulness literature is resourcefulness. Initial empirical evidence suggests that it can be cultivated through meditative mindfulness and has the potential to positively impact individuals’ behaviors (Orazi et al., 2021). This chapter provides a definition of resourcefulness and a discussion of its relevance in relation to prosocial behavior as well as its role in mindfulness research.

Deeply rooted in human nature, people strive to acquire and conserve resources first and foremost in order to ensure their survival. But besides fulfilling basic needs, resources are also used for personal goal attainment and self-identity construction (Levontin et al., 2015). Resources can be classified as tangible in the form of physical assets and materialistic goods or as intangible (Levontin et al., 2015). The latter are also referred to as personal resources and can include cognitive, psychological, social, and physical resources. Examples for each of those dimensions are mindful and conscious thinking, environmental mastery, positive and supportive relationships with others, and energy (Fredrickson et al., 2008; Orazi et al., 2021).

Highly shaped by evolutionary processes, the perceived level of personal resources plays a critical role in determining the extent to which an individual chooses to engage in self- and/or other-focused behaviors (Levontin et al., 2015). To provide evidence for this, Levontin et al. (2015) applied the concept of resource deficiency and demonstrated that feelings of lack and emptiness, even if just metaphorically triggered, motivate people to focus their consequent actions more on their own welfare and disengage from other-focused behaviors.

Considering the following focus of this research on prosociality and sustainable consumption, which both thrive on people’s motivation and intention to act for the benefit of others rather than merely for their own, it appears very intriguing to explore potential drivers of this perceived level of personal resources. This is because the findings by Levontin et al. (2015) give rise to the reverse assumption that feelings of abundance and wholeness may drive people’s perceived level of personal resources and as a consequence, reduce their self-focused competitive orientation and increase their tendency to engage in more generous, other-focused behaviors.
However, such behaviors frequently include some cost to the self in the form of effort, time, or money and can thus be classified as costly altruism (Liu & Aaker, 2008; Gneezy et al., 2012b). An absolute prerequisite for actual engagement in costly altruism is an individual’s perception of having access to enough resources, actual or metaphorical, to share with others while simultaneously protecting the self from personal resource depletion (Levontin et al., 2015). Orazi et al. (2021) defined this perceived state of personal resource abundance as resourcefulness. We adopt this conceptual view in the remainder of this project.

Following the question of how such feelings of abundance and wholeness can be nurtured, it appears quite valuable to step into the field of mindfulness research. Both Gould (1991) and Grossman (2015) argue that via its dimensions of heightened awareness and non-judgmental acceptance of the moment-to-moment experience, mindfulness can boost or replenish the vital energy or resourcefulness available to an individual. In fact, Kaplan & Berman (2010) found in their study that, when put into a state of deliberate, directed attention via a natural environment intervention, people’s personal resources increase.

The idea that mindfulness may have the power to establish a state of resourcefulness is also backed by research which shows how mindfulness can help improve the regulation of emotions and attention (Brown & Ryan, 2003; Jha et al., 2007), restore resources for self-control (Friese et al., 2012), and increase controlled and deliberate usage of limited brain capacities (Slagter et al., 2007). Hence, through the mindful cultivation of awareness and acceptance, people do not get too invested with their own thoughts and feelings. They are better able to refrain from habitually engaging with energy-consuming and overwhelming thoughts and feelings related to the past and future, thereby freeing up valuable cognitive resources and presumably entering a state of higher resourcefulness (Orazi et al., 2021).

Some scholars have already begun to directly explore resourcefulness as a pathway of mindfulness. Applying meditative mindfulness, Fredrickson et al. (2008) showed that positive daily emotions cultivated through the practice of loving-kindness meditation can build a variety of personal resources, such as purpose in life and social support, which in turn increase life satisfaction. Moreover, Orazi et al. (2021) put forth initial experimental evidence for the mediating
effect of resourcefulness on the relationship between mindfulness and other-focused ethical behaviors.

While research on this novel mediator is still very scarce, the existing empirical work suggests that resourcefulness may be a powerful pathway of mindfulness particularly in the herein studied relationship between mindfulness and sustainable consumption (Orazi et al., 2021). To further elucidate its potential effects, resourcefulness will thus be included as a mediating variable in the conceptual model of this project.

3. Prosocial (Consumer) Behavior

3.1 Definition and Relevance in Research and Practice

It goes without saying that consumer behavior and decision-making have been among the most widely studied subjects of consumer research during the past decades. The study of consumer behavior allows for a better understanding of the reasons and motivations behind consumers’ choices and provides very useful insights for both research and practice.

In recent years, a new perspective of consumer behavior appeared and became the center of research in the consumer behavior and consumer psychology fields: prosocial consumer behavior. White et al. (2020) found that the term “prosocial consumer behavior” was discussed by more than 1,700 articles by 2018, while only above 400 articles existed ten years earlier, in 2008. However, before entering the field of consumption, it is important to clarify what exactly is meant by the more general term “prosocial behavior”. Even though the term prosocial consumer behavior is quite novel, the concept of prosocial behavior has been studied for a long time in the psychological field. Already in 1982 (p. 6), Eisenberg explained that prosocial behavior is used “to designate helping, sharing, and other seemingly intentional and voluntary positive behaviors for which the motive is unspecified or unknown.” Contributions by Bierhoff (2002) complement this definition by adding that prosocial behaviors can be described as actions which are intended to improve the situation of a help-recipient while not being triggered by professional obligations.
When prosocial behavior is applied to a consumption context, the involved action would be the activity of purchasing, using, or disposing of a product or service. According to Small & Cryder (2016, p. 107), “prosocial consumer behavior refers to purchase behavior involving self-sacrifice for the good of others or of society.” The same concept is also inherent in other terms like “other-focused behaviors”, “ethical consumption”, or “socially responsible consumers” (Levontin et al., 2015; Orazi et al., 2021; Mohr et al., 2001). For consistency within this project, we will use the term prosocial consumer behavior. Some examples of such behaviors include volunteering, charitable giving, ethical purchasing, altruistic behaviors, consumer advocacy, and other donation behaviors such as organ or blood donation (White et al., 2020). For an even deeper conceptual comprehension, it is also relevant to highlight here that altruistic behaviors can be understood as a form through which prosociality manifests itself. According to Barasch et al. (2014, p. 393), altruism “is characterized by a motivation to increase another person’s welfare and is presumed to be driven by a selfless concern for others.”

To better understand how exactly prosocial consumers behave and what their priorities and preferences are, it is interesting to examine the study by Medina et al. (2020). The authors analyzed how the variable of price influences consumer behavior. In their experimental study, they differentiated two types of consumers based on their tendency to make socially responsible buying decisions: prosocial and non-prosocial consumers. Findings suggest that prosocial consumers appear to place more weight on collective costs and benefits than on the price while buying. However, non-prosocial consumers place more importance on individual costs when making their daily purchases, in particular on the price. Furthermore, by means of a neuroimaging method, Medina et al. (2020) analyzed the neuro-activation in the consumers’ brains while they were evaluating the price information. The results show that the activated areas of the brain differed between the two types of consumers. In the case of the non-prosocial group, the activated brain areas were the ones associated with rewards, choice, and valuation of expected outcomes, which were not activated in the prosocial consumers. The reason for this is that prosocial consumers did not consider the price when making decisions because they based their decisions on other factors such as sustainability, their personal welfare and that of others, and thus, they focused more on evaluating if it was a fair exchange on a collective level (Medina et al., 2020). Shortly put, prosocial
consumers assess whether their purchase benefits not only themselves as individuals but also the society (Medina et al., 2020). This notion is further supported by other scholars who posit that prosocial consumers are characterized by higher self-transcendence values and social conscience than their non-prosocial counterparts (Ladhari & Tchetgna, 2017). Additionally, they are more likely to happily commit to sustainable consumption lifestyles due to a matching set of social and personal norms including a self-ascribed moral responsibility toward the environment and society (Golob et al., 2019).

Similar to the characterization proposed by Medina et al. (2020), Mohr et al. (2001) refer to a prosocial consumer as someone who cares about society and tries to maximize his or her beneficial impact on society while minimizing any harmful effects that may be caused during the consumption cycle. Mohr et al. (2001) further suggest that prosocial consumers may also evaluate a company’s efforts in corporate social responsibility before purchasing its products or services. Taking it even further, Russell et al. (2016) found that prosocial consumers are willing to engage in both individual and collective actions aiming at penalizing companies for being involved in environmentally irresponsible activities. To sum it up, prosocial consumers tend to focus on buying from companies which help society while avoiding spending money on products from companies which damage society (Mohr et al., 2001).

3.2 Drivers of Prosocial Consumer Behavior

For a deeper insight into why consumers behave prosocially, this section is dedicated to the exploration of the drivers and motivators of prosocial consumer behavior. Knowledge of the factors at play in this context helps greatly in the further promotion of such behaviors among consumers.

Research has found that there are many reasons why people may act in a prosocial manner. According to Small & Cryder (2016), consumers are motivated to behave prosocially through a variety of motives including extrinsic rewards, reputational benefits, the pursuit of pleasure, and the avoidance of distress.

In line with this, White et al. (2019a) have developed the SHIFT framework which comprises five psychological drivers of behavior change, namely social influence, habit formation,
the individual self, feelings and cognitions, and tangibility. It was originally established in the context of sustainable consumption, which we will further discuss and cover in more depth in the next chapter. Even more recently, White et al. (2020) have applied this very same framework to prosocial consumer behavior too and show that its factors also lend themselves very well to explain how consumers may be influenced and motivated to change toward more prosocial behaviors. In the following, the academic work by White et al. (2020) will be reviewed in more detail, explaining the five SHIFT factors in relation to their power to promote prosocial behavior.

**Social Influence.** It is indubitable that people care about what others think or believe about them. Expectations, behaviors, and the simple presence of others influence people on many different levels, also in their role as consumers (White et al., 2020). This is why social influence is a psychological factor that affects consumers when making prosocial decisions. According to White & Peloza (2009), the more observable or public a specific action is, the more consumers will act in a prosocial way such as giving to charity or buying sustainable products. To support this contention, their finding shows that people donate more money to charity when they are observed by others. Additionally, the more people donate to charity, the more the initiative is recognized as a good cause which in turn, incentivizes even more people to donate as well. So, generally, social observability tends to increase prosocial actions. However, if the motives behind the prosocial action are of self-serving nature, such as to improve one’s public image or gain publicity, and observing individuals are aware of that, the prosocial action does not have the desired image improving outcome but rather leads to the opposite effect (Newman & Cain, 2014; Barasch et al., 2016). According to the researchers, people will instead react negatively and doubt the agent’s moral character and sincerity.

Moreover, according to the SHIFT framework, social norms also influence prosocial actions. All these behaviors such as donating blood, volunteering, or sustainable consumption have become established norms, and therefore increase individuals’ intentions to behave prosocially (White et al., 2020). According to Shang & Croson (2009), when consumers believe that others give more when donating, they donate more themselves to adjust to the others’ donations. In the same way, when consumers learn that others donate less than they anticipated, they may adjust their own donation and reduce it to match the social norm (Jung et al., 2014). Social norms serve
here as an effective indicator of appropriate giving levels (Small & Cryder, 2016). Further, the likelihood of an individual to behave prosocially is even higher when such social norms and behavioral standards are determined by an ingroup which this individual belongs to as opposed to a social outgroup. This is because social group membership allows individuals to share a social identity with others and their prosocial behaviors are reinforced within their ingroup via a motivating focus on the collective self (White et al., 2020).

**Habit Formation.** Some prosocial behaviors, such as blood donation, can be habitual in nature and they can contribute to the establishment of certain future responsibility and commitment to continue with it (Ferguson, 1996). Habits are learnt behavioral responses “that persist because they have become relatively automatic over time as a result of regularly encountered contextual cues” (White et al., 2019a, p. 25). Moreover, there are external tools which can help individuals establish a prosocial action as a habit, for example, making the performance of the behavior as easy as possible. It has been found that the less effort an action requires, the more people are willing to engage in it. Some researchers discovered how reducing the distance to blood donation centers or asking for donations at the checkout cashiers increases the amount of people performing the prosocial action (Olaiya et al., 2004; Kelting et al., 2019). Moreover, incentives and punishment also play an important role in guiding people’s behaviors. According to several authors, incentives and rewards increase the probability of prosocial actions to become habits, whereas punishments discourage non-prosocial actions (Clotfelter, 1980; Gilbert, 2005).

**Individual Self.** Apart from social and habitual influences, it is quite important to be aware that individual factors can also predict prosocial behaviors. In this area, self-concept, self-interest, and self-perception are the main influencing factors (White et al., 2020). Regarding self-concept, it can be said that individuals who want to keep and maintain a positive view of themselves and improve their moral self-worth may reinforce these by increasing their prosocial activities such as blood donation or volunteering (Froming et al., 1998; Sachdeva et al., 2009). Sometimes prosocial behaviors are particularly performed after a negative action in order to compensate and morally clean one’s own self-concept (White et al., 2020). Moreover, following the reverse logic, it has been observed that after performing a prosocial action, individuals may carry out negative, more self-serving actions because they feel the right to do so justified by their past ethical behaviors.
Individuals also look for emotional benefits for the self which make them feel better about themselves after helping someone or feel worse after seeing someone in need (Barasch et al., 2014).

When it comes to **self-interest**, research has found that the more an individual is focused on the self and their own resources, the smaller is their likelihood of performing prosocial actions (Levontin et al., 2015). Moreover, when individuals have low public self-consciousness, that is, they care very little about normative expectations and about how their behaviors are evaluated by others, they tend to prefer self-benefits over other-benefits and consequently show decreased altruistic behavioral intentions (White & Peloza, 2009). Further demonstrating an underlying focus on self-interest, Ariely et al. (2009) conclude that people are more likely to make private prosocial decisions when they are financially incentivized. Moreover, higher generosity levels measured as the frequency of favor exchange at the workplace have been linked to higher social status and better reputation and may thus often be motivated by self-interest (Flynn, 2003).

However, sometimes **self-perception** can make individuals behave less generously when they believe that their own goodness can only be proven and increased via pure and altruistic motivations instead of extrinsic ones (Small & Cryder, 2016). This is due to the effect known as “crowding out” of intrinsic motivation which has been detected across several prosocial behavior experiments (Small & Cryder, 2016). According to Heyman & Ariely (2004), the effect of “crowding out” occurs when what was an act of donation and caring becomes an action performed in exchange for a payment. This way, the meaning of the action changes and with this the reason why people engage in it. Thus, the crowding out of intrinsic motivation effect reduces individuals’ engagement in prosocial behaviors when they are compensated with extrinsic incentives (Small & Cryder, 2016). The same effect can also influence consumers when performing prosocial actions in public. Contrary to what was analyzed in the social influence section, when focusing on the perception of self, some experimental studies found that the participants’ level of generosity is reduced when they perform an action in front of a public audience. The logic here is that individuals often want to prove their own good and kind heart to themselves when acting generously but by receiving reputational benefits from observers their intrinsic motivations are compromised and lose their moral value (Gneezy et al., 2010; Gneezy et al., 2012a). On top of that, research has also
found that when prosocial actions require some effort and may cause pain, like blood donation, individuals are more willing to perform them due to the self-sacrifice and extra meaning which can potentially be a boost for their self-perception (Olivola & Shafir, 2013).

**Feelings and Cognitions.** As outlined before, emotional benefits gained for the self can influence and drive an individual’s prosocial actions. And clearly, there is no doubt that individuals generally make their decisions based on cognitive and affective criteria. This is why feelings and cognitions can also be considered as drivers of prosocial behaviors. According to research, both positive and negative emotions and moods can lead to prosocial actions. In the case of positive emotions, positive affective states have been found to increase the willingness of people to help others and to act prosocially. Also, the idea of spending money on others and donating time can activate a more emotional mindset in individuals and they experience more positive affective states such as happiness (Liu & Aaker, 2008; Dunn et al., 2008). According to Cavanaugh et al. (2015), positive emotions such as hope, pride, love, and compassion influence people to act prosocially toward close entities. However, they found that only love has the power to induce prosocial behavior toward global organizations and distant others (Cavanaugh et al., 2015). On the other hand, negative emotions can also influence the performance of prosocial actions. According to Cialdini et al. (1987), the desire to resolve or repair negative emotional states may drive an individual to engage in prosocial behaviors. Also, research suggests that when people experience the emotion of guilt, they are more predisposed to carry out prosocial actions (Basil et al., 2008).

Furthermore, it is relevant to highlight here how empathy is related to prosocial behavior. Empathy can be defined as “the ability to take another’s perspective and experience resulting thoughts and feelings” (Birnie et al., 2010, p. 360). Considering this definition, empathy encompasses both an emotional and a cognitive dimension. Emotional empathy involves the emotional responses, like emotional contagion and interpersonal concern, that cause the prosocial helping behavior. On the other hand, the cognitive empathy dimension is related to the capacity to accurately imagine other people’s intentions, thoughts, and viewpoints. Small & Cryder (2016) found that individuals may be influenced by empathy when acting prosocially. Some other researchers support this contention by relating empathy to the ability to feel warmth, concern, and compassion for others (White et al., 2020). Hence, empathy also appears to be a very relevant driver
of prosocial actions (Eisenberg & Miller, 1987). Further related to the impact of cognitions, research suggests that cognitive aspects such as aesthetically pleasant images or perceived good memory for details about a charity initiative can also positively influence the performance of prosocial actions (Cryder et al., 2017; Smith & Schwarz, 2012).

**Tangibility.** Often prosocial actions seem to be rather vague, uncertain, and distant from the self. This is the reason why tangibility becomes an important driver of prosocial behavior. According to Small & Cryder (2016), donors may feel pleasure because their generosity has led to a tangible impact. Moreover, White et al. (2020) found that when the beneficiaries of an action, that is, the victims, are identified, individuals feel more attracted by the prosocial activity of giving to charity. In this context, Kogut & Ritov (2005) found in their experiments that when the single victim was identified, the cause received considerably more contributions than the non-identified single victim. Small & Loewenstein (2003) support these findings by demonstrating that even a weak form of identifiability increases others’ caring.

Moreover, actively communicating the impact that an individual’s action will have on the cause may increase the overall number of individuals supporting the prosocial action, for example, stating that per dollar donated three people’s lives will be saved (Sharma & Morwitz, 2016). Tangibility can also be increased through self-efficacy, that is, the feeling that one’s actions are meaningful and can make a difference (White et al., 2020). And in turn, perceived self-efficacy fosters prosocial actions carried out by individuals (Grant & Gino, 2010). Therefore, research suggests that higher tangibility also leads to an increase in prosocial behaviors.

### 3.3 Effects of Mindfulness on Prosocial Behavior

In this section, the relation between mindfulness and prosocial behavior is analyzed. As shown in the first chapter, research confirms that many benefits can be associated with the practice of mindfulness such as stress relief or emotion regulation (Glomb et al., 2011; Kabat-Zinn, 2003). More recent empirical evidence has also established a positive effect of mindfulness on the development of prosocial behaviors in individuals.
According to Davidson & Harrington (2002), mindfulness fosters individuals’ ability to naturally connect to other people. This may be driven by the power of mindfulness to help individuals focus their attention on the present moment and increase their situational awareness of their physical environment and the people around them instead of being too involved in their self-concerns (Kabat-Zinn, 2003; Good et al., 2016). Consequently, mindful individuals are better able to recognize and respond to others’ needs and attitudes as they occur and therefore, are enabled to have more successful communications with the people around them (Hafenbrack et al., 2020; Bavelas et al., 2000). According to Brown & Ryan (2003), disengaging from automatic thoughts through mindfulness further helps individuals hold a more perceptive attitude when listening to others’ ideas and thoughts. Hence, more mindful people are less influenced by assumptions, biases, and judgments and in turn, they are more accepting and tolerant toward others (Hafenbrack et al., 2020). Moreover, emotional self-regulation, which is also one of the benefits cultivated through the practice of mindfulness, may be another pathway to enhanced prosocial behavior. According to the results of their concurrent and longitudinal study focused on prosocial behaviors in adolescents, Carlo et al. (2012) found that self-regulation was consistently and positively related to the participants’ prosocial competences displayed at home and among their peers. All this academic work supports the notion that mindfulness can help individuals behave in a better manner toward others, treat them better, and be more tolerant. Consequently, it is assumed that there is a positive link between mindfulness and individuals’ engagement in prosocial behaviors.

In fact, several studies to date have directly investigated the relation between mindfulness and prosocial behavior in different contexts. First, Hafenbrack et al. (2020) examined the effect of state mindfulness on prosocial behavior in the work environment. In their experiment, employees were instructed to do a five-day morning meditation practice and their resulting engagement in prosocial behaviors was measured. The findings of this experiment show increased helping behaviors and other-focused orientation in workers who carried out the mindfulness practice compared to those in the control group. Further, Donald et al. (2019) conducted a systematic literature review and ran a meta-analysis of 31 eligible empirical studies on the link between mindfulness and prosocial behavior to examine whether the benefits which an individual receives
through mindfulness also extend to others. In fact, they found positive pooled effects supporting their hypothesis that helping behaviors can be increased through mindfulness interventions.

*Prosocial-Behavior-Enhancing Mechanisms of Mindfulness*

As can be seen, research supports the existence of a positive correlation between mindfulness and prosocial behavior. For a more detailed insight however, it is necessary to analyze the different mechanisms that provide potential explanations for this relationship: self-regulation, compassion, empathy, and resourcefulness.

**Self-regulation.** Research shows that mindfulness also increases self-regulation (Glomb et al., 2011; Hart et al., 2013). According to some studies, more mindful people treat others in a better and less aggressive way than mindless people do (Liang et al., 2018; Long & Christian, 2015; Krishnakumar & Robinson, 2015). Therefore, mindfulness is negatively related to aggressive behaviors toward others. Moreover, Donald et al. (2016) studied how present-moment awareness during a stressful day affects individuals’ responses to stress. It was found that higher awareness in the present moment enhances adaptive stress responses, that is, individuals are more capable of regulating their personal distress and, in turn, they are more likely to act with kindness and warmth toward others (Donald et al., 2016). Furthermore, Viglas & Perlman (2018) studied the effect of mindfulness on young children in a classroom environment and found that the mindfulness group showed to be more prosocial, with greater improvement in self-regulation and less hyperactivity than the children in the control group.

**Compassion.** According to Weng et al. (2013, p. 1171), compassion is “a key motivator of altruistic behavior.” Research has found a positive correlation between mindfulness and prosocial behavior through compassion in various experiments. For example, Weng et al. (2013) studied how meditative compassion training can influence individuals to behave in a more altruistic way. The authors used a meditation intervention to increase people’s level of compassion and evaluated how prosocially the participants acted afterwards. The results show that people in the meditation group were able to better understand the suffering of others, suggesting that the meditation exercise increased people’s altruistic behaviors through their increased level of compassion. Another study
which analyzed how meditative mindfulness can increase compassionate responses to suffering was conducted by Condon et al. (2013). They used an 8-week meditation program to test how this might influence the participants’ helping behaviors when they see other people suffering. The results show that participants of the meditation program were more than five times more likely to help others ease their pain than the control group.

In addition, Lim et al. (2015) also found that mindfulness enhances compassion. They analyzed whether individuals who engaged in a mobile-app-based meditation training for three weeks become more compassionate and more willing to help others in need. Confirming their hypothesis, the results of their experiment show greater compassion and helping behaviors for those who participated in the meditation training compared to the active control group. In line with this, Ashar et al. (2016) analyzed the effect of compassion on societal well-being through meditation. They investigated how compassion meditation can influence donations to charity. It was found that relative to control conditions, the meditation practice increases the level of compassion which, in turn, leads to an increase in the amount of money donated to charity. Another experiment on the effect of compassion meditation on prosocial behavior was run by Leiberg et al. (2011). For this, the authors developed a new prosocial task, the Zurich Prosocial Game, to measure individuals’ level of prosociality in the form of helping behavior toward strangers. The findings show that the control group, which received a non-meditative memory training, behaved less prosocially than the compassion meditation group.

**Empathy.** Another pathway through which mindfulness may positively influence prosocial behavior is empathy (Berry et al., 2018). More mindful individuals have shown to develop better affective and cognitive empathic abilities (Beitel et al., 2005). This finding is further supported by research which implemented the MBSR program and equally reported that participants engaging in the mindfulness intervention showed greater ability to put themselves into other people’s shoes and share their perspectives (Birnie et al., 2010). In the context of prosocial behavior, Berry et al. (2018) analyzed prosocial responsiveness when people do a brief meditative mindfulness exercise. In their studies, the authors found that individuals in the control group show less prosocial responses to ostracized strangers than individuals in the mindfulness intervention group. Moreover, they found that meditating individuals report higher empathic concern for those strangers. Hence,
empathy appears to mediate the relation between mindfulness and helping behaviors (Berry et al., 2018). However, other research exists which does not align with these findings. From the results of an experimental study in which participants had to listen to a 5-minute meditation exercise and complete a mind-reading task, the research team around Ridderinkhof et al. (2017) unexpectedly had to conclude that meditation does not increase the levels of empathic responding or prosocial behaviors.

**Resourcefulness.** As discussed previously, Orazi et al. (2021) carried out a few studies applying state mindfulness and found that mindfulness positively influences other-focused behaviors. They showed that resourcefulness, the perception that one is abundant in personal resources, acts as a mediator between mindfulness and other-focused behaviors like volunteering, charitable donations, and choice of fair-trade products. The results suggest that more mindful people feel that they have more resources to spare, and this motivates them to engage in more prosocial behaviors (Orazi et al., 2021).

While all four mechanisms of mindfulness addressed herein have shown to have positive effects on prosociality as reported by different studies, there is so far, to the best of our knowledge, only one publication which put forth empirical evidence for the mediating role of resourcefulness in the relationship between mindfulness and prosocial behavior (Orazi et al., 2021). Motivated by this still relatively unresearched area in the literature, we strive to add to the current state of knowledge on this particular mechanism by focusing on and investigating further the potential of the resourcefulness construct within our study.

4. **Sustainable Consumption**

The final chapter of the theoretical background is dedicated to a deeper discussion of sustainable consumption. After defining and demonstrating the global importance of this specific behavior, theoretical models and conceptualizations of (sustainable) consumer behavior are applied to better understand the inner workings of what it means to consume sustainably. Lastly, the drivers which promote engagement in sustainable consumption are explored with a focus on reviewing extant research on the power of mindfulness to enhance sustainable consumption lifestyles.
4.1 Definition and Relevance in Research and Practice

Today’s world has developed into a place in which consumption appears to rule every aspect of life. Whether it is for comfort, convenience, the satisfaction of needs (actual and alleged), or the construction of one’s self-identity and its communication to others – consumption seems to solve them all (Lim, 2017). However, the world is also facing the alarming flipside of this development. Modern consumerism and the rapid growth in hyper-consumption are simply not ecologically sustainable in the long term and cause irreversible environmental damage which seriously threatens the future and well-being of both people and the planet (Sheth et al., 2011; Lorek & Vergragt, 2015; Lim, 2017).

Bringing about change and working toward more sustainable development is a tremendous challenge that requires the commitment and active contribution of consumers, businesses, policy makers, and researchers alike. Lorek & Vergragt (2015, p. 21) call this a systemic change which “encompasses simultaneous changes in culture, production processes, consumption patterns, lifestyles, economics and politics.” For this reason, sustainable consumption is a highly complex and interdisciplinary concept which is not only extensively researched within consumer behavior, business ethics, psychology, environmental economics, and sustainability but also in many other fields of contemporary research (Reisch & Thøgersen, 2015). Since it received initial attention in research in the early 1990s, the topic has evolved into a global megatrend and despite three decades of academic insight, the research field around sustainable consumption is still in its infancy (Reisch & Thøgersen, 2015).

It is vital to enter an integrated dialogue and to rewrite the story about the nature of prosperity (Michaelis, 2003). Although the business community and governments are playing essential roles in providing the general conditions and opportunities for a transformational shift toward a culture of sustainable living to come about, the individual consumer can be regarded as pioneering change agent in this context. Empowered mainly by technological advancements, today’s consumers have taken on a considerable amount of control over market dynamics, they drive production and set lifestyle trends through their demands and their voices as active co-creators of the market (Labrecque et al., 2013). Thus, it becomes evident that civil society can
actively demand and promote sustainable development through, first and foremost, their engagement in sustainable consumption (Michaelis, 2003).

At the 1994 Oslo Roundtable, a working definition was put forth which identifies sustainable consumption as “the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations” (Lorek & Vergragt, p. 19). Put more precisely and taking on a holistic approach to consumption, Phipps et al. (2013, p. 1227) define sustainable consumption as “consumption that simultaneously optimizes the environmental, social, and economic consequences of acquisition, use and disposition in order to meet the needs of both current and future generations.”

Addressing both the concept of prosocial behavior and sustainable consumption within this project, it is crucial to differentiate the two from each other and place them into distinct positions in our conceptual model. However, it simultaneously needs to be acknowledged that the constructs are to some extent interrelated and therefore only allow for a somewhat overlapping differentiation.

Kollmuss & Agyeman (2002, p. 240) define pro-environmental behavior as behavior which “consciously seeks to minimize the negative impact of one’s actions on the natural and built world.” Compared to the outlined definitions of sustainable consumption, it is assumed that when primarily focused on the environmental consequences, sustainable consumption can be considered a form of pro-environmental behavior. Further, an encyclopedia of sustainability reports a “convergence among authors that pro-environmental behaviors represent a special case of prosocial behavior because they also imply that people may benefit others even while there are often no direct individual benefits received for engaging in these behaviors” (Paço, 2019, p. 1322). In conclusion, sustainable consumption may class as a form of prosocial behavior, which makes the overlap between the two constructs immediately obvious. Further elaboration upon how we propose to deal with this conceptual overlap within this research project will follow in the fifth chapter.
The Dilemma of the Sustainable Attitude-Behavior Gap

Having established the pivotal role that consumers play in the promotion of sustainable development, it appears as an even bigger dilemma that, despite the consumers’ general concern for the environment being rather strong nowadays, many individuals yet admit that their attitudinal environmental commitment not always manifests itself in their actual behavior (Young et al., 2010; Kollmuss & Agyeman, 2002; White et al., 2019b). Although especially millennials, who have a tremendous spending power as the currently largest living adult generation, show a heightened preference for purpose-driven and sustainable brands, a recent consumer survey revealed that while 65% are committed to buy from such ecologically conscious brands, only 26% actually put their attitude into sustainable practice (White et al., 2019b; Netzer, 2020).

In fact, many consumers are so caught up in their natural tendency for heuristic-based decision-making and their well-established routines and habits shaped by social norms and standards making it almost impossible to bridge the so prevalent attitude-behavior gap in the context of sustainable consumption (Verplanken & Roy, 2015; Fischer et al., 2017).

In an effort to tackle this dilemma and to reduce the discrepancy between consumers’ sustainable attitudes and behaviors, it is crucial to first understand the nature and dynamics of this phenomenon. Quite a lot of empirical insights gained within the field of consumer behavior and decision-making as well as consumer psychology lend itself to a deeper understanding of the attitude-behavior gap which prevents consumers from adopting more sustainable lifestyles (Verplanken & Roy, 2015). However, it should also be noted that the following theoretical insights are only parts of a much more complex reality in which sustainable consumption is embedded in.

In the consumer decision-making literature, a lot of academic work on cognitive processes can provide plausible explanations as to why unsustainable choices are made. In dual process theory, two thinking systems are differentiated (Kahneman et al., 1982). While some decisions may be derived from a very deliberate, conscious, and cognitively demanding mental process (System 2), other decisions are made based on quite automatic, unconscious, and mentally less effortful processes (System 1). Which of the two systems prevails in any given situation, is mostly
determined by an individual’s current level of motivation and cognitive capacity to process information. Due to the inherently limited human brain capacity combined with the constant exposure to information overload, people tend to make extensive use of the faster and less reflective System 1 to manage their daily (consumption) decisions and free up mental space for other, more complex tasks (Verplanken & Roy, 2015).

Within System 1, they can for example refer to heuristic-based decision rules to support their decision-making in a fast and effortless way. As mental shortcuts, heuristics include the satisficing, elimination-by-aspect, and lexicographic decision rule. Unlike the rational decision rule in which an individual considers all available choice alternatives, calculates a weighted value of all important attributes per each alternative, and then chooses the option with the highest value, the above-mentioned heuristic-based rules either assess only a few of the available options and/or refer to the most important attribute only while fully ignoring other attributes (Verplanken & Roy, 2015). Hence, unless sustainability is a top priority and deeply embedded in an individual’s personal values, it is possible that it will not be considered at all in most of the heuristic-based consumption decisions made by consumers who, for example, have higher values for other factors like quality, price, or comfort (Verplanken & Roy, 2015). It is still relatively rare that sustainability is an integrated part of an individual’s self-concept. Coupled with the heuristic nature of most decisions, it becomes evident why so many people do not behave sustainably.

Another implicit process associated with System 1 and prevalent in most decisions made in consumption contexts is the power of habit. As introduced before in relation to prosocial behavior, habits can ease cognitive load and help people make fast decisions while simultaneously freeing up mental resources.

On the flipside however, they represent a huge barrier to sustainable development. Research has shown that habits can trigger tunnel vision and perceptual biases that lead people to ignore new and relevant information (Verplanken et al., 1997). At the same time, when engaging in habitual behavior, individuals somewhat give up their control and willpower and let external cues trigger their responses instead. When habits are strong, even intentions appear to lose their guiding influence on behavior. In the context of sustainability, this means, when people have well-
established habits featuring unsustainable behaviors, even their strong attitudinal environmental commitment may not suffice to induce behavioral change (Verplanken & Roy, 2015). The sustainability argument will simply be neglected when habituation takes over and makes an individual choose without much conscious deliberation. Making an effort to break old habits is a challenging but crucial endeavor in promoting sustainable development and will be further discussed later on in this chapter.

Research in evolutionary consumer psychology also provides some potential explanations for the phenomenon that people have strong concerns, yet they do not act on issues of sustainability such as the climate crisis or environmental pollution. First, this could be due to the human tendency of temporal discounting, that is, people overvalue rewards received in the short-term relative to long-term benefits (e.g., Green et al., 1994). When it comes to sustainable development, today’s responsible choices usually do not provide instant gratification and thus, they require a considerable amount of self-regulation to be favored over competing motivations (Antonetti & Maklan, 2014). More often than not, people find themselves in a trade-off situation between receiving rewards in the short- or long-term and their human nature makes them prefer the former.

Another explanation can be found in construal level theory (Trope & Liberman, 2010). It describes the relationship between the perceived psychological distance and the extent to which people’s cognitive thinking is abstract or concrete. Many sustainability-related problems like climate change, environmental pollution, or deforestation and especially their consequences are quite abstract and not directly felt or seen by most people. Therefore, the psychological distance is often too large to encourage consumers to change their behavior and to act more sustainably.

Keeping these psychological mechanisms in mind which have the power to hold consumers captive in the attitude-behavior gap, it is just as relevant to also consult general theoretical models of consumer behavior in the context of sustainable consumption because they cannot only provide further insight into potentially gap-widening factors but also help more accurately predict and ultimately promote pro-environmental behavior (Stern, 2000; Phipps et al., 2013).
4.2 Theoretical Models of (Sustainable) Consumer Behavior

To develop a better understanding of the factors impacting sustainable consumption, researchers have explored and applied some existing theoretical models that also help explain the motivating drivers of consumer behavior in other non-sustainability-related contexts.

The Values-Beliefs-Norms (VBN) model of environmentalism by Stern (2000) suggests that prosocial beliefs and personal moral norms mediate the relationship between people’s personal values and their pro-environmental behaviors. People build their own prosocial and environmental beliefs rooted in a very personal set of altruistic, biospheric, and egoistic values. For every individual, the focus on either of those three general value orientations may vary and can also underlie cultural influences (Steg et al., 2005; Cho et al., 2013). Based on those beliefs, people further develop personal norms which include a moral sense of obligation and responsibility to act sustainably. Moral norms are activated within an individual if they believe that acting against them would be detrimental to environmental conditions and adversely affect anything related to their personal values (Stern, 2000; Steg et al., 2005). Consequently, an individual’s engagement in pro-environmental behaviors can be significantly predicted by their prosocial beliefs and personal norms. If an individual holds strong prosocial beliefs shaped by altruistic and biospheric values, coupled with an internalized sense of personal obligation to act sustainably based on moral norms, they are much more likely to commit to sustainable development and engage in pro-environmental behaviors (Stern, 2000).

Building on the VBN theory, Ölander & Thøgersen (1995) developed the Motivation-Abilities-Opportunities (MAO) model to take even more factors into consideration which could predict consumer behavior. Motivation reflects the components of the VBN model and includes the intentions which are formed based on social norms and attitudes. However, Ölander & Thøgersen (1995) posit that for motivation to manifest itself in behavior, individuals also require both the ability and opportunity to perform such actions. Ability is further determined by task knowledge and habits. While task knowledge entails an individual’s skills and cognitive task-related capabilities, habits are regularly and quite automatically performed behaviors. Both elements represent resource constraints like time pressure, financial status, or limited thinking
capacity which moderate the intention-behavior-link (Thøgersen, 2005). Lastly, opportunity is the third component of the MAO model which represents any external, situational condition that could either facilitate or pose a structural constraint on the performance of a specific behavior (Ölander & Thøgersen, 1995). In the context of sustainability, these conditions can take the form of availability or lack of sustainable options, appropriate infrastructure and facilities, as well as the clear labelling of sustainable products. Moreover, policy makers, businesses, and culture play dominant roles in providing consumers with the opportunity to act ecologically conscious (Thøgersen, 2005).

Combining the elements of the MAO model and applying them to sustainable consumption, it can be predicted that an individual’s intention to engage in sustainable consumption is more likely to manifest itself in actual behavior when the individual is equipped with the required abilities and favorable external opportunities to successfully perform the task (Ölander & Thøgersen, 1995).

More recently, Phipps et al. (2013) moved toward a new and more advanced theoretical understanding of sustainable consumer behavior by adding the concept of reciprocal determinism from social cognitive theory to the basic idea of the hitherto existing models. They suggest a less linear and more interactive and dynamic framework, in which behavior is not only an outcome but a determining variable embedded in a feedback loop based on the logic of reciprocal determinism (see Figure 1). According to this concept, past behavior can influence both personal and environmental factors, and in turn, inform future actions due to triadic reciprocal causation (Bandura, 1986). Personal factors include values and beliefs of self-efficacy and competence, while environmental factors refer to social and situational conditions. Hence, consumers use the tangible outcomes like economic benefits and their feelings arising from past behaviors as feedback to inform and adapt their future behaviors as well as personal and environmental factors (Phipps et al., 2013).

Following the dynamics of reciprocal determinism in the sustainability context, consumers can learn from and overcome situational constraints and they may use their experience and feelings from past behaviors to adjust their personal beliefs and mindset. As a result, their future actions are
influenced by their past behavior as well as shaped by their adapted personal and environmental factors. However, it is important to note that the interdependency of these three factors can be positive or negative. This means, that sometimes reciprocal determinism can also impede sustainable development by for example triggering unfavorable licensing effects whereby consumers use their past ecologically conscious behaviors as a justification for less sustainable actions later on (Phipps et al., 2013).

![Social cognitive theory framework and reciprocal determinism (Phipps et al., 2013).](image)

**Figure 1**: Social cognitive theory framework and reciprocal determinism (Phipps et al., 2013).

Especially in the support of the endeavors to promote sustainable behavioral change, it is crucial to integrate and consider the power of feedback in consumer behavior. Therefore, going forward in research and practice, it is highly recommended to regard the existing models as complementary views and to take on the nuanced perspective proposed by Phipps et al. (2013) to fully capture and explain the nature and dynamics of sustainable consumption.

### 4.3 Theoretical Conceptualization of Sustainable Consumption

In an attempt to holistically conceptualize the notion of sustainable consumption, Lim (2017) presents an integrated theoretical model to sustainable consumption which includes the three theoretical perspectives of mindful consumption, responsible consumption, and anti-consumption – all of which help elucidate how consumers practice sustainable consumption and how this behavior is facilitated (see Figure 2). The integrated model posits that consumers engage in sustainable consumption when they successfully express their sustainability mindset in sustainability practices.
Theoretically derived from mindful and responsible consumption, the sustainability mindset involves a sense of care toward the self, the community, and nature which in turn activates an internally acknowledged sense of ethical, social, and environmental responsibility. Approaching consumption decisions within this mindset predisposes consumers to act in a more sustainable and tempered manner by expressing their attitude through aversion of unsustainable consumption practices and by regulating their behavior through the avoidance or abandonment of unsustainable consumer behavior which can take the form of rejection, restriction, or reclamation (Lim, 2017).

Figure 2: Integrated theoretical approach to sustainable consumption (Lim, 2017).

With this conceptual model, Lim (2017) provides a deeper understanding of the drivers which motivate consumers to engage in sustainable consumption. This integrated theoretical perspective bears great potential in so far as these drivers can serve as a starting point to develop effective interventions which promote more sustainable mindsets, consumption patterns, and lifestyles among consumers and societies at large.

Especially in the context of the sustainability mindset, many scholars agree that the understanding of consumer beliefs about the effectiveness of their own actions and the impact of those beliefs on actual consumer behavior is one of the key issues of sustainability research (Phipps et al., 2013; Reisch & Thøgersen, 2015).
4.4 Drivers of Sustainable Consumption

Social perception is of fundamental importance in the context of sustainable consumption due to its power to influence human judgment, decision-making, and actual behavior (Leary et al., 2014). Consumers need to feel empowered to make an actual difference and contribution to change in order to translate their sustainable attitudes and intentions into real behavior. Researchers have found several drivers and antecedents impacting this feeling of empowerment which in turn promotes sustainable consumption behaviors (Leary et al., 2014; Kim & Choi, 2005; Cho et al., 2013; Antonetti & Maklan, 2014; Roberts, 1996).

First, perceived consumer effectiveness (PCE) has been identified as a crucial driver of sustainable consumption by many researchers and can be understood as a cognitive variable which determines individuals’ beliefs in their ability to contribute to the solution to sustainability issues and influence the environment (Ellen et al. 1991; Roberts, 1996; Kim & Choi, 2005; Cho et al., 2013). Hence, the active commitment to and engagement in sustainability practices strongly depends on whether people are confident that their individual actions make a difference in driving sustainable development (Kim & Choi, 2005).

The variable of PCE is not fundamentally new and shares a lot of similarity with some established and well-known theoretical concepts in consumer behavior. It can be associated both with the concept of self-efficacy in social learning theory (Bandura, 1986) and with perceived behavioral control which is a key construct in the theory of planned behavior (Ajzen, 1991). However, while those two concepts relate more to the perceived personal ability to engage in a behavior per se, PCE is rather focused on the perceived personal ability to impact relevant outcomes by behaving in a certain way. Conceptually more closely related to the notion of PCE, Cleveland et al. (2012) have put forth a measure of internal environmental locus of control which captures consumers’ perception of their ability to influence sustainability outcomes through pro-environmental behavior.
In the context of sustainability research, PCE appeared to exceed demographic and psychographic variables in their power to predict environmentally conscious behavior (Roberts, 1996) and has therefore received considerable scholarly attention in recent years.

Cho et al. (2013) have found that cultural orientation can significantly influence consumers’ decision-making processes and the level of PCE. While their study has revealed that vertical individualism has a negative impact, horizontal collectivism positively affects PCE. Vertical individualists especially value independence from others, they focus on personal goals, and tend to acquire social status by competing with each other. In contrast, horizontal collectivists usually live within cultural contexts characterized by cooperation, interdependence, and the prioritization of the well-being of the group over that of the individual self while still pursuing personal goals as well (Cho et al., 2013; Hofstede, 1980). The authors conclude that, as opposed to individualists, collectivists feel a stronger obligation toward the larger community and the environment and thus, are more inclined to make more future- and group-oriented consumption decisions, reflecting the very nature of sustainable consumption behavior.

Moreover, a higher PCE has been found to have a positive effect on environmental attitude which then further manifests itself in higher pro-environmental commitment. These findings are somewhat in line with earlier empirical work by Kim & Choi (2005), who showed that people with a more collectivistic value orientation score higher on PCE. However, in this study, higher PCE was directly related to increased green purchase behavior. The attitudinal variable of environmental concern showed to have a direct positive influence on green purchase behavior as well but a relation to an individual’s collectivistic tendencies could not be established. This means, people who are already environmentally concerned are more likely to make green choices independent from their general value orientation (Kim & Choi, 2005).

Advancing research on PCE, Antonetti & Maklan (2014) investigated how feelings of guilt and pride resulting from one single act of consumption can increase sustainable consumption choices through their impact on PCE. From a psychological stance, experiencing self-conscious emotions like guilt and pride reinforces the individual’s sense of personal agency making them feel directly responsible for bringing about positive or negative consequences through their individual
consumption decisions (Baumeister et al., 2007). The cognitive information contained in these emotions serves as indirect feedback of past behavior and triggers a self-regulating learning process within individuals which then guides the assessment of future consumption decisions. In this way, feelings of guilt and pride effectively prevent consumers from applying neutralization techniques, often used by individuals to rationalize their attitude-behavior gaps, and they learn that sustainability outcomes are in fact determined by their individual consumption behavior. As a result, PCE will increase which positively influences sustainable purchase intentions (Antonetti & Maklan, 2014). This empirical evidence is especially valuable and makes the role of emotional experiences in this context even more crucial because other recent research has found that merely providing consumers with factual information and knowledge about sustainability does not have a significant impact on PCE (Vermeir & Verbeke, 2006; Hanss & Böhm, 2013).

Besides PCE, Leary et al. (2014) introduce perceived marketplace influence (PMI) as another crucial driver of sustainable consumption. PMI is defined as an individual’s belief that their actions are inspiring and actively impacting the behavior of other marketplace actors such as other consumers and organizations (Leary et al., 2014). A high PMI motivates individuals to make more sustainable choices and act on their values. In their study, Leary et al. (2014) investigated the relationship between environmental concern and sustainable consumption behaviors like energy efficiency behavior, eco-conscious buyer behavior, and post-consumption behavior. Their findings indicate that environmental concern is necessary but not sufficient for sustainable consumption behavior to take place. The authors demonstrate that PMI serves as a mediator in this relationship which has the power to transform an individual’s environmental concern into real action. Interestingly, for a positive behavior change to occur, merely the belief that one’s own actions influence the behavior of others is sufficient without requiring evidence of any actual change happening (Leary et al., 2014).

As social beings, consumers usually seek ways to justify and defend their behavior to themselves and others and PMI can in fact offer a justifiable reason for behavioral change. This may even help counteract some of the effects of the previously discussed theories of temporal discounting and psychological distance which offer people supposedly justifiable reasons to stay in their established consumption patterns. However, if people believe that striving toward
sustainability goals encourages others to do the same, it is easier for them to justify their own adapted behavior because by doing so they are contributing to the larger group (Leary et al., 2014). This is also in line with research by Rapert et al. (2010) who confirm that consumers generally have the feeling that it takes the collective effort of many people to make a change.

Promotion of Sustainable Consumer Behavior Change

After defining and conceptualizing the notion of sustainable consumption, drawing on different consumer behavior theories to identify and explain the factors (PCE and PMI) that bear the potential to either promote or impede sustainable decision-making, and discussing the detrimental role of the attitude-behavior gap in sustainable development, it is hardly surprising that many researchers dedicated their work to sustainable consumer behavior change in recent years (White et al., 2019a).

As outlined earlier, consumers play a highly influential role in sustainable development but so do public policy makers and business managers. For sustainable consumer behavior change to occur, all stakeholders must engage in a dialogue and work together toward the same goal. That is, both governments and firms need to adapt their strategies to encourage consumers to act more sustainably and thus, to establish favorable conditions which help reduce the attitude-behavior gap.

Due to the conceptual overlap of prosocial behavior and sustainable consumption, it comes as no surprise that the psychological factors summarized in the previously introduced SHIFT framework can influence both prosocial and sustainable consumer behaviors (White et al., 2019a; White et al., 2020). As mentioned before, White et al. (2019a) have summarized the five SHIFT factors originally in the context of sustainable consumption based on a staggering 280 academic articles from top behavioral marketing and consumer behavior journals. To explain how practitioners and researchers can effectively promote more engagement in sustainable consumption, it is invaluable to briefly touch upon the framework once more from the original lens from which it was first developed.
Drawing on the PMI research and the theoretical models of consumer decision-making, it is evident that social perception and influence are crucial drivers of sustainable consumption. Marketing techniques to promote sustainable consumption in this area could thus be to use messaging that works with descriptive social norms of sustainable behavior, to set up friendly and motivating challenges between competing social groups, or to make sustainable behavior more publicly visible so that consumers can use their engagement for social desirability and status signaling purposes (White et al., 2019a).

As noted earlier, strong and unsustainable habits can be a major obstacle for sustainable consumption. On top of that, most sustainability-related behaviors require repeated and continuous action and thus, they call not only for breaking old habits but also for forming new ones (White et al., 2019a). A few positive habit formation techniques that have shown to encourage behavioral change include prompts reminding consumers of their sustainable choice, extrinsic incentives, feedback on individual performance, and making the sustainable action easier to perform through contextual changes (White et al., 2019a). Moreover, the habit discontinuity hypothesis posits that interventions aiming at sustainable behavior change are most effective when consumers find themselves in major life course transitions such as relocation, childbirth, or entering retirement (Verplanken & Roy, 2015). This is because such life events require consumers to reorganize their routinized lifestyles, habits may be broken or suspended due to the changing situational contexts, and consumers are more receptive to interventions. Schäfer et al. (2012) found that the so-called window of opportunity for changing toward sustainable consumption patterns is quite narrow and interventions are most effective when consumers are exposed to them in the short transition period right before and after the life event. All in all, encouraging consumers to break old habits in favor of a more sustainable lifestyle may not be impossible but the opportunities for intervention are scarce and require precise timing to be effective.

Similar to the findings of PCE research, the individual self and related concepts like self-efficacy should also be continuously reinforced by marketers to shape positive beliefs around PCE. For example, Antonetti & Maklan (2014) suggest marketers to promote sustainable consumption by eliciting positive emotions like pride which has proven to increase consumers’ perception of self-efficacy. Moreover, due to the fact that individuals generally seek to preserve a positive self-
concept and often use their possessions to define their self-identity, marketers should strive to associate sustainable behaviors with positive, desirable, and self-affirming values to make behavioral change more likely (Belk, 1988; White et al., 2019a).

Equally in line with Antonetti & Maklan (2014), feelings and cognitions are highly relevant constructs in sustainable decision-making because they inform consumers’ choices. According to empirical evidence, including either moderate appeals of fear or guilt or triggering positive feelings like pride, joy, or affinity toward nature in promotional campaigns can motivate consumers to behave more sustainably (White et al., 2019a). When it comes to cognitions, providing non-affective information to disseminate general knowledge about environmental issues, related behaviors, and potential consequences is a significant initial step to spur action. However, research claims that factual information does not suffice, and emotional experiences are more powerful especially for long-term sustainable behavioral change (White et al., 2019a; Antonetti & Maklan, 2014).

Lastly and in accordance with the negative impact arising from construal level theory and temporal discounting, tangibility is another psychological route to encourage more sustainable consumption behavior. Because pro-environmental actions and their outcomes often appear abstract, are distant from the self, and do not provide instant gratification, consumers are less likely to adopt sustainable lifestyles. Thus, it is recommended that marketers make sustainability and pro-environmental behaviors more tangible and relevant by reducing consumers’ present-focused biases and encouraging them to focus on their legacy and future generations, by communicating more near-term and local impacts of environmental issues, and by outlining the attractiveness of dematerialized and simplified lifestyles and igniting a desire for intangibles (White et al., 2019a).

It becomes clear from this discussion that there are a variety of psychological factors which can be addressed and externally influenced by marketers and public policy makers to encourage sustainable consumer behavior change. Although the presented techniques may help reduce the attitude-behavior gap to some extent, it is assumed that the mere external stimulation may not suffice to transform the consumers’ mindset which ultimately manifests itself in strongly committed, sustainable consumption patterns. For a more fundamental shift in perspective, looking
inward and cultivating a sense of mindfulness may be a promising alternative route to sustainable development. Hence, the final part of this chapter will explore the relation between mindfulness and sustainable consumption. However, before proceeding to this final part, we show how the concept of mindfulness may be related to and positioned within the SHIFT framework.

*The Relation of Mindfulness to the SHIFT Framework*

Reflecting on the workings of the SHIFT framework in bringing about change in both prosocial and sustainable consumer behaviors, we suggest that mindfulness could advance this framework as an additional, somewhat overarching factor which has an impact on the existing five elements. This superior position of mindfulness may be explained and justified by drawing on several findings from mindfulness research. Recalling chapter one, when practicing mindfulness, individuals cultivate a sustained present-moment awareness and an accepting attitude of non-judgment, non-attachment, and non-reactivity toward inner and outer experiences which they are exposed to in their day-to-day life. Further, mindfulness has shown to improve people’s attentional and emotional self-regulation (Hart et al., 2013). Consequently, these qualities may help mindful individuals to better approach their concept of self and manage their own feelings and cognitions with more self-compassion and non-judgmental acceptance. Coupled with a heightened sense of empathy and social connectedness through mindfulness, people are less likely to act merely out of self-interest or to make them feel or think better about themselves (Birnie et al, 2010; Hutcherson et al., 2008; Aspy & Proeve, 2017). Instead, equally having the well-being of the self and of others at heart becomes second nature to them. Hence, we assume that mindfulness can influence consumers’ choices by making them more resistant to social influences so that they are less likely to act prosocially and sustainably merely motivated by social observability, norms, or status signaling but rather by sincerely held values for moral integrity and social responsibility. Additionally, they become more accepting, free of judgment, and kind toward the individual self and their own feelings and cognitions so that they have higher personal capacities to genuinely care for others and are generally less prone to be guided by self-centered motives at the expense of others. Moreover, through their enhanced awareness of the present moment, mindful people are less likely to act impulsively or out of old habit and routine (Rosenberg, 2004). With this quality, we assume that mindfulness facilitates new habit formation toward more prosocial and
sustainable behaviors because it may be easier for mindful people to become aware of their detrimental routines, disrupt them, and replace them by establishing habits which are better for both themselves and others. Finally, practitioners of mindfulness tend to carry less materialistic values (Geiger et al., 2020). Therefore, they may be less influenced by the typically intangible outcomes of prosocial and sustainable lifestyles. Instead, they will be more easily intrinsically motivated just by the deeper meaning of acting prosocially and sustainably without the need for any tangible rewards or actual and instant gratification.

These reflections show quite clearly how different facets and effects of mindfulness can favorably influence the five SHIFT factors to promote more prosocial and sustainable consumption behaviors. While the authors of the SHIFT framework, White et al. (2019a), have considered the factors as external elements which can be used and targeted by marketers and policy makers to induce behavior change toward more prosociality and sustainable lifestyles, mindfulness is a factor which can only be encouraged by external entities but is ultimately an element that is internally controlled, and it is up to the individual to unfold and make use of its full potential. However, due to its power to influence all SHIFT factors, we suggest including mindfulness as a superordinate element into an advanced version of the currently existing SHIFT framework. Due to the limited scope of this project and in order to substantiate our suggestion, we will not test the whole framework on our research study but include the variable of mindfulness to investigate its potential to induce sustainable decision-making instead.

4.5 Effects of Mindfulness on Sustainable Consumption

Among many other beneficial outcomes, mindfulness has shown to cultivate benevolent values and behaviors toward the self and others and to promote a better alignment between attitudes and behavior which is why this concept is recently picked up at an increasing rate by sustainable consumption researchers who investigate the potential of a positive relationship between mindfulness and sustainable behavior change (Fischer et al., 2017).

Among the first to discuss mindfulness as the antidote to modern consumerism, Rosenberg (2004) explains how the cultivation of mindfulness may help people break out of their habitual,
automatic, and mindless consumption patterns. Through the contemplative practice of mindfulness, people learn to pay more conscious attention to their own experiences and to process external inputs from the environment more carefully. This in turn leads to a heightened awareness of people’s everyday lives and their true needs. Based on this, people are empowered to reduce their susceptibility to manipulative and illusory advertising messages, which are still a widely used sales tactic in modern consumer culture. Instead, they make more conscious consumption choices which are better and more fulfilling for themselves and for the planet (Rosenberg, 2004).

To receive a more integrated, state-of-the-art picture of the emerging research relating mindfulness to sustainable consumption, Fischer et al. (2017) conducted a systematic literature review of primary empirical findings in the field. Two years later, Geiger et al. (2019) advanced this by publishing another literature review evaluating the robustness of the extant empirical evidence on the relationship between mindfulness and sustainable consumption. Drawing from and merging both contributions, it can be concluded that there are four prevalent pathways by which mindfulness possibly influences sustainable consumption in favorable ways. In what follows, these four mechanisms and related scholarly work are presented and discussed.

Disruption of Routines. In the context of sustainable consumption, Amel et al. (2009) used an adapted version of the Five Facet Mindfulness Questionnaire (FFMQ) instead of the widely adopted, but less nuanced Mindful Attention Awareness Scale (MAAS) and found that with its dimension of acting with awareness, mindfulness helps individuals consider behavioral options more consciously thereby positively influencing (self-reported) ecological behavior. The authors point out that attentional awareness is the key to notice and respond to the yet scarce, pro-environmental cues present in society. Armstrong (2012) corroborates this finding by demonstrating that mindfulness both disrupts and diminishes compulsive consumption patterns. Moreover, a study by Park & Dhandra (2017) established a negative direct correlation between dispositional mindfulness and impulsive buying tendencies, a relationship which is mediated by trait emotional intelligence. This finding further strengthens the general conclusion that more mindful individuals are able to better understand and manage their emotions, control their feelings, and ultimately resist unreflective buying due to their heightened attention and awareness to the present moment and their non-judgmental attitude.
**Congruence of Attitudes and Behavior.** Two studies found initial support for the contention that mindfulness may help reduce the attitude-behavior gap. Through interviews, Armstrong (2012) concludes that learning mindfulness can be linked to a greater confidence of individuals to engage in more attitude-conform behaviors. Similarly, when investigating organic food consumption, Von Essen & Mårtensson (2014) found that mindful eating broadens the thought-action repertoire and stimulates improved mind-body awareness.

**Cultivation of Non-Materialistic Values, Meaning in Life, and Well-Being.** Most of the existing empirical evidence is related to how mindfulness fosters sustainable consumption behavior through the internalization of non-materialistic values, the creation of meaning in life, and the increase in subjective well-being and health.

In a quite early academic article, Brinkerhoff & Jacob (1999) find support of the notion that mindfulness is an expression of downshifting and simple back-to-the-land values against the mainstream consumer culture including voluntary simplicity, ecological sensitivity, and being part of nature.

Brown & Kasser (2005) explored whether people can adopt lifestyles which mutually promote personal and planetary well-being through mindfulness. In fact, their empirical evidence shows that trait mindfulness and an intrinsic value orientation focusing on personal growth and community involvement are joint predictors for sustainable behavior and individual well-being.

Exclusively focusing on well-being as a mediator, Jacob et al. (2009) discovered a weak but significant relationship between mindfulness meditation and ecologically sustainable behavior and found that both variables are two related predictors of subjective well-being. The authors further posit that especially for ecologically and spiritually aware individuals, adopting an environmentally responsible lifestyle does not have a conflicting effect on personal quality of life.

Corroborating previous results, Armstrong (2012) also put forth evidence for a negative relation of mindfulness to material values and a positive relation to life satisfaction. Her studies show that mindfulness strengthens values connected to a sense of caring for the wider ecological
and social worlds in consumption decisions, while negatively affecting materialistic values. The findings also report that mindfulness improves self-regulation, body awareness, and overall awareness regarding compulsive buying related behavior.

Moreover, Von Essen & Mårtensson (2014) provide additional support for previous results related to subjective well-being by showing that mindfulness in the form of mindful eating increases well-being, vitality, and resilience. On a similar note, Geiger et al. (2018) identified individual health behaviors like improved nutrition and increased exercise as a mediator of the positive relation between mindfulness and ecological behavior. The increased present moment awareness cultivated through mindfulness facilitates the adoption of healthier lifestyles which in turn leads to enhanced sustainable behaviors.

Very much in line with the approach to mindfulness by Barbaro & Pickett (2016), a paper which will be discussed within the last pathway of mindfulness, but presenting yet different results, Hunecke & Richter (2019) call for a differentiated, multidimensional understanding of mindfulness in the research context related to sustainable consumption by including all five facets of the FFMQ (namely, observing, describing, acting with awareness, non-judging, and non-reactivity). In their study on sustainable food consumption, the authors only find the dimension of acting with awareness to have a weak, positive direct relation to sustainable food consumption, while other facets like observing only have an indirect effect which is serially mediated by construction of meaning, sustainability-related meaning, and personal norm.

Just as recently, Dhandra (2019) conducted a study demonstrating that dispositional mindfulness can provide triple dividend in the form of enhanced sustainable lifestyles with more temperance in consumption, reduced materialistic tendencies, and the mediating power of the two on the relationship between mindfulness and life satisfaction. While some of these findings support previous research results, this is the first study to establish a relation between mindfulness and social conscious purchasing as well as frugal purchasing.

To further test whether mindfulness is truly causally instrumental to enhance sustainable consumption through a reduction in the attitude-behavior gap and materialistic values as suggested
by the aforementioned cross-sectional and correlational research papers, Geiger et al. (2020) were the first to conduct a longitudinal experimental study with a sustainability-adapted mindfulness-based intervention. Contrary to the expectations, the mindfulness-based intervention did not have any direct effects on sustainable consumption behavior, related attitudes, or the reduction of the attitude-behavior gap. However, it resulted in greater well-being and less materialistic value orientations, which the authors believe could positively influence and foster environmentally responsible behavior in the long term. By drawing on the power of habit as a potential explanation for their findings, they suggest that an 8-week mindfulness-based intervention may suffice to trigger shifts in attitudes and value orientations but not to induce actual behavioral change.

**Prosocial Behavior and Connectedness.** Four studies have established primary empirical evidence for a positive effect of mindfulness on sustainable consumption through prosocial behaviors and a sense of connectedness.

Armstrong (2012) showed that mindfulness leads to a rise in reported empathy and moral concern for others beyond individuals’ close social circles. A finding by Von Essen & Mårtensson (2014) adds to this by demonstrating that organic food consumers experience a rise in perceived self-compassion.

Barbaro & Pickett (2016) added to this specific strand of research by concluding that trait mindfulness increases a sense of connectedness to nature which in turn enhances pro-environmental behavior. The cultivation of this particular value may even be the solution to the earlier outlined problem of psychological distance between the self and environmental issues that causes people to remain inactive. Feeling closer and more connected to nature may reduce this distance and promote higher environmental concern instead (Dutcher et al., 2007). Applying the full FFMQ in their research, Barbaro & Pickett (2016) could not replicate the previous finding by Amel et al. (2009). However, they identified a significant and direct connection between the two facets of observing and non-reactivity and sustainable behavior instead.

Further advancing primary research in this field, Panno et al. (2018) identified social dominance orientation (SDO) as another mediator in the relationship between mindfulness and
sustainable consumption. This empirical evidence enriches the findings by Barbaro & Pickett (2016) by considering a much broader and general orientation toward hierarchies among individuals, groups, and the natural world rather than focusing only on connectivity with nature. Individuals with high levels of SDO are competitive, less concerned about others, and in case of conflict they tend to choose personal over environmental gain. However, by promoting a more egalitarian and inclusive worldview and fostering empathic, other-focused concerns, and prosociality, the cultivation of mindfulness can reduce SDO and increase pro-environmental behaviors.

In light of the extant body of research on mindfulness and sustainable consumption and the characteristics of the applied research designs, it can be concluded that, despite putting forth promising correlational effects of mindfulness on sustainable consumption behaviors, the existing empirical evidence requires careful evaluation and more robust studies are needed to reveal not only a correlational but truly causal effect of mindfulness on sustainable behavior change (Fischer et al., 2017; Geiger et al., 2019). Moreover, while some of the pathways have received major attention thus far, the mechanism of prosocial behavior and connectedness remains yet to be explored in more depth.

This project is motivated by the recognition of this gap in extant research and created in response to the call for more randomized-controlled research designs in this domain. It contributes to the current state of research on the relationship between mindfulness and sustainable consumption by elucidating the mediating role of resourcefulness and prosocial tendencies. It does so by means of an experimental between-group comparison study including a mindfulness-based intervention with an active control condition. Accordingly, we will present the conceptual model of this study in the following chapter and develop the hypotheses to be tested within the scope of this research.
C. EMPIRICAL RESEARCH

5. Hypotheses Development and Conceptual Model

The goal of this study is to explore and answer the following research question:

“How does meditative state mindfulness impact consumers’ sustainable consumption decisions and how is this relation influenced by and related to the cultivation of a heightened sense of resourcefulness and a tendency to behave prosocially?”

Based on the theoretical background and the existing empirical evidence reviewed in the previous chapters, we derive several hypotheses which are geared toward this aim and organize them in the conceptual model of this project as depicted in Figure 3. However, before diving deeper into the development of these hypotheses, the four variables which our conceptual model is comprised of are clearly defined. First, the independent variable is state mindfulness based on Jon Kabat-Zinn’s school of meditative mindfulness (Hart et al., 2013). Second, resourcefulness, the perceived abundance of personal resources cultivated through the practice of meditation, is included as the first mediator in our theoretical framework. Regarding the remaining variables, it is crucial to provide a clearer differentiation of the previously outlined overlapping nature of the two constructs of prosocial behavior and sustainable consumption. Within the present study, we therefore propose to conceptualize one variable as being attitudinal and the other behavioral in nature. More precisely, sustainable consumption represents the dependent, behavioral variable in our experimental research design, while prosocial behavior is included as a second mediating, attitudinal variable. Going forward, we therefore refer to the latter variable as prosocial tendency, that is, the tendency of an individual to behave in a prosocial manner.

As discussed in the previous chapter, the meta-analysis by Geiger et al. (2019) demonstrates rather clearly the existence of a positive relationship between some facets of state mindfulness and sustainable consumption. However, as hinted at before, most studies to date merely found very small effects and are both cross-sectional and correlational in nature, calling for future research in this area with more methodological rigor achieved through randomized-controlled research designs.
with control groups (Fischer et al., 2017; Geiger et al., 2019). To contribute to improved rigor within this field of research by applying an appropriate method, which will be explained in the next chapter, and to advance the existing empirical findings regarding the role of meditative mindfulness in enhancing sustainable consumption behaviors, we include the hypothesis which has been guiding many prior studies:

**H1.** Meditative state mindfulness is positively related to sustainable consumption.

Further, we build on the paper by Orazi et al. (2021) who introduced the concept of resourcefulness in the mindfulness context and showed how it mediates the relationship between meditative state mindfulness and other-focused ethical behaviors. One can expect that sustainable consumption is comparable to such behaviors because it is also facilitated and nurtured by a certain attitude of altruism and a sense of care for others and the environment. We therefore predict:

**H2.** Meditative state mindfulness increases resourcefulness.

**H3.** The relationship between meditative state mindfulness and sustainable consumption is mediated by resourcefulness.

Moreover, the majority of empirical work on mindfulness and sustainable consumption suggests that there are a few powerful, indirect pathways or mechanisms through which mindfulness can stimulate change toward more sustainable consumption patterns (Fischer et al., 2017; Geiger et al., 2019). Comparing the extent to which each of those pathways received scholarly attention in contemporary research, it becomes clear that the mechanism of prosocial behavior, despite promising initial evidence provided by Panno et al. (2018) amongst others, is yet largely unresearched. Further, upon closer examination of how previously conducted studies associate higher prosocial behavior with mindfulness, it becomes evident that, to the best of our knowledge, there is no study which applies a direct measure for prosocial behavior or the tendency to act prosocially. Instead, they derive their conclusions from measuring different constructs related to prosocial behavior such as empathy and moral concern, self-compassion, connectedness to nature, or social dominance orientation (Armstrong, 2012; Von Essen & Mårtensson, 2014;
Barbaro & Pickett, 2016; Panno et al., 2018). Thus, to support and advance the credibility of existing findings, we further explore the mediating role of prosocial behavior in this research area and use a direct measure for prosocial tendency, which will be explained in more detail in the next chapter. We expect that prosocial tendency positively influences the link between mindfulness and sustainable consumption as suggested by initial evidence:

**H4.** Meditative state mindfulness increases prosocial tendency.

**H5.** The relationship between meditative state mindfulness and sustainable consumption is mediated by prosocial tendency.

Lastly, the cited literature on the construct of resourcefulness (Orazi et al., 2021; Levontin et al., 2014) points to the assumption that this perceived sense of abundance in personal resources cultivated through the practice of meditation may function as an upstream pathway which in turn causes a rise in individuals’ prosocial tendencies. This potential mechanism suggests adding a **serial mediation** to our conceptual model, implying that the mediator of resourcefulness may be the cause of the other mediator of prosocial tendency. Thus, our last hypothesis reads as follows:

**H6.** The relationship between meditative state mindfulness and sustainable consumption is serially mediated by resourcefulness and prosocial tendencies.

![Figure 3: Conceptual model (Own depiction).](image)
6. Methodology and Research Design

This chapter offers detailed insight into the research design of the randomized and actively controlled experimental study conducted within the scope of this project. In the pursuit of our goal to investigate and explain how mindfulness may influence sustainable consumption behaviors through a serial mediation of resourcefulness and prosocial tendency, we considered a between-group behavioral experiment with a loving-kindness meditation intervention and an active control group condition as best suited to observe individuals’ behaviors, test our hypotheses, and receive informed answers to our research question. We are therefore taking an objectivist and positivist philosophical stance to scientific research and use quantitative methods of analysis to shed light on our specific research interest. Within this chapter, the process of the final sample selection as well as the research design and procedure are described, followed by a discussion of the chosen approach and the employed materials for the experimental conditions and the manipulations included in the decision-making task of the experiment. After describing all the measures and control variables used in the study, the chapter ends with a reliability and validity analysis of the present research.

6.1 Sample Selection

Participants for this experimental study were recruited online by distributing an anonymous survey link primarily through social media platforms including posts on LinkedIn and in Facebook groups of CBS students. To rule out potential confounding effects caused by experienced meditation practitioners, people were only allowed to participate in the experiment if they confirmed not having a regular meditation practice (daily or 3-4 times per week).

Our study was run as a group comparison study for which in general a sample with a total of 60 participants (30 per condition) is recommended due to reasons of sufficient, that is, 80%, statistical power (Wilson & Morgan, 2007). The entire experiment was run remotely which is why we neither booked on-site experiment sessions nor had to account for potential no-shows. Instead, we checked the data collection process on an ongoing basis and closed the experiment after two
weeks, when we reached the threshold of 60 participants who met the inclusion criterion and did not fail any other check during our data cleaning procedure as outlined in Table 1.

<table>
<thead>
<tr>
<th>Step</th>
<th>Participants excluded (remaining)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting sample (participants who provided consent and started the study)</td>
<td>186</td>
</tr>
<tr>
<td>Deleted participants who reported already having a regular meditation practice</td>
<td>28 (158)</td>
</tr>
<tr>
<td>Deleted participants who dropped out before completing their assigned audio</td>
<td>40 (118)</td>
</tr>
<tr>
<td>Participants randomized into experimental conditions</td>
<td></td>
</tr>
<tr>
<td>LKM Control</td>
<td></td>
</tr>
<tr>
<td>Deleted participants who completed the entire study in less than 15 min or more than 27 min</td>
<td>26 (34)</td>
</tr>
<tr>
<td>Deleted participants who completed the entire study in less than 16.5 min or more than 28.5 min</td>
<td>16 (42)</td>
</tr>
<tr>
<td>Deleted participants who wanted to withdraw their responses in light of the debrief</td>
<td>0 (34)</td>
</tr>
<tr>
<td>Total retained for analysis</td>
<td></td>
</tr>
<tr>
<td>Final sample</td>
<td>34 (remaining: 42)</td>
</tr>
</tbody>
</table>

Note. We used a duration limit of 15-27 min for the LKM condition and 16.5-28.5 min for the control condition to account for the slightly different length of the two audio recordings and to remove all responses for which the duration either indicated that the participant skipped the whole or parts of the audio recording, or did not finish the experiment in one go.

Table 1: Data cleaning procedure and final sample (Own depiction).

From a starting sample of 186 participants, we excluded 68 participants because their responses were incomplete, or they reported already having a regular meditation practice. This experimental study was particularly designed to test the efficacy of a short meditation intervention in the form of a loving-kindness meditation (LKM) exercise which is why we wanted to avoid any confounding effects related to established meditation experience. Hence, regular meditation practice was used as an exclusion criterion for our sample. Moreover, due to the online character of our experiment set-up, we could only assess whether participants properly followed the instructions and listened to the entire recording by examining the overall duration of their response. The audio recording in the LKM treatment condition took around 12 min and the one in the control condition 13.5 min. The online platform used for this study estimated a response time for our survey questions of 7-8 min excluding the audio file, which results in an overall estimated response time of 19-21.5 min for the whole experiment. Mirroring this on a standard experiment setting in a research lab in which we would have assigned 30-minute time slots to each participant, we assume
that a response time of minimum 3 minutes and maximum 15 minutes to answer the survey questions after the audio intervention is appropriate. Additionally, factoring in the slight difference in audio length between the two groups, we thus included all responses of the treatment condition (control condition) with a total response time between 15-27 min (16.5-28.5 min) and excluded every participant who finished after a suspiciously short or long time. Ultimately, we arrived at a final sample of 76 people, with 34 being randomized into the LKM treatment condition and 42 to the control group.

Across both conditions, 61.8% were female and 34.2% male. Most of the participants were between 25 and 34 years old (n= 49; 64.5%) and had a university degree (Bachelor n = 21; Master n = 43). A monthly income level between 10,000 and 20,000 DKK was reported by 35.5% of the final sample, while 34.2% indicated even higher levels. In terms of nationalities, our group of participants was rather dispersed with the mostly represented nationalities being Spanish (n = 34), Danish (n = 8), German (n = 6), and South American (n= 5).

6.2 Experimental Design and Procedure

Due to the pandemic-related restrictions which were in place during the time of our data collection, we were prevented from getting access to a research lab to run our experiment in a directly controllable offline environment. Thus, we conducted the study fully online with the Qualtrics software for web-based surveys. An example of the study is attached in Appendix A. Considering that this is a behavioral experiment, we are aware that the purely remote and digital character of our research design may constitute a drawback limiting the findings of this project.

Nevertheless, we mitigated as best as possible the negative impacts of the lacking professionally curated environment by giving the participants very detailed instructions in the introduction of our study. As soon as a participant clicked on our survey link, they were asked to find a quiet and undisturbed space and to have their headphones ready before they proceeded to the actual study. Moreover, under the cover story that the experiment was designed to study consumer memory, they were informed that they will have to carefully listen to a YouTube audio recording. The use of a cover story was deemed appropriate in the context of our study because by
mentioning our interest in researching how mindfulness influences sustainable consumer decision-making, we would have risked biasing the participants’ behavior and responses. The procedure of using deceptive elements is also in line with related publications in the field (Orazi et al., 2021). By moving forward, participants provided their informed consent and answered the first question containing the exclusion criterion. In case they fell into the target population selected for this research, they were then asked to answer to a set of statements measuring trait mindfulness.

Following this, participants were randomly assigned to one of the two experimental conditions (LKM treatment group and active control group). They were reminded once again to put on their headphones and to truly listen to the entire audio recording before proceeding. Then, they could press play at their own convenience. When assigned to the treatment group, participants were guided through a recording of a LKM, whereas the control group listened to a TedTalk on mindfulness but without any practical meditation exercise. To increase the likelihood that participants listened to the full audio and to avoid that they accidentally and irreversibly proceeded before completion, they had to confirm with a forced control question that they listened until the end and were ready to continue with the study. After responding to a manipulation check, the participants were then exposed to the decision-making task of the experiment. One after another but in randomized order, they were shown six images of everyday consumer products from three different categories, and they were instructed to indicate their purchase intention for each of them. Subsequently, participants were presented with a collection of statements to measure first their level of perceived resourcefulness and then their prosocial tendency. In the end, they answered a few general demographic questions about themselves. To conclude, we debriefed the participants by thanking them and making them aware of the deceptive cover story used in the beginning of the study. We informed them about the actual purpose of our study and gave them the option to withdraw their responses considering the debrief.

6.3 Experimental Conditions and Decision-Making Task Manipulations

In what follows, the design of the two experimental intervention conditions and the creation of the manipulations for the decision-making task are explained and discussed in more detail.
**Experimental Conditions.** For the mindfulness intervention in this study, we set up two experimental conditions which enabled us to draw a between-group comparison. As explained earlier, all participants were randomly assigned to one of the two conditions with the main difference that one group was following a guided meditation exercise (treatment group) and the other was simply listening to an audio recording of a TedTalk on the power of meditative mindfulness without any active element of meditation (active control group).

In the following, more light is shed on the considerations which went into the selection procedure for the specific set-up and audio material of both the treatment and the control condition.

First, when choosing the design of the intervention for the treatment group, it is important to consider that meditative mindfulness can be practiced by engaging in different types of meditation. The meditation techniques most widely studied in scientific research so far are focused attention meditation (FAM), open monitoring meditation (OMM), and loving-kindness meditation (LKM) and it is suggested that the specific effects of meditation on cognitive processes can differ with the form of meditation being practiced (Lippelt et al., 2014; Lutz et al., 2008). While meditators in FAM intently focus their attention on a chosen sensory stimulus like their own breath or visual items like a candle flame and gently bring the attention back to this chosen target whenever their minds start to wander, the practitioners in OMM do not concentrate on a specific object or event. Instead, the monitoring of awareness itself is their attentional focus, that is, they pay close attention to wherever their minds travel without judging or reacting to any arising thought, feeling, or sensation and simply being present with each experience as it comes and goes (Lippelt et al., 2014).

In LKM, elements of both FAM and OMM are combined but it is a different technique insofar as it includes “actively changing cognitive and affective content, as opposed to simply observing or noting the presence of thoughts, emotions, and perceptions” (Dahl et al., 2015, p. 518). In a typical LKM session, the practitioner is encouraged to direct kindness, compassion, and caring feelings toward themselves by quietly reciting short phrases like ‘May I be well’ or ‘May I be happy’. The targets of these phrases are then gradually expanded to loved ones, neutral acquaintances, even difficult people, and ultimately and unexceptionally to all living beings.
including animals and plants (Birnie et al., 2010; Hofmann et al., 2011; Aspy & Proeve, 2017). Rooted in ancient Buddhist traditions, the practice of LKM is thereby intended to cultivate an unconditional, warm, and caring sense of benevolence, compassion, kindness, and love for all beings (Lippelt et al., 2014; Ericson et al., 2014; Engel et al., 2020).

Empirical evidence exists that shows that through LKM, practitioners become more mindful and aware of their surrounding environment (Fredrickson et al., 2008). Moreover, in their study, which was already mentioned in the chapter on prosocial behavior, Weng et al. (2013) demonstrated that compassion cultivated through LKM training results in greater altruistic behaviors, and even short LKM exercises were proven to increase individuals’ feelings of both social and nature connectedness (Hutcherson et al., 2008; Aspy & Proeve, 2017). Based on these scientific findings, we assume that LKM may be the best suited and most promising meditation technique to be used for the intervention in our study investigating the effect of meditative mindfulness on sustainable consumption behaviors. As explained earlier, for sustainable behavior change to happen, a sense of awareness and care for other people and the planet is an essential prerequisite, and training in LKM seems to establish and nurture just that. This logic is equally in line with work by Engel et al. (2020) who studied the effect of LKM on entrepreneurs’ sustainable decision-making and found that, mediated by higher compassion, participants who engage in a short LKM practice make more sustainable business-related decisions.

Focusing on a similar research interest in our project, we therefore selected a **guided LKM as treatment condition** for this experiment. We used an audio recording from YouTube (https://www.youtube.com/watch?v=sz7cpV7ERsM), in which a female voice guides the listener through a typical LKM session. It was adapted to a length of 11:49 min and its suitability for empirical research purposes has already been demonstrated in prior studies in the field (Logie & Frewen, 2015; Engel et al., 2020).

Second, for selecting an appropriate control condition for our experiment, a general reflection on the use of different control group types in mindfulness research is crucial. Despite its rapid growth during the past few decades, the body of publications in mindfulness research including MBSR-related interventions only puts forth “little evidence for its efficacy relative to
other treatments or for mindfulness practice per se as a specific mechanism for change” (Rosenkranz et al., 2013, p. 175). This is because the authors often rely on waitlist or no treatment comparison groups in their studies especially in the clinical and psychological research contexts. Although empirical evidence on the effectiveness of MBSR-related mindfulness training on mental and physical well-being can be put forth following such research approaches, it is impossible to use them to evaluate whether meditative mindfulness interventions are more powerful in comparison to other treatments or whether “mindfulness, itself, is the active ingredient leading to these positive outcomes” (Rosenkranz et al., 2013, p. 175; MacCoon et al., 2012).

Consequently, some researchers have begun to highlight the importance of including active control groups into mindfulness study designs instead which can mitigate the above-mentioned limitations and help avoid uninformative or misleading empirical findings. In the context of mindfulness, active control groups follow the purpose of matching the treatment intervention on common criteria like duration, structure, and intensity but they do not contain an active element of meditative mindfulness (MacCoon et al., 2012; Rosenkranz et al., 2019). Only through the comparison of a meditation intervention to a well-matched active control group condition, can the efficacy of the active meditative element be directly tested and potential unique positive effects to mindfulness can be identified (MacCoon et al., 2012; Vonderlin et al., 2020).

Despite this, only few authors so far followed suit and included such active control interventions in their research (MacCoon et al., 2012; Vonderlin et al., 2020). Rosenkranz et al. (2019) suggest a potential reason for the hesitant adoption of this standard by mentioning a lack of divergence in outcomes between meditative mindfulness treatment and active control groups and by hinting at an evident publication bias in this specific field of research. More precisely, extant research has uncovered that when directly comparing a MBSR intervention to an active control condition, both groups often show similarly improved outcomes. Hence, many scholars may still refrain from using active control groups to avoid null results in their research. However, it is of utmost importance to employ active control groups when exploring the benefits of meditative mindfulness because, from the lens of academic research, they substantially increase the level of scientific rigor which is “necessary to establish meditation practices as efficacious and efficient ways to promote wellbeing” (Rosenkranz et al., 2019, p. 182).
To contribute to this call for more scientific rigor in mindfulness research, we thus chose to employ a **TedTalk audio as active control group condition** in the design of our experimental study. In doing so, we ensured to evaluate as best as possible the potential effects unique to the LKM treatment. Hence, our process of finding well-matching audio material for the active control group was based on the following three factors. The recording had to (1) be similar in length compared to the treatment condition (13:25 min), (2) be spoken by a comparable female tone of voice, and (3) feature similar contextual content but no practical meditation exercise. The TedTalk recording which met all these three criteria was also retrieved from YouTube ([https://www.youtube.com/watch?v=IeblJdB2-Vo](https://www.youtube.com/watch?v=IeblJdB2-Vo)). Instead of being instructed to meditate, the participants in the control group condition listened to a female speaker sharing her story on the transformative power of mindfulness and meditation in a TedTalk. While we followed the procedure of prior academic work regarding the treatment audio recording, we did not incorporate the same control group audio as them because it failed to meet our second criterion (Logie & Frewen, 2015; Engel et al., 2020).

**Decision-Making Task Manipulations.** To explore the effect of the mindfulness intervention on the participants’ (sustainable) consumer choices, we manipulated six commercial images of everyday consumer goods from three different categories. For every category, we manipulated one sustainable and one premium choice (see Appendix A). Using a slider for providing their answer on a 5-point scale (1= extremely unlikely; 5= extremely likely; numbers were invisible to the respondents), participants indicated their buying intention for each product. To avoid answers biased by direct comparison, participants made their evaluation one by one and the order of the six images was fully randomized.

To increase the likelihood that the participants could confidently make a choice solely based on the product information provided in the pictures, we chose to feature only low involvement, everyday goods for which no specific prior knowledge or an extensive information search is required for the decision. This helps minimize cognitive load and reduce the probability that participants get overwhelmed with the task at hand because low involvement purchases are usually rather inexpensive and characterized by lower risk compared to high involvement products (Hoyer, 1984; Jain, 2019). Thus, presenting our participants low involvement choices during the
experiment ensured that they had enough information available to make timely and confident decisions. The selected products were chocolate, dish soap, and a t-shirt.

In the design of the commercial images, we strove to avoid any quality or aesthetic bias related to the brand, the price, or the origin of the products which could screw the final data. For this reason, we did not feature any prices or used countries of origin as unique selling points. Moreover, rather unknown or fictive brands were included to ensure that the participants’ evaluations were not influenced by any pre-established brand knowledge, attitudes, or associations. However, both the sustainable and the premium choices (visual and text copy) were created to be generally appealing but for different reasons, that is, either for their ecofriendly, other-focused, and moral worth, or for their premium, feel-good character. This design procedure is assumed to rule out as best as possible any potential confounding effects, and thereby laying the most ideal grounds for our endeavor to use this decision-making task for measuring the participants’ disposition to make sustainable choices.

For the sustainable options, we clearly featured logos and certifications on the product images like Fairtrade, EU organic logo, Global Organic Textile Standard (GOTS) logo, B Corp Certification, or text elements and symbols confirming the use of natural, recycled, and vegan resources and production processes free from animal testing. By using such a variety of sustainability-related cues, we were able to (1) properly base our study on the definition of sustainable consumption adopted in this project which includes not only environmental but also social and economic well-being, and (2) present the manipulations in subtle and less obvious ways to the participants.

For the premium choices, we selected cues that highlight more the potential of the products to provide personal pleasure, feel-good moments, and extraordinary consumption experiences. For example, we used symbols for number 1 bestsellers and award-winners, and textual cues including positively connotated words like ‘finest’, ‘premium’, ‘excellent’, ‘crafted’, ‘exclusive’, and ‘luxury’. At the same time, the visual design was kept rather minimalistic and more similar to the sustainable choices in order to avoid that the premium options will be perceived as too posh or viewed as a tool for conspicuous consumption.
In a way, the sustainable options were designed to reflect more of an other-focused orientation, while the premium options highlighted more self-focused benefits but in a subtle and non-judgmental manner. To ensure that the manipulations are perceived by the participants as intended, it would have been beneficial to run a pre-test in which the manipulated images of the six products are presented to and evaluated by a randomly selected group of people belonging to the target population of this study. In doing so, we would have been able to demonstrate that our manipulations indeed elicit sustainable or premium associations or, if necessary, we could have optimized the manipulations based on the feedback gathered from the pre-test. Due to restrictions in time and resources for this thesis project, we had to accept moving forward with the final distribution of our online experiment without pre-testing the manipulations used for the decision-making task. While we followed a careful and thoughtful process in creating the manipulations and therefore trust in their quality and potential to elicit the intended associations, we recognize the missing pre-test as limitation of this study which will be further elaborated upon in the final chapter.

6.4 Measures

All chosen measures for the variables of our conceptual model as well as the control variables are described within this section. To provide consistency throughout the study and to avoid confusion among the participants, we adapted all used measures, when necessary, to a 5-point Likert scale. The internal consistency reliability of the measurements was assessed by considering the values of Cronbach’s alpha. The $\alpha$ coefficients are interpreted according to the rules of thumb provided by George & Mallery (2003) which suggest a threshold of acceptable and higher reliability for values of $\alpha > 0.70$. Lower values are interpreted as questionable or poor and become unacceptable at $\alpha < 0.50$. Detailed interpretations and a discussion of the reliability analysis will follow in the last section of this chapter.

**Manipulation Check (State Mindfulness).** To test whether the meditation intervention was effective in putting the participants of the LKM condition into a more mindful state as opposed to the control group, we applied an established manipulation check scale consisting of three items (Hafenbrack et al., 2014; Engel et al., 2020). All participants were asked to reflect on their experience during the audio recording and report on a 5-point scale (1= not at all, 5= extremely)
the extent to which they (1) were focusing on their breathing, (2) were focusing on the physical sensation of breathing, and (3) felt in touch with their bodies (see Appendix B). The combined mean score was calculated and used as manipulation check with good internal consistency (\( \alpha = 0.81 \)). In the following data analysis process, the manipulation check reflects and informs the studied variable of state mindfulness, which is the independent variable in our conceptual model.

**Sustainable Consumption.** From the decision-making tasks with the manipulated product images, we derived a measure for the participants’ level of sustainable consumption, which is the dependent variable in the current study. From the buying intentions indicated by the participants on the slider with the 5-point Likert scale (1= extremely unlikely; 5= extremely likely), we developed a mean score across all three product categories reflecting the overall difference between sustainable and premium choices made. Positive (negative) scores can then be interpreted as higher (lower) sustainable consumption on average. The exact calculation process of this measure will be outlined in more detail in the next chapter on data analysis. An internal consistency of \( \alpha = 0.47 \) for the sustainable choices and \( \alpha = 0.09 \) for the premium choices was achieved. However, these low and theoretically unacceptable coefficients were not surprising which will be further explained in the reliability analysis.

**Resourcefulness.** Adopting an approach to resourcefulness which is in line with the work by Levontin et al. (2014) and Orazi et al. (2021), it comes as a logical consequence to not only lean the conceptual definition but also the measure of the variable for this study on prior research designs. Using the measure provided by Levontin et al. (2014), participants had to indicate how plentiful they felt in regard to six items representing different aspects of life including assets, friends, supportive family, success at work, energy, and security using a 5-point Likert scale (1= not at all, 5 = extremely; see Appendix C). Assessing the added value of the measure by Levontin et al. (2014) and the one applied by Orazi et al. (2021), which is inspired by Levontin et al. (2014) but shorter and more generalized, we concluded that integrating the former in our study will yield more differentiated data and allow for more granular insights into the specific life domains in which participants feel more or less resource abundant. Simultaneously, the mean score of all six answers provides us with each participant’s perceived abundance index (Levontin et al., 2014). Slightly
lower than in the original study ($\alpha = 0.80$; Levontin et al., 2014), the resourcefulness measure reached an acceptable Cronbach’s alpha of $\alpha = 0.71$ in our research.

**Prosocial (Behavioral) Tendency.** Further, to test the role of prosocial tendency in our conceptual model, we included a measure inspired by the work by Carlo & Randall (2002). In their research project, the authors established the Prosocial Tendencies Measure (PTM) which consists of 23 negatively phrased items to assess the following six types of prosocial behaviors: altruistic, compliant, emotional, dire, public, and anonymous. The validity and reliability of the PTM was successfully tested in two studies with samples of college students (Carlo & Randall, 2002). Thus, we deemed this measure highly appropriate to include in and tailor to our own study for two main reasons. First, our study was primarily distributed through channels which attracted an audience of university students, making our final sample similar to the ones used to develop the PTM. Second, the PTM evaluates differentiated forms of helping and therefore, rather than being generic, offers an opportunity to explore specific types of prosocial behaviors and to easily adapt the scale according to different research interests. Within the theoretical scope of our project, we have identified first and foremost the driving role of social influence and perception on prosocial behavior. Thus, we narrowed down the original PTM and only included the 9 items of the two subscales which assess the public and altruistic forms in our research. The items of the adapted PTM were presented to the participants as statements that may or may not describe them (Carlo & Randall, 2002). For example, items measuring public prosocial behavior were ‘I can help others best when people are watching me’ and ‘When other people are around, it is easier for me to help needy others’, whereas items such as ‘One of the best things about doing charity work is that it looks good on my resume’ and ‘I feel that if I help someone, they should help me in the future’ assessed altruistic prosocial behavior (see Appendix D for all items). Then, on a 5-point scale (1= not at all; 5= extremely well), the participants indicated how much each of these statements describes them. With a Cronbach’s alpha of $\alpha = 0.80$ ($\alpha = 0.65$) for the public (altruism) subscale, we reached a similarly acceptable internal consistency reliability as Carlo & Randall (2002) did when developing the scale ($\alpha = 0.80$ and $\alpha = 0.62$).
**Control Variables.** To ensure maximum validity and credibility of our results, we also included a few control variables in our study.

In the end of the experiment, participants were asked to report on some demographic variables. We controlled for their gender, age, level of education and monthly income, and nationality. This way, we could make sure that potential confounding individual differences were fully randomized across the two experimental groups.

Additionally, before being randomly assigned to the treatment or active control group, we measured the participants’ level of trait mindfulness. Controlling for this variable is a crucial step to avoid inherent differences in the participants’ general propensity to be mindful in everyday life between the two groups entering the experiment. Because if such differences exist, they could harm the explanatory power of any conclusions drawn regarding the effect of the meditation intervention on subsequently measured behaviors (Engel et al., 2020).

A well-established and widely used measure for trait mindfulness is the dispositional Mindful Attention Awareness Scale (MAAS) by Brown & Ryan (2003). Unlike other mindfulness scales, which were primarily developed for clinical research settings, the MAAS can be employed across a variety of different performance settings and audiences to assess mindfulness and thus, appears to be well suited for our study as well. However, it is relevant to point out that not every MAAS item is equally relevant to all respondents or to all settings which is why it can be valuable to evaluate the scale and its items in light of the specific research context at hand and then integrate it accordingly (Dane & Brummel, 2014). Inspired by Dane & Brummel (2014), who adapted the MAAS to their own research question, turning it into a measure of workplace mindfulness with selected items from the MAAS, we followed a similar approach for the present research. Given our interest in mindfulness in consumption contexts, we carefully evaluated each item of the MAAS based on its relevance and usefulness for respondents in their role as consumers. Through this process we finally selected six items of the original MAAS to form our measure of consumer mindfulness. Participants were guided by the prompt ‘In my role as a consumer’ when indicating how frequently or infrequently they recently had each of the six everyday experiences described within the items such as ‘I rush through activities without being really attentive to them’, ‘I could
be experiencing some emotion and not be conscious of it until sometime later’, and ‘I tend to walk quickly to get where I’m going without paying much attention to what I experience along the way’ (see Appendix E for all items of the adapted MAAS).

While the adapted MAAS measure of workplace mindfulness has yielded an acceptable internal consistency reliability of \( \alpha = 0.73 \) for Dane & Brummel (2014), which was our initial motivation to imitate their approach, we reached a rather poor consistency of \( \alpha = 0.58 \) with our adapted consumer mindfulness scale and must therefore acknowledge the shortcoming of our research design at this point. Our item selection was solely based on an intuitive, common-sense assessment of every MAAS item considering its logical relevance in an everyday consumer context. Due to the limited scope and time available for our project, we had to rely on this approximate procedure while we recognize that basing the scale development on insights gained through background interviews, like they were conducted by Dane & Brummel (2014), would have been a more substantiated empirical process to follow with greater chances of reaching higher reliability. The issue of poor reliability in our measure will be further discussed in the next section.

### 6.5 Reliability Analysis and Research Validity

**Reliability Analysis.** Overall, the used measures for the variables in our study have shown acceptable to good values of internal consistency reliability as summarized in Table 2. Moreover, we accept the questionable alpha coefficient of \( \alpha = 0.65 \) for the PTM altruism subscale because, in fact, it is a relatively good score compared to the \( \alpha = 0.62 \) reached by Carlo & Randall (2002) who established and validated the PTM. Further, we tried to improve the poor reliability reached for our trait consumer mindfulness measure (\( \alpha = 0.58 \)) by revising the selected items and checking whether the removal of the item(s) which showed the highest variance would improve the alpha coefficient. However, we only yielded lower values by following this approach because a few of the items had a variance above 1 and Cronbach’s alpha is very sensitive in general to scale shortening. Therefore, within the scope of our research, we accept the low Cronbach’s alpha for measuring trait consumer mindfulness, but we highly encourage future research to overcome this weakness by testing and revising the item selection for example by means of running background interviews which we
believe is the main cause of this internal reliability consistency issue. More on this limitation will be covered in the final chapter of this thesis.

For the sake of completeness, we also determined the alpha coefficients for both the sustainable and the premium choices included in our sustainable consumption measure. However, the presented items within the sustainable and premium category were not really related to each other as usually is the case for measurement scales. More precisely, a person might have chosen the sustainable (premium) dish soap and the t-shirt but not the chocolate simply because they do not like eating chocolate in general. However, the alpha coefficient would conclude an internal inconsistency in sustainable (premium) choices from this set of answers. It is therefore not very meaningful to apply Cronbach’s alpha in this context and we thus decided to neglect its interpretation for the sustainable consumption measure. Future research may detect alternative and more conclusive ways to evaluate the reliability of this measurement.

<table>
<thead>
<tr>
<th>α</th>
<th>Interpretation</th>
<th>Construct and reliability analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 0.90</td>
<td>excellent</td>
<td></td>
</tr>
<tr>
<td>&gt; 0.80</td>
<td>good</td>
<td>manipulation check α = 0.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PTM public subscale α = 0.80</td>
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<tr>
<td>&gt; 0.70</td>
<td>acceptable</td>
<td>resourcefulness α = 0.71</td>
</tr>
<tr>
<td>&gt; 0.60</td>
<td>questionable</td>
<td>PTM altruism subscale α = 0.65</td>
</tr>
<tr>
<td>&gt; 0.50</td>
<td>poor</td>
<td>trait consumer mindfulness α = 0.58</td>
</tr>
<tr>
<td>&lt; 0.50</td>
<td>unacceptable</td>
<td>sustainable choices α = 0.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>premium choices α = 0.09</td>
</tr>
</tbody>
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Note. The interpretations of Cronbach’s alpha α are based on George & Mallery's (2003) recommended rules of thumb.

Table 2: Cronbach’s alpha interpretations and reliability analysis (Own depiction).

Validity. To ensure maximum quality and integrity of our research, we carefully selected and incorporated first and foremost well-established measures and scales from existing publications into our study thereby guaranteeing high measurement validity, that is, that the used measurements actually reflect the concepts of our model as intended (Bell et al., 2018).
Regarding **internal validity**, which is concerned with the extent to which a study accurately allows for drawing inferences about a causal relationship between two variables, our research is however limited (Bell et al., 2018). Due to its cross-sectional design through which we investigate how the independent variable of (state) mindfulness predicts the dependent variable of sustainable consumption in consideration of two mediators only at one single point in time, our study is unable to establish a direct causal relationship between the variables of our conceptual model. The directional interpretation of our findings therefore should be taken cautiously. This causality issue is further addressed in the last chapter considering the limitations of this project. However, it is equally important to note that the use of an experimental intervention, the inclusion of an active control group, and the randomization of participants regarding treatment and control group, are all factors which improve the internal validity of this project.

To maximize **external validity**, which refers to how well the findings of our study can be generalized and expected to apply to other settings, people, or time periods, we put particular effort into our sampling procedure to recruit a representative sample for our behavioral experiment (Bell et al., 2018). We ensured that our final sample is representative of the larger population of meditation novices by adding an exclusion criterion to our study so that only people without a regular meditation practice were able to participate. Moreover, we paralleled our experimental variables with general demographic characteristics (gender, age, education and income levels, nationality). However, after collecting the data, we recorded a final sample which is mainly represented by Spanish, female participants assumed to be students or young professionals based on interpretations of age, education, and income levels. These specificities in our sample compromise the external validity of our study. On a positive note, while Wilson & Morgan (2007) recommend a total of 60 participants for a statistically powerful group comparison study, our total sample size included 76 individuals who were randomly assigned to our experimental conditions, thereby positively influencing the external validity of the present research. Lastly, understood as another aspect of external validity that evaluates the generalizability of empirical findings to the real and natural world, the **ecological validity** of our research is affected in two ways (Bell et al., 2018). Ecological validity is said to increase when people are (ideally unknowingly) observed in their natural behavioral patterns (Bell et al., 2018). This is why both the self-reporting nature and
the hypothetical decision-making scenario of our online study limit the ecological validity of this research. However, we counteracted this issue by including a deceptive cover story so that our participants provided their answers in the experiment without knowing the real purpose of the research. In addition, thanks to the hypothetical decision-making scenario employed in the study, the independent variable of sustainable consumption was measured without the participants being aware of it which further helped establish higher ecological validity for this research project.

7. Data Analysis and Results

In this chapter, the analysis of the collected data and the results of the experiment will be presented. First, a descriptive analysis is carried out to explore the characteristics of the sample population as well as the control and experimental variables. Next, some inferential analyses are performed to investigate the statistical differences between groups and the potential correlations between the studied variables as well as to test the proposed serial mediation of our conceptual model.

In order to analyze the data collected with our experiment, we used the statistical analysis program R (see Appendix F for the full script). Additionally, Microsoft Excel was applied to run simpler calculations.

Due to the quantitative nature of this study, the final aim of the data analysis and results chapter is to reject or not to reject the hypotheses which were developed in chapter 5. For this purpose, a variety of statistical tests was needed for drawing a between-group comparison. Moreover, to measure the statistical relationship between the studied variables, a widely used correlation test, Pearson’s correlation coefficient test, was performed. Finally, a serial mediation analysis was conducted to examine how the dependent variable (sustainable consumption) changes as the independent variables (state mindfulness, resourcefulness, and prosocial tendency) change. All of these analyses ultimately allow for the testing and the rejection or non-rejection of our hypotheses. Lastly, given that this project is not intended for publication in an academic journal, evidences of up to 10% are deemed appropriate to reject the null hypotheses (p-value < 0.10). In other words, we used two-tailed 90% confidence intervals.
7.1 Descriptive Statistics

In this section, a descriptive statistical analysis of the different demographic variables is performed. Table 3 shows the detailed aspects of the final sample population which were already summarized in the sample description in the beginning of chapter 6. For a more visual impression of the final sample composition, Figure 4 provides diagrams for the variables age (in %), education and monthly income (in absolute numbers of respondents per category), and nationality (in %).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sample (N= 76)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
</tr>
<tr>
<td>Female</td>
<td>47</td>
</tr>
<tr>
<td>Non-binary/third gender</td>
<td>1</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>2</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>14</td>
</tr>
<tr>
<td>25-34</td>
<td>49</td>
</tr>
<tr>
<td>35-44</td>
<td>10</td>
</tr>
<tr>
<td>45-54</td>
<td>3</td>
</tr>
<tr>
<td>55 or older</td>
<td>0</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>0</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>High school graduate</td>
<td>7</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>21</td>
</tr>
<tr>
<td>Master degree</td>
<td>43</td>
</tr>
<tr>
<td>Doctorate and higher</td>
<td>4</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>1</td>
</tr>
<tr>
<td><strong>Monthly Income</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; 10,000 DKK (&lt; 1.345 €)</td>
<td>19</td>
</tr>
<tr>
<td>10,000 - 20,000 DKK (1.345 € - 2.690 €)</td>
<td>27</td>
</tr>
<tr>
<td>&gt; 20,000 DKK (2.690 €)</td>
<td>26</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>4</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>34</td>
</tr>
<tr>
<td>Danish</td>
<td>6</td>
</tr>
<tr>
<td>German</td>
<td>8</td>
</tr>
<tr>
<td>South American</td>
<td>5</td>
</tr>
<tr>
<td>North American</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
</tr>
</tbody>
</table>

Table 3: Descriptive statistics of the final sample (Own depiction).
After describing the sample population, a descriptive analysis for the control and experimental variables is performed. It is important to note that some coding systems were used for the different variables in the data collection process which will be explained in the following. Moreover, our study features three different types of variables, namely, categorical, ordinal, and continuous. For each type, different descriptive test statistics are calculated. First, for gender, the categorical variable, the frequency distributions for both experimental groups are determined and compared.

**Gender.** Gender was coded as 1 = Male, 2 = Female, 3 = Non-binary / third gender, and 4 = Prefer not to say. We decided to provide four options instead of only two because we wanted people
to be able to truly identify with their answer and to not feel forced to provide an answer in the first place. Table 4 shows the absolute values for the distribution of participants per experimental group regarding their indicated gender.

<table>
<thead>
<tr>
<th>Group</th>
<th>Male</th>
<th>Female</th>
<th>Non-binary/Third gender</th>
<th>Prefer not to say</th>
</tr>
</thead>
<tbody>
<tr>
<td>LKM (n = 34)</td>
<td>14</td>
<td>19</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Control (n = 42)</td>
<td>12</td>
<td>28</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

**Table 4:** Gender distribution per experimental group (Own depiction).

After the descriptive analysis for the categorical variable, we examine the ordinal variables age, education, and monthly income. To assess the central tendency, the mode and the median are calculated for each of the three variables, while the range indicates their variability. Table 5 shows the results of these descriptive test statistics.

<table>
<thead>
<tr>
<th>Ordinal Variable</th>
<th>LKM (n = 34)</th>
<th>Control (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mode: 2 (25-34)</td>
<td>Mode: 2 (25-34)</td>
</tr>
<tr>
<td></td>
<td>Median: 2 (25-34)</td>
<td>Median: 2 (25-34)</td>
</tr>
<tr>
<td></td>
<td>Range: 3</td>
<td>Range: 3</td>
</tr>
<tr>
<td>Education</td>
<td>Mode: 3 (Master Degree)</td>
<td>Mode: 3 (Master Degree)</td>
</tr>
<tr>
<td></td>
<td>Median: 3 (Master Degree)</td>
<td>Median: 3 (Master Degree)</td>
</tr>
<tr>
<td></td>
<td>Range: 3</td>
<td>Range: 4</td>
</tr>
<tr>
<td>Monthly Income</td>
<td>Mode: 2 (10,000 - 20,000 DKK)</td>
<td>Mode: 3 (&gt;$20,000 DKK)</td>
</tr>
<tr>
<td></td>
<td>Median: 2 (10,000 DKK)</td>
<td>Median: 2 (10,000 DKK)</td>
</tr>
<tr>
<td></td>
<td>Range: 3</td>
<td>Range: 3</td>
</tr>
</tbody>
</table>

**Table 5:** Mode, median, and range for the ordinal control variables (Own depiction).

**Age.** The age variable was coded as 1 = 18-24 years, 2 = 25-34 years, 3 = 35-44 years, 4 = 45-54 years, 5 = 55 years or older, and 6 = Prefer not to say. Table 5 shows that the mode and median for both groups is 2 which refers to the age group of 25 to 34 years. Moreover, Figure 5 visually shows the frequency distribution in absolute values for both groups. Age was asked to be indicated in groups to make the response easier and faster for the participants, though at the expense
of this variable being ordinal instead of continuous which would have provided a much more accurate statistical analysis.

![Age Frequency Distribution](image)

**Figure 5:** Age frequency distribution in absolute values (Own depiction).

**Education.** Education was coded as 1 = High school graduate, 2 = Bachelor degree, 3 = Master degree, 4 = Doctorate and higher, and 5 = Prefer not to say. Table 5 shows that there are no differences between the experimental groups in terms of mode and median because the rank number 3, Master degree, is predominant in both groups. Moreover, Figure 6 shows the frequency distribution in absolute values for education per group.

![Education Frequency Distribution](image)

**Figure 6:** Education frequency distribution in absolute values (Own depiction).
**Monthly Income.** Monthly income was coded as 1 = < 10.000 DKK (< 1.345 €), 2 = 10.000 - 20.000 DKK (1.345 € - 2.690 €), 3 = > 20.000 DKK (2.690 €) and 4 = Prefer not to say. Table 5 shows that the mode for both groups is different. While it is at rank number 2 (10.000 - 20.000 DKK) for the LKM group, the mode for the control group is at rank number 3 which refers to monthly incomes of more than 20.000 DKK. This indicates that members of the control group may have higher monthly incomes than those of the LKM group. Figure 7 demonstrates the frequency distribution in absolute values for monthly income in both groups.

![Monthly Income]

**Figure 7:** Monthly income frequency distribution in absolute values (Own depiction).

Next, we run the descriptive analysis of the continuous variables by calculating their means (M) and standard deviations (SD) which are presented in Table 6.

<table>
<thead>
<tr>
<th>Variable</th>
<th>LKM (n = 34)</th>
<th>Control (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Trait Mindfulness</td>
<td>2.89</td>
<td>0.53</td>
</tr>
<tr>
<td>Manipulation Check (State Mindfulness)</td>
<td>3.39</td>
<td>0.8</td>
</tr>
<tr>
<td>Sustainable Consumption</td>
<td>0.25</td>
<td>1.03</td>
</tr>
<tr>
<td>Resourcefulness</td>
<td>3.66</td>
<td>0.49</td>
</tr>
<tr>
<td>Prosocial Tendency</td>
<td>1.58</td>
<td>0.49</td>
</tr>
</tbody>
</table>

**Table 6:** Means and standard deviations of continuous variables (Own depiction).
**Trait Consumer Mindfulness.** As already explained in the methodology chapter, trait consumer mindfulness was measured on a 5-point Likert scale. The mean for the LKM group is \( M = 2.89 \) while it is \( M = 3.09 \) for the control group. It is important to note that the MAAS, which was used to assess this variable, is a negatively phrased scale and interpretations therefore follow the logic: the higher the mean score per group, the lower the level of trait mindfulness. Thus, it can be concluded that the LKM group showed a higher average level of trait mindfulness with a slightly lower mean score compared to the control group.

**Manipulation Check (State Mindfulness).** The measure for state mindfulness was also evaluated on a 5-point Likert scale. Table 6 shows that the mean for the LKM group is a bit higher than the one for the control group (\( M_{Lkm} = 3.39 \) and \( M_{Control} = 2.75 \)). This difference between means indicates that the LKM group felt more focused on their breathing and their bodies than the control group did. The manipulation check is used to measure the state mindfulness of the participants.

**Sustainable Consumption.** As outlined in the previous chapter, to analyze the variable of sustainable consumption, participants were shown six product images from three different categories and were asked to evaluate on a 5-point Likert scale how likely they are to buy each of those products. One product of each category was sustainable and the other one was premium. In order to compare the results and to analyze how sustainably the participants consume, the following calculations are needed: first, the scores given to sustainable and premium products are individually compared by category. Second, the scores given to the premium products were subtracted from the sustainable ones. This way, a positive result means that higher scores were given to sustainable products while a negative result means that higher scores were given to premium products. Finally, the average score for the three categories combined was calculated (see Table 6). Sustainable consumption mean scores are \( M = 0.25 \) for the LKM group and \( M = 0.71 \) for the control group. These positive numbers indicate that, on average, both groups evaluate sustainable products higher than the premium ones. However, the control group scored on average 0.71 points more for the sustainable choices than for the premium ones. In contrast, the LKM group only scored 0.25 points more for the sustainable choices than for the premium ones on average. Thus, the comparison of these two means indicates that the members of the control group surprisingly show higher levels of sustainable consumption.
**Resourcefulness.** The participants’ perceived level of resourcefulness was indicated on a 5-point Likert scale. The means for both groups are $M_{LKM} = 3.66$ and $M_{Control} = 3.87$. This shows that on average, both groups felt quite plentiful in personal resources regarding different aspects of life.

**Prosocial Tendency.** A 5-point Likert scale was used to measure prosocial tendency. The mean for the LKM group is $M = 1.58$ and $M = 1.54$ for the control group. The PTM, which is the measure used to assess prosocial tendency, is a negatively phrased scale. This implies that the lower the means are, the more prosocial tendencies both groups present. Therefore, both groups are centered within the lower half of the scale, representing higher prosocial tendencies.

Finally, Figure 8 shows a visual representation of the mean differences between the two experimental groups for the different continuous variables.

![Figure 8: Mean differences between groups (Own depiction).](image)

**7.2 Inferential Statistics**

The analysis of the differences between groups, the relationships between the different variables and their effects on the dependent variable (sustainable consumption) are studied in this section.

As introduced in the beginning of the chapter, different statistical tests and methods are needed to investigate the veracity of the hypotheses. First, the Student’s $t$ test, Chi-Square, and
Mann-Whitney U test are used to find potential statistically significant differences between groups. Next, a correlation analysis, using Pearson’s correlation coefficient, is carried out. Lastly, a serial mediation analysis is performed to analyze the effect of each independent variable on sustainable consumption and to test the hypotheses of the conceptual model.

7.2.1 Statistical Tests for Between-Group Comparisons

In this section, some statistical tests are presented to evaluate potential differences between the two experimental groups. Different forms of statistical tests were needed due to the varying nature of the variables in question. First, the Chi-Square test was used for gender because it is a categorical variable and the categories are mutually exclusive (McHugh, 2013). Secondly, the Mann-Whitney U test (also called Wilcoxon signed-rank test) was applied for age, education, and monthly income because they are ordinal variables and two groups are to be compared (Karadimitriou & Marshall, n.d.). Finally, the Student’s t test was used to analyze and compare the differences between groups in terms of trait consumer mindfulness, state mindfulness, sustainable consumption, resourcefulness, and prosocial tendency. To use the Student’s t test, at least one of the following two conditions needs to be met: (1) the variables follow a normal distribution in both groups and/or (2) sample sizes are larger than 30 participants. In our case, both groups, that is populations, are larger than 30 participants ($N_{Lkm} = 34$ and $N_{Control} = 42$). Therefore, the Central Limit Theorem (CLT) applies, which states “that the distribution of sample approximates a normal distribution as the sample size becomes larger, assuming that all samples are identical in size, and regardless of the population distribution shape” (Ganti, 2021, para. 1).

Table 7 shows the results and probabilities of the statistical tests between the experimental groups for all the variables used in this study. Moreover, Table 7 contains the Cohen’s d value for each variable. The Cohen’s test helps measure the effect size of the variables, in other words, it helps compare the means of the two groups per variable. For the interpretation of the Cohen’s d value, $d = 0.2$ represents a small effect size, $d = 0.5$ is considered a medium and $d = 0.8$ a large effect size (McLeod, 2019). Hence, the studied variables in this research mostly show small to medium effect sizes. Moreover, the Cohen’s d effect tells us the direction of the effect. This is why
the majority of our d-values are negative since the mean in the control group was usually higher than in the LKM group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test statistic</th>
<th>p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>χ²(1) = 0.736</td>
<td>0.391</td>
<td>-0.31</td>
</tr>
<tr>
<td>Age</td>
<td>w = 574</td>
<td>0.087*</td>
<td>-0.38</td>
</tr>
<tr>
<td>Education</td>
<td>w = 735.5</td>
<td>0.649</td>
<td>0.00</td>
</tr>
<tr>
<td>Monthly Income</td>
<td>w = 612.5</td>
<td>0.714</td>
<td>-0.16</td>
</tr>
<tr>
<td>Trait Mindfulness</td>
<td>t(74) = -1.62</td>
<td>0.109</td>
<td>-0.37</td>
</tr>
<tr>
<td>Manipulation Check (State Mindfulness)</td>
<td>t(74) = 3.05</td>
<td>0.003**</td>
<td>0.70</td>
</tr>
<tr>
<td>Sustainable Consumption</td>
<td>t(74) = -1.88</td>
<td>0.064*</td>
<td>-0.43</td>
</tr>
<tr>
<td>Resourcefulness</td>
<td>t(74) = -1.56</td>
<td>0.123</td>
<td>-0.36</td>
</tr>
<tr>
<td>Prosocial Tendency</td>
<td>t(74) = 0.41</td>
<td>0.686</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Note. Test statistic refers to the Chi-Square test; Student's t test or Mann-Whitney U Test depending on the nature of the variable in question. p refers to the probability of obtaining test results at least as extreme as the results actually observed, under the assumption that the null hypothesis is correct. Effect size refers to Cohen's d. Gender, Education and Monthly Income are skewed since we could not include all of the 76 participants.

* p < 0.1 (two-tailed)
** p < .05 (two-tailed)

Table 7: Statistical tests for the between-group comparison (Own depiction).

Regarding the demographic factors, Table 7 shows that there are no significant differences between groups in terms of gender, education, and monthly income. However, the statistical results for these three variables need to be interpreted with caution because they are skewed due to the fact that, for ethical reasons, we could not include all of the 76 participants. This will be further addressed in the general discussion chapter. Nevertheless, the available results are favorable because they allow for the comparison of both groups. In contrast, we found a significant difference between groups in terms of age (w = 574; p = 0.089). This result was not expected, and age will be subjected to more statistical tests to make sure that the experimental groups are comparable, and age is not influencing the dependent variable (sustainable consumption). The results of these tests will be presented in the end of this section.
Moreover, the results also indicate that there are no differences between groups in terms of **trait consumer mindfulness** levels measured with the adapted MAAS. This means that both experimental groups are comparable regarding trait mindfulness. In contrast, we have found a significant difference between the mean scores of the **manipulation check (state mindfulness)** for the LKM and the control group ($M_{Lkm} = 3.39$, $SD = 0.8$; $M_{Control} = 2.75$, $SD = 0.98$; $t(74) = 3.05$; $p = 0.003$; $d = 0.7$). This finding indicates that the LKM intervention was successful and effective in bringing the members of the treatment group into a higher state of mindfulness compared to the control group, which confirms our expectations.

Regarding the other variables, we did not find any statistically significant differences for **resourcefulness** and **prosocial tendency** between groups, but we did find a significant difference for sustainable consumption. The members of the control group made on average significantly more sustainable decisions than the LKM group ($M_{Lkm} = 0.25$, $SD = 1.03$; $M_{Control} = 0.71$, $SD = 1.05$; $t(74) = -1.88$; $p = 0.064$; $d = -0.43$).

**Additional Analysis of the Control Variable Age**

Because statistically significant differences between the two experimental groups were found in terms of age, performing an additional analysis is deemed appropriate to ensure the independence of age from the experimental variables. For this purpose, a correlation test was conducted. Because age is an ordinal variable in this research, the values obtained using the ordinal scale are not continuous but their corresponding ranks are. This is why it is possible to use Pearson’s correlation coefficient on those ranks (Choi et al., 2010).

Table 8 shows the results of the Pearson’s correlation coefficient analysis. It demonstrates that age is not significantly correlated with any of the studied variables. Hence, the between-group comparison is also possible controlling for the age variable.
### Table 8: Pearson’s correlation coefficients related to age (Own depiction).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Mindfulness</td>
<td>0.070</td>
</tr>
<tr>
<td>State Mindfulness</td>
<td>-0.002</td>
</tr>
<tr>
<td>Sustainable Consumption</td>
<td>0.067</td>
</tr>
<tr>
<td>Resourcefulness</td>
<td>0.094</td>
</tr>
<tr>
<td>Prosocial Tendency</td>
<td>-0.009</td>
</tr>
</tbody>
</table>

Note. The numbers represent Pearson’s r. None of the presented correlations are significant (p > 0.1).

However, it is further assumed that the effect of the three ordinal control variables on sustainable consumption should also be evaluated by using a logistic linear regression in order to be able to discard any kind of effect of age, education, and monthly income on sustainable consumption. Table 9 shows the results of this regression. They indicate that neither age, education nor monthly income have a significant influence on sustainable consumption. Therefore, the analysis confirms that the comparison between the groups is possible in terms of all demographic data.

| Variable            | $\beta$ | Std. Error | t - value | $P(>|z|)$ |
|---------------------|---------|------------|-----------|-----------|
| Age                 | 0.165   | 0.182      | 0.907     | 0.368     |
| Education           | -0.130  | 0.156      | -0.821    | 0.414     |
| Monthly Income      | -0.187  | 0.144      | -1.300    | 0.198     |

Table 9: Logistic linear regression analysis for age (Own depiction).

### 7.2.2 Pearson’s Correlation Coefficient Analysis

Next, a correlation analysis, using Pearson’s correlation coefficient, was performed to measure the statistical relationship between the variables. Table 10 shows these correlations between the studied variables. For example, state mindfulness and sustainable consumption show a positive correlation coefficient ($r = 0.01$, $p = 0.92$) which means that the higher the state of mindfulness of individuals, the more sustainable choices they make. Moreover, a positive
correlation coefficient was found between state mindfulness and resourcefulness \((r = 0.162, p = 0.16)\). That is, the higher people are in state mindfulness, the higher their levels of resourcefulness would be. On top of that, it was found that resourcefulness and prosocial tendency have a negative correlation coefficient \((r = -0.123, p = 0.29)\). This implies that the more personal resources individuals feel to have, the higher their tendency to behave prosocially, bearing in mind that the PTM is negatively phrased. However, it can be concluded that none of the correlations outlined in Table 10 are strong since their \(r\) values are less than 0.5 \((r < 0.5)\). Moreover, none of the correlations in Table 10 are statistically significant because of \(p > 0.1\).

<table>
<thead>
<tr>
<th>Variable</th>
<th>State Mindfulness</th>
<th>Sustainable Consumption</th>
<th>Resourcefulness</th>
<th>Prosocial Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Mindfulness</td>
<td>0.81</td>
<td></td>
<td>0.123</td>
<td>0.71</td>
</tr>
<tr>
<td>Sustainable Consumption</td>
<td>0.012</td>
<td>0.47</td>
<td>-0.043</td>
<td>0.81</td>
</tr>
<tr>
<td>Resourcefulness</td>
<td>0.162</td>
<td>-0.043</td>
<td></td>
<td>-0.123</td>
</tr>
<tr>
<td>Prosocial Tendency</td>
<td>0.071</td>
<td>0.081</td>
<td>-0.123</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Table 10: Pearson’s correlation coefficients for the studied variables (Own depiction).

Additional Correlation Analysis for Trait Mindfulness

Although trait consumer mindfulness is only a control variable in our model which allowed us to contrast both groups and make sure that they are comparable, some additional correlation analyses were carried out with it. The variable is not included in our hypotheses, but it is believed that trait mindfulness may provide some valuable insights for our study context and the general discussion of our research.

Table 11 shows the correlations between trait mindfulness measured with the MAAS by Brown & Ryan (2003) and the rest of the studied variables. A positive significant correlation between trait mindfulness and prosocial tendency was found \((r = 0.19, p = 0.09)\). However, it is not a strong correlation since \(r < 0.5\). Nevertheless, this positive correlation means that if one of the variables increases the other one increases as well. Because the two scales used for the two
variables are negatively phrased, the positive correlation means that individuals showing higher levels of trait mindfulness tend to behave more prosocially.

Moreover, a negative relationship between trait mindfulness and state mindfulness was detected ($r = -0.317$, $p = 0.01$). Because low values on the trait mindfulness scale indicate higher levels of trait mindfulness, this statistically significant correlation means that the higher individuals are in trait mindfulness, the higher they also score in state mindfulness. However, this correlation is rather weak since $r = 0.317$ is lower than 0.5.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Trait Mindfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait Mindfulness</td>
<td>0.580</td>
</tr>
<tr>
<td>State Mindfulness</td>
<td>-0.317**</td>
</tr>
<tr>
<td>Sustainable Consumption</td>
<td>-0.106</td>
</tr>
<tr>
<td>Resourcefulness</td>
<td>-0.147</td>
</tr>
<tr>
<td>Prosocial Tendency</td>
<td>0.193*</td>
</tr>
</tbody>
</table>

Note. The numbers represent Pearson's r. Internal consistency reliability is also presented for the Trait Mindfulness variable.
* $p < 0.1$ (two-tailed).
** $p < 0.01$ (two-tailed).

Table 11: Pearson’s correlation coefficients related to trait mindfulness (Own depiction).

7.2.3 Serial Mediation Analysis

The previous statistical analyses helped examine the differences between groups and investigate the correlations between the studied variables. However, insight is still missing on how the independent variables (state mindfulness, resourcefulness, and prosocial tendency) influence the dependent variable (sustainable consumption) in our conceptual model. In order to study this and considering that our conceptual model proposes mediating effects, a serial mediation analysis was performed which will ultimately allow for the testing of the hypotheses. Since the serial mediation analysis is quite complex, its process was divided into four steps to provide a better understanding of the outputs. First, the direct influence of state mindfulness on sustainable
consumption was investigated. Secondly, resourcefulness was examined as a mediator of the influence of mindfulness on sustainable consumption. Third, prosocial tendency was explored as another mediator of the relationship between mindfulness and sustainable consumption. Lastly, both mediators were taken into account to analyze their joint, serial effect on sustainable consumption.

The serial mediation analysis allows us to study how the independent variables influence the dependent variable through the regression coefficients ($\beta$). In Table 2, different parameters can be seen, labeled from ‘a’ to ‘f’, which represent all particular effects on the different variables (see Figure 9 for a visual representation). The regression coefficients ($\beta$) indicate whether there is a positive or negative relation between the variables and how much effect the studied variables have on each other. Moreover, Table 2 shows the standard errors for the coefficients, the value of the z-test, and the p-value. The z-test is the test statistic used by the statistical software R to perform the serial mediation.

![Table 2: Test statistics and regression coefficients of the conceptual model (Own depiction).](image)

None of the studied effects is statistically significant since every p-value is higher than 0.10. However, it should be noted that parameter ‘a’, which represents the effect of state mindfulness on resourcefulness ($\beta = 0.097; z = 1.431$), has a p-value of $p = 0.152$ and thus, has potential to become
marginally significant with a larger sample size. This result suggests that there may be a positive relationship between state mindfulness and resourcefulness. The $\beta$ coefficient indicates here that when the score in state mindfulness increases one unit, the resourcefulness score increases 0.097 units. The linear equation which represents this effect is as follows: resourcefulness = 0.097 * mindfulness. This relationship (possibly significant in greater samples) posits that the higher individuals are in state mindfulness, the greater is their feeling of having abundant personal resources.

![Conceptual model with regression coefficients (Own depiction).](image)

**Figure 9**: Conceptual model with regression coefficients (Own depiction).

*Direct Effect of Mindfulness on Sustainable Consumption*

As outlined before, the mediation analysis helps determine the values of the different coefficients that compose the effects proposed in our model. In particular, it is valuable to evaluate and discuss the direct effect of mindfulness on sustainable consumption. This will further inform the testing of Hypothesis 1. Table 13 shows the direct positive effect of mindfulness on sustainable consumption (represented by parameter ‘d’ in Table 12). This positive relationship may indicate that people who experience higher levels of state mindfulness, will also show higher levels of sustainable consumption. However, this relationship is not statistically significant since the p-value is too high ($\beta = 0.014; z = 0.11; p = 0.913$).
In conclusion, no statistically significant effect of state mindfulness on sustainable consumption was found. However, according to some schools of thought, this is not a problem preventing us from moving forward with the mediation analysis since just as correlation does not prove causation, no correlation does not disprove causation (Hayes, 2017). Therefore, the mediation analysis could be continued by first studying the mediation effect of resourcefulness on the relationship between mindfulness and sustainable consumption.

First Mediation: Resourcefulness

This will allow us to test Hypothesis 3. Table 14 shows the effect of this mediation. Although the effect of state mindfulness on resourcefulness is positive (parameter ‘a’), the effect of resourcefulness on sustainable consumption is negative (parameter ‘f’). Therefore, the combined effect of the mediation is negative ($\beta = -0.006$; $z = -0.301$; $p = 0.764$; $R^2 = 0.026$). This seems to indicate that when state mindfulness increases, so does resourcefulness. However, through resourcefulness, the effect turns around to become negative. Then, the more resourceful people are thanks to the state mindfulness effect, the less sustainable choices they make. Besides, the $R^2$-value indicates that 2.6% of the scores of sustainable consumption are explained by the effect of this first mediation. However, none of these results are statistically significant since the $p$-values are very high.
Second Mediation: Prosocial Tendency

The second proposed mediation predicts a mediating role of prosocial tendency on the relationship between mindfulness and sustainable consumption. Analyzing this allows for the testing of Hypothesis 5. The results for this mediation are presented in Table 15. On the one hand, Table 15 shows a positive regression coefficient between mindfulness and prosocial tendency (parameter ‘e’), meaning that when the score in state mindfulness increases one unit, the score in prosocial tendency would increase 0.05 units. However, since the PTM is negatively phrased, this effect suggests that individuals higher in state mindfulness tend to behave less prosocially. On the other hand, Table 15 also shows a positive regression coefficient between prosocial tendency and sustainable consumption (parameter ‘c’). Due to the phrasing of the PTM, this coefficient would indicate that the less prosocial tendency people show, the more sustainable choices they would make. Finally, although the individual effect of mindfulness on prosocial tendency and the effect of prosocial tendency on sustainable consumption did not result as expected, the combined mediation effect would be positive because both individual effects would compensate each other ($\beta = 0.008; z = 0.508; p = 0.611; R^2 = 0.024$). In case of statistically significant results, this would suggest that the higher individuals are in state mindfulness, the more sustainable choices they would make thanks to the effect of prosocial tendency. However, none of these results is significant since the p-values are rather high. Finally, the $R^2$-value indicates that 2.4% of the scores of sustainable consumption are explained by the effect of this second mediation.
Finally, after investigating the effect of the two mediators individually, we now examine the combined effect of both mediators at the same time, which will provide the necessary insight for Hypothesis 6. Table 16 shows the individual parameters composing this serial mediation (a, b, and c) and the total effect of the serial mediation, while Figure 10 illustrates these results. None of these results are statistically significant because the p-values for all the effects are quite high. Nonetheless, the regression coefficients between them are studied and their effects are analyzed. As explained before, there is a positive regression coefficient between mindfulness and resourcefulness (a). Also, a positive regression coefficient between prosocial tendency and sustainable consumption (c) was found, which would indicate that the higher individuals’ prosocial tendency is, the less sustainable choices they would make (remember negatively phrased PTM). Additionally, the effect of resourcefulness on prosocial tendency (b) is studied here. Table 16 indicates that this regression coefficient is negative which would imply that higher scores in resourcefulness would lead to lower scores in prosocial tendency. In other words, the higher individuals perceive their abundance of personal resources, the more they tend to behave prosocially (since the PTM is negatively phrased). After the analysis of these three individual effects, the serial mediation effect can now be investigated. Table 16 shows that this serial mediation regression coefficient is negative (β = -0.002; z = -0.532; p = 0.595; R² = 0.008) which would mean that higher levels of state mindfulness reduce the individuals’ sustainable choices through the serial mediation of resourcefulness and prosocial tendency. However, the effect is very small with β = -0.002. Again, these interpretations are not scientifically substantiated because no

| Parameters                        | β     | Std. Error | z - value | P(>|z|) | R²   |
|-----------------------------------|-------|------------|-----------|---------|------|
| c = Effect of PT on SC            | 0.157 | 0.240      | 0.652     | 0.514   | -    |
| e = Effect of M on PT             | 0.050 | 0.061      | 0.812     | 0.417   | -    |
| Effect Mediation 2 (e*c)          | 0.008 | 0.015      | 0.508     | 0.611   | 0.024|

Note. PT refers to Prosocial Tendency; SC to Sustainable Consumption; and M to State Mindfulness. R² refers to the coefficient of determination R-Squared.

Table 15: Second mediation effect on sustainable consumption (Own depiction).

Serial Mediation Effect
statistical significance was found. Besides, the $R^2$-value indicates that 0.08% of the scores given to sustainable consumption are explained by the effect of this serial mediation.

| Parameters                  | $\beta$ | Std. Error | z-value | $P(>|z|)$ |
|-----------------------------|---------|------------|---------|-----------|
| $a =$ Effect of M on R      | 0.097   | 0.068      | 1.431   | 0.152     |-
| $b =$ Effect of R on PT     | -0.123  | 0.102      | -1.200  | 0.230     |-
| $c =$ Effect of PT on SC    | 0.157   | 0.240      | 0.652   | 0.514     |-
| Serial Mediation Effect R&P $a*b*c$ | -0.002  | 0.004      | -0.532  | 0.595     | 0.008

Note. M refers to State Mindfulness; R to Resourcefulness; PT to Prosocial Tendency; and SC to Sustainable Consumption. $R^2$ refers to the coefficient of determination R-Squared.

Table 16: Serial mediation effect on sustainable consumption (Own depiction).

![Conceptual model with individual and serial mediation effects](image)

Figure 10: Conceptual model with individual and serial mediation effects (Own depiction).

7.3 Hypothesis Testing

In this last part of this chapter, all the results obtained from the data analysis are put together to test the six hypotheses of our conceptual model.

Hypothesis 1 states that meditative state mindfulness is positively related to sustainable consumption. Thus, in our experiment we expect that the members of the LKM group are more
likely to make sustainable consumption decisions. To test this contention, the behavioral intention to consume sustainably was studied for participants in both experimental groups. As earlier shown in Table 7, a statistically significant difference was found between the groups (MLkm = 0.25, SD = 1.03; MControl = 0.71, SD = 1.05; t (74) = -1.88; p = 0.064; d = -0.43). Since the t-value is negative, these results show that the control group made more sustainable decisions than the LKM group. However, despite this significant difference between groups, this finding does not explain the direct relationship between state mindfulness and sustainable consumption because it may have been influenced by other variables. Therefore, we carried out a correlation test, which indicates a weak but not significantly positive correlation between state mindfulness and sustainable consumption (r = 0.01, p = 0.92). Finally, for a more holistic understanding of the effect of state mindfulness on sustainable consumption, we performed a serial mediation analysis which also allowed us to study the direct effect of state mindfulness on sustainable consumption as was previously shown in Table 13. With this analysis, Hypothesis 1 can be tested and as expected by the result of the correlation test, a poor and non-significant positive relationship between mindfulness and sustainable consumption was found (β = 0.014; z = 0.11; p = 0.91). Consequently, there is no support for Hypothesis 1.

**Hypothesis 2** suggests that meditative state mindfulness increases resourcefulness. To test this, we needed to assess whether the participants in the LKM group feel more abundant in personal resources after being guided through the LKM session. For the analysis, some statistical tests were performed using the resourcefulness scores obtained with the scale by Levontin et al. (2014). As previously seen, the results in Table 7 show that there is no statistically significant difference between the two experimental groups in terms of resourcefulness (MLkm = 3.66, SD = 0.49; MControl = 3.86, SD = 0.62; t (74) = -1.56; p = 0.123; d = -0.36). Moreover, the performed correlation test between mindfulness and resourcefulness showed a positive but not significant correlation between the variables (r = 0.16, p = 0.16). Finally, the serial mediation analysis revealed that the effect of state mindfulness on resourcefulness is positive but not significant (β = 0.097; z = 1.431; p = 0.152). Therefore, these findings do not support Hypothesis 2.

**Hypothesis 3** states that the relationship between meditative state mindfulness and sustainable consumption is mediated by resourcefulness. In order to test this hypothesis, we
analyzed the data provided by the mediation analysis. No statistically significant results were found which support the mediation between these variables. Nonetheless, the regression coefficients between them were studied and their effects were analyzed. Table 14 shows that although the regression coefficient between mindfulness and resourcefulness was positive, the regression coefficient between resourcefulness and sustainable consumption was negative. Therefore, the total regression coefficient of the first mediation is negative ($\beta = -0.006; z = -0.301; p = 0.64; R^2 = 0.026$), which would indicate that even though meditative mindfulness would increase resourcefulness, this effect would be compromised by the negative effect of resourcefulness on sustainable consumption. Consequently, the effect of the resourcefulness mediation would be as follows: the higher individuals are in state mindfulness, the less sustainable choices they make due to the negative mediating effect of resourcefulness. However, these findings are also weak and not statistically significant, thereby not supporting Hypothesis 3.

**Hypothesis 4** proposes that meditative state mindfulness increases prosocial tendency. To analyze this, it is important to explore whether the participants in the LKM group tend to behave more prosocially after following the meditation session in the experiment. Some statistical tests were performed using the indicated scores of the PTM. As presented before in Table 7, no statistically significant difference between the two experimental groups in terms of prosocial tendency was found ($M_{Lkm} = 1.58, SD = 0.49; M_{Control} = 1.54, SD = 0.52; t(74) = 0.41; p = 0.69; d = 0.09$). Moreover, the performed correlation test between mindfulness and prosocial tendency showed a positive but not significant correlation between the variables ($r = 0.07, p = 0.54$). Finally, the serial mediation analysis shows that the effect of state mindfulness on prosocial tendency is positive but not significant ($\beta = 0.050; z = 0.812; p = 0.417$). Thus, this result cannot support Hypothesis 4.

**Hypothesis 5** states that the relationship between meditative state mindfulness and sustainable consumption is mediated by prosocial tendency. To test this hypothesis, we interpreted the data from the mediation analysis. Table 15 shows that both the regression coefficient between mindfulness and prosocial tendency and the regression coefficient between prosocial tendency and sustainable consumption are positive. Therefore, the total regression coefficient of the second mediation was also positive ($\beta = 0.008; z = 0.508; p = 0.611; R^2 = 0.024$), meaning that although
state mindfulness would reduce prosocial tendency (with negatively phrased PTM), this effect would be countered by the positive effect of prosocial tendency on sustainable consumption. Consequently, the effect of the prosocial tendency mediation would be the following: the higher individuals are in state mindfulness, the more sustainable choices they make due to the positive mediating effect of prosocial tendency. However, these findings are also weak and not statistically significant and therefore fail to support Hypothesis 5.

**Hypothesis 6** posits that the relationship between meditative state mindfulness and sustainable consumption is serially mediated by resourcefulness and prosocial tendencies. The results of the serial mediation analysis provide the necessary insight to test this contention. Table 16 shows that while both the regression coefficient between mindfulness and resourcefulness and the regression coefficient between prosocial tendency and sustainable consumption are positive, the regression coefficient between resourcefulness and prosocial tendency is negative. Therefore, the total regression coefficient of the serial mediation would also be negative ($\beta = -0.002; z = -0.532; p = 0.595; R^2 = 0.008$), meaning that even though the second mediation of prosocial tendency would increase the sustainable choices of individuals, this effect would be compromised by the first mediation of resourcefulness. Consequently, the effect of meditative state mindfulness on sustainable consumption mediated by resourcefulness and prosocial tendency would show that the higher people are in state mindfulness, the less sustainable choices they make due to the negative serially mediating effect of resourcefulness and prosocial tendency. However, these findings are weak and not statistically significant, and thereby not sufficient to provide support for Hypothesis 6.

**D. DISCUSSION AND CONCLUSIONS**

The last part of this thesis is dedicated to the final discussion of our research findings and to some concluding reflections on the theoretical contributions and the managerial implications of the present study. Eventually, an outline of the shortcomings and limitations of this research is presented from which valuable impulses and avenues for future research are derived.
8. General Discussion

In this chapter, the findings of this study will be discussed based on the data analyses performed in the previous chapter. Following this, the research question will be answered.

The present study investigated the effect of state mindfulness on sustainable consumption. Based on existing research, it was expected that the more mindful people are, the more sustainable choices they will make, and this contention built the foundation of this study (Geiger et al., 2019). However, we desired to go a step further and examine the drivers of the relationship between these two variables. Initial empirical evidence gives rise to the idea that a sense of resourcefulness and prosocial tendencies have an impact on state mindfulness which in turn influences sustainable consumption (Orazi et al., 2021; Barbaro & Pickett, 2016; Panno et al., 2018). Therefore, this research was extended by introducing these two variables as mediators with the aim of studying their effect on the relationship between state mindfulness and sustainable consumption. Consequently, the following research question was formulated:

“How does meditative state mindfulness impact consumers’ sustainable consumption decisions and how is this relation influenced by and related to the cultivation of a heightened sense of resourcefulness and a tendency to behave prosocially?”

In order to find answers to this research question and to test the hypotheses of the conceptual model, a variety of descriptive and inferential statistical analyses was carried out, the findings of which will be presented as follows.

First, we performed a descriptive analysis of the total population sample and of the participants in each of the experimental groups to make sure that they are large enough to perform the analyses with sufficient statistical power. In the final sample, 34 participants were in the LKM group and 42 participants in the active control group which was an appropriate amount for a between-group comparison.

Second, the control variables were examined to ensure that the experimental groups are comparable in terms of gender, age, education, monthly income, and trait mindfulness. In order to
do so, we faced a challenge in choosing the correct statistical tests. This challenge is based on the fact that, when designing the experiment, we wanted to guarantee ethical correctness by not forcing participants into answering questions about potentially sensitive, demographic data. Therefore, we added the option “Prefer not to say” to all the demographic control variables, and also the option “Non-binary / third gender” to the gender variable.

After the experiment, this ethical decision turned out to be counterproductive for the data analysis process because it changed the variables to non-ordinal forms of data and thereby, they did not meet the requirement for performing the between-group comparison tests anymore. Further, it should be highlighted that the age variable is considered as an ordinal variable because age groups were used for data collection to minimize participants’ effort and response time. However, during the data analysis process, we realized that this was a disadvantage because the continuity of this variable was lost which would have yielded more precise results. Therefore, to solve this analytical issue with the control variables, we decided to remove the participants who chose the problematic option in the analysis of each of the affected variables. This way, we could use the statistical tests to compare both experimental groups in terms of the control variables, despite the present issue. Subsequently, a Chi-Square test was performed for gender, a Mann-Whitney U test for age, education, and monthly income, and a Student’s t-test for trait mindfulness. For age, no data was neglected because no participant chose the “Prefer not to say” answer. For gender, education, and monthly income, it is important to note that a few less than 76 participants were included in the tests.

The results of the performed statistical tests show that there were no differences between groups in terms of gender, education, monthly income, and trait mindfulness. However, a statistically significant difference in age between the groups was found. To ensure the comparability of both groups, we needed to examine this control variable further, investigate whether age was correlated with any other variable, and discard the possible effect of age on sustainable consumption. The result of the Pearson’s correlation coefficient analysis and the linear regression analysis with age show that age was not significantly correlated with any of the studied variables and that it did not have any effect on sustainable consumption. Therefore, we concluded that both groups were comparable in terms of demographics.
Third, we investigated the differences between groups for the studied variables. For this, we applied the Student’s t-test because the studied variables were continuous. We found a significant difference in terms of the manipulation check (state mindfulness) which reveals that the LKM group was more focused on their breathing and their bodies than the control group. This finding was expected because it demonstrates that participants of the treatment group were attentively following the LKM audio which then, as intended, resulted in a higher state of mindfulness. Moreover, no statistically significant differences between groups in terms of resourcefulness or prosocial tendency were found. This result was surprising because extant research suggests that mindfulness can increase individuals’ feeling of possessing more personal resources which in turn leads to more other-focused behaviors (Orazi et al., 2021). Furthermore, we found a significant difference between groups in terms of sustainable consumption. The results reveal that the control group made more sustainable choices than the LKM group. This finding was not expected, because our conceptual model predicted that the LKM group will make more sustainable decisions compared to the active control group because they were positively influenced by a higher state of mindfulness due to the meditation intervention. It is possible that the TedTalk audio recording which was assigned to the members of the active control group was not purely informational but also motivational and/or inspiring for the participants which may have contributed to the present result. Further research is needed to test this contention.

Fourth, we investigated the correlations between the studied variables to determine the relationships between all of them. Additionally, a correlation analysis for the trait mindfulness variable was performed. Although this control variable is not part of our conceptual model and its analysis will not provide any insight for the hypothesis testing, it is believed that it could provide some interesting directions for further research instead. The Pearson’s correlation coefficient test showed that there were no significant correlations between the studied variables in our conceptual model. However, the relationship between state mindfulness and resourcefulness was almost marginally significant (p = 0.16). This may imply that, despite the correlation between these variables being non-significant in this study, it may become significant in future studies with larger sample sizes. We call for further research here to test and support this implication. Confirming this correlation with statistical significance would constitute empirical evidence for the notion that the
higher individuals are in a state of mindfulness, the more plentiful in personal resources they will feel. This finding would be an invaluable contribution to the field of mindfulness and sustainable consumption research because it may advance existing knowledge and establish resourcefulness as a new pathway from mindfulness to sustainable consumption (Orazi et al., 2021; Levontin et al., 2015; Geiger et al., 2019).

Moreover, the analysis of trait mindfulness demonstrated a significant negative correlation between trait mindfulness and state mindfulness. This means that individuals who show higher levels of trait mindfulness, have increased levels of state mindfulness (due to the negatively phrased adapted MAAS scale). This finding may motivate further research because, although the present study focused on mindfulness as a state instead of a trait, we discovered that trait mindfulness may also influence individuals’ state mindfulness. This relationship is also in line with existing research and its further investigation especially in relation to sustainable consumption research is encouraged (Kiken et al., 2015). Finally, we found a significant and positive correlation between trait mindfulness and prosocial tendency. Since both scales were negatively phrased, this finding shows that individuals’ levels of trait mindfulness positively influence their prosocial tendencies. Trait mindfulness appears to have a positive effect on individuals and helps them become more prosocial and caring about others.

Fifth the conceptual model of the present study is composed of two simple mediations and one serial mediation. Therefore, a serial meditation analysis was performed to measure all different relationships between the variables of the model and to test its hypotheses. As already expected by the results of the Pearson’s correlation coefficient analysis, we did not find any significant individual effect of any of the independent variables on sustainable consumption. However, the analysis was continued to evaluate whether the two simple mediations, resourcefulness and prosocial tendency, could become significant and provide some valuable insights. Although we did not find any significant outcome in these simple mediations, our results give rise to the assumption that the more individuals are in a mindful state, the more sustainable choices they may make thanks to the positive mediating effect of prosocial tendency. However, this effect is not statistically significant and future research is warranted to further explore this assumption. Finally, the result obtained from the serial mediation analysis was surprising. Against the expectations, the finding
suggests that a more mindful state reduces individuals’ sustainable choices through the serial mediation of resourcefulness and prosocial tendency. However, it is important to emphasize that this finding was not statistically significant, and we call for further research with bigger samples and more controlled experimental environments to shed more light onto this proposed serial mediation. More details and reflections on this will be discussed in the final chapter.

To sum up the results of the present research, we conclude that all six hypotheses need to be rejected because the data analysis did not provide any supporting and significant findings. However, Hypothesis 2 showed the expected directional result but without statistical significance. It is assumed that this hypothesis may be more easily accepted with a larger sample. Nevertheless, we acknowledge that the results of the current study have been heavily affected by the fact that the experiment could not take place in a controlled research lab and thus, making it difficult to ensure that the participants followed all the instructions as intended. This weakness will be explained in more depth in the chapter dedicated to limitations and future research.

While we would have preferred generating significant empirical evidence with this study, we want to highlight two potential reasons for the null result of the present research by drawing on discussions from previous chapters. First, Rosenkranz et al. (2019) noted that when using active control groups, which is crucial for more scientific rigor in mindfulness-based intervention studies, both the treatment and the control group frequently show similarly improved results because often there may not only be one single way to reach the same goal. This means in our research context, that not only the meditation may lead to more sustainable consumption but also listening to an inspiring story about mindfulness may encourage people to behave more sustainably. It is likely that applying a waitlist or no treatment control condition in this study would have yielded more significant results, but this approach clearly would have compromised the scientific rigor of this research, which is a compromise we were not willing to accept A second potential explanation for our findings is provided by Geiger et al. (2020) who also reported null results regarding any direct positive effects of mindfulness on sustainable consumption, related attitudes, or the attitude-behavior gap. Although they ran a longitudinal study, they concluded that mindfulness-based interventions may need to be implemented over the course of weeks or even months to have actual effects on consumer behavior. This argument will be further explored in the final chapter.
9. Theoretical Contributions

In this chapter, the theoretical contributions of our study are explained, and the findings of the present research are contrasted with related studies and embedded within the field of research on mindfulness and sustainable consumption.

As highlighted previously in the literature review, the concept of mindfulness and its effects on individuals have been researched for several decades now. However, investigating the association of mindfulness with more sustainable patterns of consumption is a rather new academic endeavor. Fischer et al. (2017) and Geiger et al. (2019) published two literature reviews on this research area relating mindfulness to sustainable consumption and they both conclude that the quality of many existing studies is impaired by major methodological issues. According to the authors, robust empirical evidence is still missing and, therefore, they call for further research in this field which is based on randomized-controlled studies and integrates active control groups. In recognition of this gap in the literature, our study contributes to the current body of research in mindfulness and sustainable consumption by applying the much sought-after methodological approach of a randomized-controlled experiment with an active control group. Interestingly, in line with the findings of the intervention study by Geiger et al. (2020), we equally found no statistically significant evidence for a direct effect of mindfulness on sustainable consumption. Instead – although missing statistical significance – our results rather support the claim that mindfulness practice has a positive indirect effect on sustainable consumption in the long run through the variable of prosocial tendency as was tested within this study.

Moreover, to the best of our knowledge, Orazi et al. (2021) were the first to publish an academic article studying resourcefulness as a mediating variable of the effect of mindfulness on other-focused ethical behaviors. As established in the discussion of the extant literature, sustainable consumption may also class as a form of prosocial, other-focused behavior. Thus, similar to the effect found by Orazi et al. (2021), we assumed that resourcefulness mediates the relationship between mindfulness and sustainable consumption. In this context, our theoretical contribution to research is two-fold. First, we further give academic attention to the promising, yet little empirically explored role of the variable of resourcefulness in mindfulness research. We propose
that it should be incorporated as a new pathway from mindfulness to sustainable consumption in future research. Second, we included an active control condition into our intervention study and advance the work by Orazi et al. (2021) by counteracting their methodological problem of not using an active control condition in some parts of their studies.

Another theoretical contribution of the current research lies in our observation that from the four prevalent mechanisms by which mindfulness enhances sustainable consumption, the pathway of prosocial behavior and connectedness has received the least academic attention so far compared to the other pathways of disruption of routines, congruence of attitudes and behavior, and non-materialism and well-being (Geiger et al., 2019). Considering the fact that humans have an innate tendency to behave prosocially for evolutionary reasons, we deemed it especially intriguing to include and investigate the variable of prosocial tendency in our research model (Tomasello, 2014). Our study thereby counteracts the lack of research in this specific area by advancing insight into prosocial behavior as a pathway from mindfulness to sustainable consumption.

Finally, although this study cannot support the claim that state mindfulness increases prosociality like Orazi et al. (2021) did, we have found a positive significant correlation between trait mindfulness and prosocial tendency instead. In other words, the higher individuals score in trait mindfulness, the more they tend to behave prosocially. According to Orazi et al. (2021), state mindfulness is what leads individuals to behave in more other-focused ways. However, the result of the present study gives rise to the idea that not only mindfulness as a state has the potential to positively influence prosocial tendency and behaviors but also mindfulness as trait-like propensity. Consequently, this study contributes to the literature by expanding the current knowledge on the effect of the different forms of mindfulness on prosocial tendency. We spark new ideas for future research which is called on to explore the different effects of state and trait mindfulness on prosocial tendency and ultimately, on sustainable consumption.

10. Managerial Implications

Despite the lack of empirical evidence due to the missing statistical significance, one of the findings of our study nevertheless has the potential to reveal some important practical implications
for public policy makers and business managers which are addressed within this chapter. These implications are first and foremost concerned with the relevant role that mindfulness may play in advancing sustainable development and reaching sustainability-related goals.

In the literature review, we have discussed the different psychological factors of the SHIFT framework which can promote sustainable consumption and are targeted by policy makers and marketers to effectively guide individuals toward more environmentally friendly behaviors (see White et al., 2019a). Moreover, we have also argued for adding mindfulness to this framework by positioning it on top of the other five factors. Our discussion made clear that while the existing SHIFT factors can be quite easily influenced by external forces, the impact of interventions geared toward these factors can be limited by the individuals’ susceptibility to them.

Mindfulness, on the other hand, can be encouraged externally but it is much more of an inside job and more controlled by the individual who chooses whether to practice it. In addition, there is reason to believe that the effects of mindfulness can reach far deeper and are more successful in tapping into internal systems of beliefs, values, and attitudes and bringing about desired, sustainable shifts in behavior compared to external stimuli.

This notion is supported by Ives et al. (2020) who claimed very recently that sustainability research needs to shift its focus from the external environment to people’s inner worlds which contain their thoughts, beliefs, feelings, and identities. This is because “these lie at the heart of actions for sustainability, and have powerful transformative capacity for system change” (Ives et al., 2020, p. 208). The authors emphasize that the real environmental issues today are in fact personal characteristics like selfishness, greed, and apathy and that sustainability can be significantly promoted by paying more attention to people’s inner worlds and cultivating characteristics such as compassion, empathy, and generosity which are in themselves expressions of sustainability (Ives et al., 2020).

In line with initial empirical evidence by Orazi et al. (2021) on the construct of resourcefulness, we found a positive effect of mindfulness on individuals’ perception of their inner resources with a p-value close to marginal statistical significance. This may indicate that
contemplative practices like meditative mindfulness benefit people’s inner worlds by replenishing their personal resources which are, in turn, required for overcoming challenges of sustainability (Ives et al., 2020).

Clearly, further research in this area is warranted to put forth significant and more robust results supporting the implications that we derived from our research. However, we hope that the correlational tendency, which our findings suggests, is indicative of how important and powerful the impact of mindfulness on our inner worlds and ultimately on our sustainable consumption decisions is. Further, we hope that this is demonstrative to such an extent that our study contributes to raising sufficient awareness and making governments and businesses take mindfulness into account when designing policies, strategies, or new market offerings especially in the pursuit of sustainability-related goals.

At this point, we also want to highlight again that for fundamental change toward more sustainability, governments, businesses, and consumers alike need to enter a dialogue and actively collaborate – as Ives et al. (2019, p. 212) point out “any exploration of inner worlds within sustainability science must be done in conjunction with analysis of institutional structures, social context and politics.”

Hence, governmental policy makers and other institutions working toward sustainability may consider the promotion and diffusion of mindfulness-based programs. Entrepreneurs, who run businesses driven by sustainability goals, may want to offer similar trainings directly to their employees and also encourage their customers to become engaged in mindfulness practice by educating them about the benefits and how-to’s of meditation through their marketing communications. Instead of merely instrumentalizing the psychological factors of the SHIFT framework as some sort of external manipulation aimed at driving people’s engagement in more sustainable lifestyles, setting up mindfulness-based trainings and programs appears to be a much more genuine and authentic approach to both contribute to people’s general well-being but also to their mindset shift back toward their innate prosocial tendency and toward more sustainability-conform behaviors. Eventually, it can be predicted that this will lead to improved and persistent
levels in sustainable consumption, thereby resulting in the attainment of sustainability goals and further growth of sustainability-concerned businesses.

11. Limitations and Future Research

Although our research shines some more light on the link between mindfulness and sustainable consumption and how the construct of resourcefulness and prosocial tendency are related to it, our study comes with its weaknesses. Thus, in this concluding chapter of the thesis, the limitations of our research are outlined and recommendations for further research are provided.

First, the realization of this project during strict pandemic-related contact restrictions puts a major limitation to our data collection process and therefore also to the quality of our final sample data. Although it would have been required due to the experimental character of our study, we were not granted access to a controlled research lab environment to conduct our research and could therefore only take approximate and limited measures to control and rule out any confounding factors. We were bound to imitate a similar experience for our participants in a fully remote and digital setting. Despite giving very detailed instructions throughout the online experiment, especially regarding the audio intervention, and implementing a rather strict data cleaning process considering the participants’ survey processing times, which led us to remove 82 responses from our data set, we acknowledge that our research could have yielded more significant and better results if it was conducted in the more controllable environment of an offline research lab. Thus, future research is encouraged to use our research design, replicate the study in this alternative setting, and recruit a larger, high-quality sample.

Second and associated with the first limitation, a major shortcoming of our research lies within its external and internal validity. The internal validity of the present research is compromised primarily by the resource and time limitations which determine the scope of this thesis. As already addressed in chapter 6, our measurement validity and reliability are limited because there was no room in our project timeline for running a pre-test to validate the decision-making task manipulations before the actual experiment or for conducting background interviews to make more informed decisions regarding the adaptation of the MAAS scale. Advancing this
research approach with more extensive resources in the future is expected to result in more robust data and trustworthy empirical outcomes.

Moreover, due to the cross-sectional design of the present study, our findings are strictly correlational in nature, and we cannot make any claims about the causality of the proposed relationships. We recognize that this compromises the internal validity of our study and it is crucial that future research verifies our suggested correlational model with longitudinal, experimental studies which are better designed to support causal conclusions by accounting for temporality. Further research is also required to determine causation in the relationships of (1) mindfulness and resourcefulness and (2) resourcefulness and prosocial tendency.

The external validity of this study is limited by the size and dominant characteristics of our final sample. Despite the sample size being sufficient for a group comparison study from a statistical analysis perspective, it is still rather small for the research findings to be generalized to the larger population. In a similar vein, the majority of our sample belongs to a quite specific demographic group (that is, female, Spanish students and young professionals) which is why the population generalizability of our results to people of a more diverse demographic is unknown. Thus, replicating this study in the future with a substantially larger sample size is recommended to increase external validity. Moreover, the context generalizability is limited because the present research only investigated the effect of mindfulness on sustainable consumption measured as the intention to make a sustainable everyday consumer good purchase. Generalizing the findings of this study to other forms of sustainable consumption which can be encountered in many different areas of life including mobility, housing, nutrition, and clothing may be risky. Instead, future research should examine a variety of sustainable consumption behaviors in this research context to reveal whether the proposed relationships exist for any type of sustainable consumption. Additionally, in this external context, it should also be noted that the present research lacks ecological validity. We are aware that especially considering the decision-making task in which the participants had to indicate their buying intention for products manipulated with sustainable and premium cues, people were exposed to a purely hypothetical scenario and did not actually make a purchasing choice. In a real-life setting, for example in a supermarket, people are exposed to many choices at once and there is a myriad of other environmental factors which influence their
decision-making. Improving ecological validity by observing the participants’ actual behavior in field experiments and applying neuroscientific methods like neuroimaging or eye-tracking to retrace their decision-making processes, is very likely to advance the current research.

Third, the results of the inferential data analysis regarding the control variables in this study need to be interpreted with caution. Due to ethical considerations and political correctness, we gave our participants the option to answer “Prefer not to say” when they were asked about their demographic data. Related to gender, they were additionally able to identify themselves as “Non-binary / third gender”. However, providing these options for the control variables constrains our research from a data analysis perspective because they do not meet the criteria required to perform the appropriate statistical tests and thus, make it impossible to statistically analyze potential differences between the two experimental groups. Only few participants in the final sample have selected the problematic options for gender, education, and income levels. This is why we decided to perform the statistical tests anyway, neglecting the affected data points, to receive approximate information for the group comparison. However, we acknowledge and emphasize that the statistical tests regarding the control variables gender, education, and income levels are skewed due to this issue, and future research is called on to explore how demographic control variables can be included in surveys complying both with ethical correctness and the requirements for conflict-free statistical data analysis.

Next, we still believe that a loving-kindness meditation was particularly suitable for the mindfulness intervention in the context of our research question compared to more generic practices like focused attention or open monitoring meditation. This contention is also supported by prior and closely related research, in which the use of LKM yielded interesting and significant empirical findings (Engel et al., 2020; Logie & Frewen, 2015). However, it should be noted that LKM is sometimes classified as a more challenging meditation technique because it includes a variety of thoughts and visualizations (Fredrickson et al., 2008; Aspy & Proeve, 2017). Following a guided LKM session of just above ten minutes can thus feel overwhelming or difficult for meditation beginners without much experience as we recruited them for this study. This fact may put a further limitation onto the present research. For investigating the effect of a single meditation session, an even briefer and simpler mindfulness meditation focusing on the breath could
potentially have been easier to follow for our participants in the treatment group and it is possible that this would have resulted in higher effects induced by the meditation intervention. Replacing the LKM with a more beginner-friendly and shorter FAM in further research could test this prediction and contribute to a more fruitful discussion about the adequacy of LKM practices for exploring the effect of one-time, short meditation interventions within the field of mindfulness research.

Lastly, we recognize that merely practicing one single meditation session does not reflect the traditional teachings of meditative mindfulness which promote a long-term dedication and continued practice of meditation (Aspy & Proeve, 2017). According to Kabat-Zinn (2005), novice meditators often encounter feelings of restlessness and doubt when they start their meditation journey and only feel the benefits and positive effects of their practice after the first weeks when they are more familiar and comfortable with the techniques, thereby overcoming the initial obstacles. With its one-time, short meditation intervention, the present study is limited by this fact and it remains an open question whether repeated LKM practice would show more significant effects in our research context. Just like we have highlighted that behavioral change toward enhanced sustainable lifestyles and the establishment of new sustainable habits occurs only over time, it is likely that a more extensive LKM program with regular guided meditation sessions followed over a longer timeframe will be much more powerful than just one single session (Geiger et al., 2019). It is claimed that LKM is the type of meditation which “changes the way people approach life” (Fredrickson et al., 2008, p. 1058) and if this holds true, LKM may be key toward more sustainable development. From this perspective, we highly encourage future research to modify and advance our study design by developing a guided LKM program which runs over the course of a few weeks or even months. Implementing this training for the treatment group and using an appropriate active control group will also answer the call for more longitudinal intervention designs in the research area linking mindfulness and sustainable consumption which could not been realized within the scope of this thesis (Geiger et al., 2019; Fischer et al., 2017).

In conclusion, this thesis contributes to shining more light on the highly relevant topics of mindfulness and sustainability in contemporary research which further informs practice about how to best foster more sustainable development. Existing research has established the effectiveness of
different mechanisms by which the practice of mindfulness can promote more sustainable lifestyles and this project takes another step toward more insight into those pathways by investigating the role of resourcefulness and prosocial tendency. We acknowledge the lack of empirical evidence resulting from the current study which is mainly due to the limited scope and resources as well as the pandemic-related conditions under which this project was realized. However, by further exploring our research question and our methodological design adapted in line with the suggestions made for further research, we are convinced that our approach has the potential to make powerful advancements in this specific field of research with implications that will ultimately contribute to higher well-being of both people and the planet.
References


Appendix A: Qualtrics survey with questions and survey flow (Own depiction).

Start of Block: Cover Story

Dear participant,

Thank you for supporting our master thesis and welcome to our online experiment. The experiment will take about **20 minutes**. It includes a YouTube audio recording to follow along and is designed to study consumer memory. Your participation is fully voluntary and anonymous.

All responses will be coded and contribute to aggregated data of the research team. We ensure that all the collected information will be kept confidential at all times and your anonymized responses will solely be used for the purpose of our research. By moving forward and answering the questions, you agree that you have read and understood the nature of the research as described above and are providing your informed consent to participate in the research.

**Please make sure to find a quiet and undisturbed place and have your headphones ready before you proceed.**

We encourage you to read the questions carefully and answer intuitively, there is no right or wrong answer.

Q1 Do you have a regular meditation practice (daily or 3-4 times per week)?

○ Yes

○ No

End of Block: Cover Story

Start of Block: Control: Trait Mindfulness

Q2 Below is a collection of statements about your everyday experience as a consumer. Please indicate how frequently or infrequently you currently have each of the experiences, using the scale from 1 (= almost never) to 5 (= almost always).

Please answer to what really reflects your experience rather than what you think your experience should be.
In my role as a consumer...

| I could be experiencing some emotion and not be conscious of it until some time later. | Almost never (1) | Rarely (2) | Sometimes (3) | Often (4) | Almost always (5) |
| I tend to walk quickly to get where I’m going without paying attention to what I experience along the way. | ○ | ○ | ○ | ○ | ○ |
| It seems I am “running on automatic” without much awareness of what I’m doing. | ○ | ○ | ○ | ○ | ○ |
| I rush through activities without being really attentive to them. | ○ | ○ | ○ | ○ | ○ |
| I find myself listening to someone with one ear, doing something else at the same time. | ○ | ○ | ○ | ○ | ○ |
| I find myself preoccupied with the future or the past. | ○ | ○ | ○ | ○ | ○ |

End of Block: Control: Trait Mindfulness

Start of Block: Experimental Manipulation 1

Please put on your headphones now and when you're ready, click the blue "play" button below.

It is important that you carefully follow the entire audio recording before moving on to the next part of the experiment.

Research Study · Audio 1 (LKM treatment condition)

Q3 Please tick below to confirm that you are ready to proceed.

○ Yes, I finished listening to the entire audio recording.

End of Block: Experimental Manipulation 1
Start of Block: Experimental Manipulation 2

Please put on your headphones now and when you're ready, **click the blue "play" button** below.

It is important that you carefully **follow the entire audio recording** before moving on to the next part of the experiment.

**Research Study · Audio 2 (TedTalk control condition)**

Q4 Please click below to confirm that you are ready to proceed.

- Yes, I finished listening to the entire audio recording.

End of Block: Experimental Manipulation 2

Start of Block: Manipulation Check

Q5 Please indicate to what extent the following statements reflect your experience during the audio recording, using the scale from 1 (= not at all) to 5 (= extremely).

<table>
<thead>
<tr>
<th></th>
<th>Not at all (1)</th>
<th>Slightly (2)</th>
<th>Somewhat (3)</th>
<th>Moderately (4)</th>
<th>Extremely (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was focusing on my breathing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was focusing on the physical sensation of breathing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt in touch with my body.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Block: Manipulation Check
In the following, a variety of everyday consumer goods will be presented to you.

Please have a look at each offer and indicate your purchase intention for each product based on your personal impression.

---

Q6 Please indicate how likely you are to buy this product, using the slider on the scale below.

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

End of Block: Chocolate 1
Q7 Please indicate how likely you are to buy this product, using the slider on the scale below.

Extremely unlikely  Extremely likely

End of Block: Chocolate 2
Q8 Please indicate how likely you are to buy this product, using the slider on the scale below.

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>Extremely likely</th>
</tr>
</thead>
</table>

Start of Block: Soap 1 (Sustainable Choice)

End of Block: Soap 1
Q9 Please indicate how likely you are to buy this product, using the slider on the scale below.

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Block: Soap 2
Q10 Please indicate how likely you are to buy this product, using the slider on the scale below.

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image-url" alt="Slider Image" /></td>
<td></td>
</tr>
</tbody>
</table>

End of Block: T-Shirt 1
Q11 Please indicate how likely you are to buy this product, using the slider on the scale below.

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Block: T-Shirt 2
Q12 Please indicate how plentiful you currently feel for each of the following domains, using the scale from 1 (= not at all) to 5 (= extremely).

<table>
<thead>
<tr>
<th>Domain</th>
<th>Not at all (1)</th>
<th>Slightly (2)</th>
<th>Somewhat (3)</th>
<th>Moderately (4)</th>
<th>Extremely (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Friends</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Supportive family</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Success at work</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Energy</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Security</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q13 Below is a collection of statements that may or may not describe you.
Please indicate how much each statement describes you, using the scale from 1 (= not at all) to 5 (= extremely well).
Does not describes me at all (1) | Describes me slightly well (2) | Describes me moderately well (3) | Describes me very well (4) | Describes me extremely well (5)
---|---|---|---|---
I can help others best when people are watching me. | ○ | ○ | ○ | ○ | ○
When other people are around, it is easier for me to help needy others. | ○ | ○ | ○ | ○ | ○
I think that one of the best things about helping others is that it makes me look good. | ○ | ○ | ○ | ○ | ○
I get the most out of helping others when it is done in front of others. | ○ | ○ | ○ | ○ | ○
I believe that donating goods or money works best when it is tax-deductible. | ○ | ○ | ○ | ○ | ○
Helping others when I am in the spotlight is when I work best. | ○ | ○ | ○ | ○ | ○
I believe I should receive more recognition for the time and energy I spend on charity work. | ○ | ○ | ○ | ○ | ○
One of the best things about doing charity work is that it looks good on my resume. | ○ | ○ | ○ | ○ | ○
I feel that if I help someone, they should help me in the future. | ○ | ○ | ○ | ○ | ○

End of Block: Prosocial Tendencies Measure
Start of Block: Control: Demographics

Q14 Gender
   □ Male (1)
   □ Female (2)
   □ Non-binary / third gender (3)
   □ Prefer not to say (4)

Q15 Age
   □ 18-24 (1)
   □ 25-34 (2)
   □ 35-44 (3)
   □ 45-54 (4)
   □ 55 or older (5)
   □ Prefer not to say (6)

Q16 Education
   □ High school graduate (1)
   □ Bachelor degree (2)
   □ Master degree (3)
   □ Doctorate and higher (4)
   □ Prefer not to say (5)
Q17 Monthly income (before taxes)

- ⬜ < 10,000 DKK (< 1.345 €) (1)
- ⬜ 10,000 - 20,000 DKK (1.345 € - 2.690 €) (2)
- ⬜ > 20,000 DKK (2.690 €) (3)
- ⬜ Prefer not to say (4)

Q18 Nationality

End of Block: Control: Demographics

Debrief

Thank you! We highly appreciate you for taking the time to participate in this experiment. Your response has been recorded.

Important, please note:

To conclude, we would like to inform you that in many social psychological studies, deceptive elements are employed and necessary to avoid biasing participants' behavior and to lay optimal grounds for collecting truthful data and testing hypotheses in a valid manner. This has also been the case for the experiment you just participated in.

The actual purpose of this experiment was to explore a potential relationship between (meditative) mindfulness and sustainable consumer decision-making.

If you wish to withdraw your responses in light of this debrief, you can do so within the next 7 days and without giving any reason. Please send us an email to vesi19ab@student.cbs.dk or roro19ae@student.cbs.dk indicating your data withdrawal request and including the random ID number displayed below. This is very important because without this number, we cannot identify and delete your anonymous responses.

Participant ID: $e://Field/Random%20ID$

Lastly, we kindly ask you not to share the actual purpose of this study with your friends, as this would prevent other people from participating in the study. Thank you very much!
Survey Flow

<table>
<thead>
<tr>
<th>Block: Cover Story (2 Questions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Branch: New Branch</strong></td>
</tr>
<tr>
<td><strong>If</strong></td>
</tr>
<tr>
<td><strong>If</strong> Do you have a regular meditation practice (daily or 3-4 times per week)? Yes Is Selected</td>
</tr>
</tbody>
</table>

**EndSurvey: Advanced**

<table>
<thead>
<tr>
<th>Standard: Control: Trait Mindfulness (1 Question)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BlockRandomizer: 1 - Evenly Present Elements</td>
</tr>
<tr>
<td>Standard: Experimental Manipulation 1 (2 Questions)</td>
</tr>
<tr>
<td>Standard: Experimental Manipulation 2 (2 Questions)</td>
</tr>
</tbody>
</table>

| Standard: Manipulation Check (1 Question) |
| Standard: Block 14 (1 Question) |
| BlockRandomizer: 6 - Evenly Present Elements |
| Standard: Chocolate 1 (2 Questions) |
| Standard: Chocolate 2 (2 Questions) |
| Standard: Soap 1 (2 Questions) |
| Standard: Soap 2 (2 Questions) |
| Standard: T-Shirt 1 (2 Questions) |
| Standard: T-Shirt 2 (2 Questions) |

| Standard: Resourcefulness Scale (1 Question) |
| Standard: Prosocial Tendencies Measure (1 Question) |
| Standard: Control: Demographics (5 Questions) |

**EmbeddedData**

Random ID = ${rand://int/10000:99999
Appendix B: Manipulation check for state mindfulness (Hafenbrack et al., 2014).

<table>
<thead>
<tr>
<th>Please indicate to what extent the following statements reflect your experience during the audio recording, using the scale from 1 (= not at all) to 5 (= extremely).</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was focusing on my breathing.</td>
</tr>
<tr>
<td>2. I was focusing on the physical sensation of breathing.</td>
</tr>
<tr>
<td>3. I felt in touch with my body.</td>
</tr>
</tbody>
</table>
Appendix C: Resourcefulness measure (Levontin et al., 2014).

<table>
<thead>
<tr>
<th>Please indicate how plentiful you currently feel for each of the following domains, using the scale from 1 (= not at all) to 5 (= extremely).</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assets</td>
</tr>
<tr>
<td>2. Friends</td>
</tr>
<tr>
<td>3. Supportive family</td>
</tr>
<tr>
<td>4. Success at work</td>
</tr>
<tr>
<td>5. Energy</td>
</tr>
<tr>
<td>6. Security</td>
</tr>
</tbody>
</table>
Appendix D: Adapted prosocial tendencies measure (based on Carlo & Randall, 2002).

Below is a collection of statements that may or may not describe you. Please indicate how much each statement describes you, using the scale from 1 (= not at all) to 5 (= extremely well).

1. I can help others best when people are watching me.
2. When other people are around, it is easier for me to help needy others.
3. I think that one of the best things about helping others is that it makes me look good.
4. I get the most out of helping others when it is done in front of others.
5. I believe that donating goods or money works best when it is tax-deductible.
6. Helping others when I am in the spotlight is when I work best.
7. I believe I should receive more recognition for the time and energy I spend on charity work.
8. One of the best things about doing charity work is that it looks good on my resume.
9. I feel that if I help someone, they should help me in the future.

Note. Item 1, 2, 4, and 6 assess public prosocial behavior, while item 3, 5, 7, 8 and 9 assess altruistic prosocial behavior. The original, randomized order of the items was not changed. Instead, the items of the not used sub-scales were simply removed.
Appendix E: Adapted MAAS for consumer mindfulness (based on Brown & Ryan, 2003).

Below is a collection of statements about your everyday experience as a consumer. Please indicate how frequently or infrequently you currently have each of the experiences, using the scale from 1 (almost never) to 5 (almost always). Please answer to what really reflects your experience rather than what you think your experience should be.

In my role as a consumer...

1. I could be experiencing some emotion and not be conscious of it until some time later.
2. I tend to walk quickly to get where I’m going without paying attention to what I experience along the way.
3. It seems I am “running on automatic” without much awareness of what I’m doing.
4. I rush through activities without being really attentive to them.
5. I find myself listening to someone with one ear, doing something else at the same time.
6. I find myself preoccupied with the future or the past.

Note. The original, randomized order of the scale items was not changed. Instead, the not-used items were simply removed.
Appendix F: Code data analysis (Own depiction).

Note: To read the script correctly, please be aware of the following coding:

Q9 = Trait Mindfulness  
Q14 = Gender  
Q15 = Age  
Q16 = Education  
Q17 = Income  
Q21 = State Mindfulness (Manipulation Check)  
Q320 = Sustainable Consumption  
Q32 = Resourcefulness  
Q35 = Prosocial Tendency

library(readxl)
library(psych)
library(lavaan)

## This is lavaan 0.6-8
## lavaan is FREE software! Please report any bugs.

## Attaching package: 'lavaan'

## The following object is masked from 'package:psych':
## cor2cov

library(lmtest)

## Loading required package: zoo

## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
## as.Date, as.Date.numeric

group_2 = read_excel('C:/Users/RocioR/Downloads/GROUP 2 - CONTROL .xlsx')
group_1 = read_excel('C:/Users/RocioR/Downloads/GROUP 1 - MINDFUL .xlsx')

```r

```

```
```
group_1_filtered = group_1 [group_1$'Q14' == 1 | group_1$'Q14' == 2,]
group_2_filtered = group_2 [group_2$'Q14' == 1 | group_2$'Q14' == 2,]

# Reliability analysis Cronbach’s alpha
dataset = rbind(group_1, group_2)

# Trait mindfulness
group_Q9 = dataset[\c("Q9_1","Q9_2","Q9_3","Q9_4","Q9_5","Q9_6")]
alpha_Q9 = alpha(group_Q9, check.keys=TRUE)
alpha_Q9

## Reliability analysis
## Call: alpha(x = group_Q9, check.keys = TRUE)
##
##   raw_alpha  std.alpha   G6(smc) average_r      S/N   ase  mean   sd median_r
##       0.58      0.57    0.58      0.18  1.30 0.073 3.09 0.55
##
##  lower alpha upper 95% confidence boundaries
##  0.43 0.58 0.72

## Reliability if an item is dropped:
##
##   raw_alpha std.alpha   G6(smc) average_r  S/N alpha se var.r med.r
## Q9_1 0.62      0.63    0.62      0.25 1.68 0.068 0.031 0.232
## Q9_2 0.51      0.50    0.51      0.17 1.02 0.086 0.031 0.070
## Q9_3 0.42      0.41    0.40      0.12 0.71 0.103 0.017 0.081
## Q9_4 0.46      0.43    0.43      0.13 0.77 0.096 0.021 0.084
## Q9_5 0.52      0.50    0.53      0.17 1.01 0.084 0.046 0.067
## Q9_6 0.61      0.59    0.59      0.22 1.43 0.068 0.042 0.214

## Item statistics
##
##   n raw.r std.r r.cor r.drop mean   sd
## Q9_1 76 0.29 0.34 0.072 0.05 2.9 0.79
## Q9_2 76 0.62 0.59 0.469 0.35 3.1 1.05
## Q9_3 76 0.74 0.72 0.722 0.52 3.0 1.08
## Q9_4 76 0.69 0.69 0.668 0.50 2.6 0.88
## Q9_5 76 0.59 0.59 0.437 0.34 2.9 0.99
## Q9_6 76 0.44 0.43 0.193 0.15 3.5 1.01

## Non missing response frequency for each item
##
##     1  2  3  4  5 miss
## Q9_1 0.04 0.26 0.49 0.21 0.00 0
## Q9_2 0.05 0.25 0.29 0.33 0.08 0
## Q9_3 0.11 0.21 0.37 0.25 0.07 0
## Q9_4 0.11 0.34 0.39 0.16 0.00 0
## Q9_5 0.11 0.21 0.38 0.29 0.01 0
## Q9_6 0.03 0.13 0.29 0.38 0.17 0

#sustainable consumption: sustainable choices
group_Qsus = dataset[c("Q19_1","Q26_1","Q30_1")]
alpha_Qsus = alpha(group_Qsus,check_keys=TRUE)
alpha_Qsus

## Reliability analysis
## Call: alpha(x = group_Qsus, check.keys = TRUE)
##
## raw_alpha std.alpha G6(smc) average_r S/N ase mean sd median_r
## 0.47 0.47 0.38 0.23 0.9 0.1 2.5 1.1 0.24
##
## lower alpha upper 95% confidence boundaries
## 0.27 0.47 0.68
##
## Reliability if an item is dropped:
## raw_alpha std.alpha G6(smc) average_r S/N ase mean sd median_r
## Q19_1 0.39 0.39 0.24 0.24 0.64 0.14 NA 0.24
## Q26_1 0.34 0.34 0.21 0.21 0.52 0.15 NA 0.21
## Q30_1 0.39 0.39 0.24 0.24 0.65 0.14 NA 0.24
##
## Item statistics
## n raw.r std.r r.cor r.drop mean sd
## Q19_1 76 0.72 0.69 0.42 0.29 2.4 1.6
## Q26_1 76 0.71 0.71 0.45 0.31 2.7 1.5
## Q30_1 76 0.66 0.69 0.41 0.28 2.5 1.4
##
## Non missing response frequency for each item
## 0 1 2 3 4 5 miss
## Q19_1 0.13 0.25 0.11 0.20 0.2 0.12 0
## Q26_1 0.08 0.20 0.14 0.25 0.2 0.13 0
## Q30_1 0.14 0.09 0.14 0.39 0.2 0.03 0

#State mindfulness

group_Q21 = dataset[c("Q21_1","Q21_2","Q21_3")]
alpha_Q21 = alpha(group_Q21,check_keys=TRUE)
alpha_Q21

## Reliability analysis
## Call: alpha(x = group_Q21, check.keys = TRUE)
<table>
<thead>
<tr>
<th>raw_alpha</th>
<th>std.alpha</th>
<th>G6(smc)</th>
<th>average_r</th>
<th>S/N</th>
<th>ase</th>
<th>mean</th>
<th>sd</th>
<th>median_r</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>0.81</td>
<td>0.76</td>
<td>0.58</td>
<td>4.1</td>
<td>0.041</td>
<td>3</td>
<td>0.96</td>
<td>0.56</td>
</tr>
</tbody>
</table>

| lower alpha upper 95% confidence boundaries |
| 0.72 0.8 0.88 |

Reliability if an item is dropped:

<table>
<thead>
<tr>
<th>raw_alpha</th>
<th>std.alpha</th>
<th>G6(smc)</th>
<th>average_r</th>
<th>S/N</th>
<th>alpha</th>
<th>se</th>
<th>var.r</th>
<th>med.r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q21_1</td>
<td>0.72</td>
<td>0.72</td>
<td>0.56</td>
<td>2.5</td>
<td>0.065</td>
<td>NA</td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>Q21_2</td>
<td>0.62</td>
<td>0.62</td>
<td>0.45</td>
<td>1.6</td>
<td>0.088</td>
<td>NA</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>Q21_3</td>
<td>0.84</td>
<td>0.84</td>
<td>0.73</td>
<td>5.4</td>
<td>0.036</td>
<td>NA</td>
<td>0.73</td>
<td></td>
</tr>
</tbody>
</table>

Item statistics

<table>
<thead>
<tr>
<th>n</th>
<th>raw.r</th>
<th>std.r</th>
<th>r.cor</th>
<th>r.drop</th>
<th>mean</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q21_1</td>
<td>76</td>
<td>0.85</td>
<td>0.86</td>
<td>0.77</td>
<td>0.66</td>
<td>3.1</td>
</tr>
<tr>
<td>Q21_2</td>
<td>76</td>
<td>0.89</td>
<td>0.90</td>
<td>0.85</td>
<td>0.76</td>
<td>3.1</td>
</tr>
<tr>
<td>Q21_3</td>
<td>76</td>
<td>0.80</td>
<td>0.79</td>
<td>0.60</td>
<td>0.54</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Non missing response frequency for each item

| Q21_1 | 1 | 0.11 | 0.20 | 0.25 | 0.37 | 0.08 |
| Q21_2 | 0.05 | 0.28 | 0.29 | 0.29 | 0.09 |
| Q21_3 | 0.14 | 0.22 | 0.28 | 0.29 | 0.07 |

Resourcefulness

group_Q32 = dataset[c("Q32_1","Q32_2","Q32_3","Q32_4","Q32_5","Q32_6")]
alpha_Q32 = alpha(group_Q32, check.keys=TRUE)
alpha_Q32

Reliability analysis

Call: alpha(x = group_Q32, check.keys = TRUE)

<table>
<thead>
<tr>
<th>raw_alpha</th>
<th>std.alpha</th>
<th>G6(smc)</th>
<th>average_r</th>
<th>S/N</th>
<th>ase</th>
<th>mean</th>
<th>sd</th>
<th>median_r</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.7</td>
<td>0.71</td>
<td>0.7</td>
<td>0.29</td>
<td>2.4</td>
<td>0.054</td>
<td>3.8</td>
<td>0.57</td>
<td>0.29</td>
</tr>
</tbody>
</table>

lower alpha upper 95% confidence boundaries

| 0.59 0.7 0.8 |

Reliability if an item is dropped:

<table>
<thead>
<tr>
<th>raw_alpha</th>
<th>std.alpha</th>
<th>G6(smc)</th>
<th>average_r</th>
<th>S/N</th>
<th>alpha</th>
<th>se</th>
<th>var.r</th>
<th>med.r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q32_1</td>
<td>0.70</td>
<td>0.71</td>
<td>0.68</td>
<td>2.5</td>
<td>0.055</td>
<td>0.121</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Q32_2</td>
<td>0.63</td>
<td>0.63</td>
<td>0.59</td>
<td>1.7</td>
<td>0.068</td>
<td>0.064</td>
<td>0.27</td>
<td></td>
</tr>
<tr>
<td>Q32_3</td>
<td>0.63</td>
<td>0.64</td>
<td>0.61</td>
<td>1.8</td>
<td>0.067</td>
<td>0.0106</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>Q32_4</td>
<td>0.68</td>
<td>0.68</td>
<td>0.66</td>
<td>2.1</td>
<td>0.059</td>
<td>0.0178</td>
<td>0.30</td>
<td></td>
</tr>
</tbody>
</table>
## Item statistics

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>raw.r</th>
<th>std.r</th>
<th>r.cor</th>
<th>r.drop</th>
<th>mean</th>
<th>sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q32_1</td>
<td>76</td>
<td>0.54</td>
<td>0.53</td>
<td>0.36</td>
<td>0.31</td>
<td>3.4</td>
<td>0.91</td>
</tr>
<tr>
<td>Q32_2</td>
<td>76</td>
<td>0.71</td>
<td>0.73</td>
<td>0.68</td>
<td>0.55</td>
<td>4.3</td>
<td>0.81</td>
</tr>
<tr>
<td>Q32_3</td>
<td>76</td>
<td>0.69</td>
<td>0.71</td>
<td>0.65</td>
<td>0.52</td>
<td>4.4</td>
<td>0.84</td>
</tr>
<tr>
<td>Q32_4</td>
<td>76</td>
<td>0.65</td>
<td>0.61</td>
<td>0.48</td>
<td>0.40</td>
<td>3.5</td>
<td>1.08</td>
</tr>
<tr>
<td>Q32_5</td>
<td>76</td>
<td>0.64</td>
<td>0.65</td>
<td>0.55</td>
<td>0.45</td>
<td>3.4</td>
<td>0.87</td>
</tr>
<tr>
<td>Q32_6</td>
<td>76</td>
<td>0.60</td>
<td>0.61</td>
<td>0.47</td>
<td>0.39</td>
<td>3.7</td>
<td>0.88</td>
</tr>
</tbody>
</table>

## Non missing response frequency for each item

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>miss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q32_1</td>
<td>0.03</td>
<td>0.11</td>
<td>0.41</td>
<td>0.36</td>
<td>0.11</td>
<td>0.00</td>
</tr>
<tr>
<td>Q32_2</td>
<td>0.01</td>
<td>0.03</td>
<td>0.07</td>
<td>0.47</td>
<td>0.42</td>
<td>0.00</td>
</tr>
<tr>
<td>Q32_3</td>
<td>0.01</td>
<td>0.01</td>
<td>0.11</td>
<td>0.28</td>
<td>0.59</td>
<td>0.00</td>
</tr>
<tr>
<td>Q32_4</td>
<td>0.07</td>
<td>0.12</td>
<td>0.24</td>
<td>0.45</td>
<td>0.13</td>
<td>0.00</td>
</tr>
<tr>
<td>Q32_5</td>
<td>0.01</td>
<td>0.14</td>
<td>0.39</td>
<td>0.37</td>
<td>0.08</td>
<td>0.00</td>
</tr>
<tr>
<td>Q32_6</td>
<td>0.03</td>
<td>0.03</td>
<td>0.32</td>
<td>0.45</td>
<td>0.18</td>
<td>0.00</td>
</tr>
</tbody>
</table>

# Prosocial Tendency

group_Q35 = dataset[c("Q35_1","Q35_2","Q35_3","Q35_4","Q35_5","Q35_6","Q35_7","Q35_8","Q35_9")]
alpha_Q35 = alpha(group_Q35, check.keys=TRUE)
alpha_Q35

## Reliability analysis

## Call: alpha(x = group_Q35, check.keys = TRUE)

<table>
<thead>
<tr>
<th>raw.alpha</th>
<th>std.alpha</th>
<th>G6(smc)</th>
<th>average.r</th>
<th>S/N</th>
<th>ase</th>
<th>mean</th>
<th>sd</th>
<th>median.r</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.83</td>
<td>0.84</td>
<td>0.87</td>
<td>0.37</td>
<td>5.3</td>
<td>0.03</td>
<td>1.6</td>
<td>0.51</td>
<td>0.38</td>
</tr>
</tbody>
</table>

## lower alpha upper 95% confidence boundaries

| 0.77 | 0.83 | 0.88 |

## Reliability if an item is dropped:

<table>
<thead>
<tr>
<th>raw.alpha</th>
<th>std.alpha</th>
<th>G6(smc)</th>
<th>average.r</th>
<th>S/N</th>
<th>alpha</th>
<th>se</th>
<th>var.r</th>
<th>med.r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q35_1</td>
<td>0.80</td>
<td>0.82</td>
<td>0.83</td>
<td>0.36</td>
<td>4.5</td>
<td>0.035</td>
<td>0.023</td>
<td>0.39</td>
</tr>
<tr>
<td>Q35_2</td>
<td>0.80</td>
<td>0.82</td>
<td>0.82</td>
<td>0.36</td>
<td>4.5</td>
<td>0.036</td>
<td>0.023</td>
<td>0.38</td>
</tr>
<tr>
<td>Q35_3</td>
<td>0.80</td>
<td>0.82</td>
<td>0.84</td>
<td>0.36</td>
<td>4.5</td>
<td>0.035</td>
<td>0.030</td>
<td>0.35</td>
</tr>
<tr>
<td>Q35_4</td>
<td>0.80</td>
<td>0.81</td>
<td>0.84</td>
<td>0.35</td>
<td>4.3</td>
<td>0.035</td>
<td>0.029</td>
<td>0.33</td>
</tr>
<tr>
<td>Q35_5</td>
<td>0.84</td>
<td>0.85</td>
<td>0.87</td>
<td>0.41</td>
<td>5.6</td>
<td>0.027</td>
<td>0.021</td>
<td>0.43</td>
</tr>
<tr>
<td>Q35_6</td>
<td>0.80</td>
<td>0.81</td>
<td>0.84</td>
<td>0.35</td>
<td>4.3</td>
<td>0.035</td>
<td>0.025</td>
<td>0.36</td>
</tr>
<tr>
<td>Q35_7</td>
<td>0.81</td>
<td>0.83</td>
<td>0.85</td>
<td>0.37</td>
<td>4.8</td>
<td>0.033</td>
<td>0.027</td>
<td>0.38</td>
</tr>
</tbody>
</table>
## Q35_8      0.79      0.81    0.83      0.34 4.2    0.036 0.025  0.36
## Q35_9      0.83      0.85    0.87      0.41 5.6    0.029 0.023  0.43
##
## Item statistics
##        n raw.r std.r r.cor r.drop mean   sd
## Q35_1 76  0.72  0.69  0.69   0.60  1.7 0.90
## Q35_2 76  0.74  0.71  0.71   0.63  1.9 0.93
## Q35_3 76  0.70  0.71  0.66   0.61  1.5 0.70
## Q35_4 76  0.73  0.76  0.73   0.67  1.3 0.54
## Q35_5 76  0.48  0.46  0.35   0.30  1.7 0.96
## Q35_6 76  0.73  0.75  0.73   0.65  1.5 0.70
## Q35_7 76  0.62  0.64  0.58   0.51  1.4 0.77
## Q35_8 76  0.76  0.77  0.75   0.68  1.5 0.72
## Q35_9 76  0.46  0.46  0.34   0.30  1.6 0.78
##
## Non missing response frequency for each item
##          1    2    3    4    5 miss
## Q35_1 0.57 0.22 0.17 0.04 0.00    0
## Q35_2 0.43 0.33 0.17 0.07 0.00    0
## Q35_3 0.62 0.29 0.08 0.01 0.00    0
## Q35_4 0.75 0.21 0.04 0.00 0.00    0
## Q35_5 0.54 0.25 0.16 0.04 0.01    0
## Q35_6 0.64 0.26 0.08 0.01 0.00    0
## Q35_7 0.75 0.16 0.05 0.04 0.00    0
## Q35_8 0.59 0.33 0.05 0.03 0.00    0
## Q35_9 0.57 0.28 0.14 0.01 0.00    0

#Inferential Statistics

#Gender
prop.test(c(14,12),c(33,40))

## 2-sample test for equality of proportions with continuity correction
## data:  c(14, 12) out of c(33, 40)
## X-squared = 0.7357, df = 1, p-value = 0.391
## alternative hypothesis: two.sided
## 95 percent confidence interval:
## -0.1238666 0.3723515
## sample estimates:
## prop 1 prop 2
## 0.4242424 0.3000000
## Education

```r
mann_whitney_education = wilcox.test(group_1_education$Q16, group_2_education$Q16, exact = FALSE)
```

```
##  Wilcoxon rank sum test with continuity correction
##
data:  group_1_education$Q16 and group_2_education$Q16
## W = 735.5, p-value = 0.6488
## alternative hypothesis: true location shift is not equal to 0
```

## Income

```r
m_w_income = wilcox.test(group_1_income$Q17, group_2_income$Q17, exact = FALSE)
```

```
##  Wilcoxon rank sum test with continuity correction
##
data:  group_1_income$Q17 and group_2_income$Q17
## W = 612.5, p-value = 0.7136
## alternative hypothesis: true location shift is not equal to 0
```

## Age

```r
m_w_age = wilcox.test(group_1$Q15, group_2$Q15, exact = FALSE)
```

```
##  Wilcoxon rank sum test with continuity correction
##
data:  group_1$Q15 and group_2$Q15
```
## W = 574, p-value = 0.08666
## alternative hypothesis: true location shift is not equal to 0

Trait Mindfulness: Is G1 more mindful than group 2?
x1 = group_1$Q9
x2 = group_2$Q9

\texttt{var.test(x1,x2)}

## F test to compare two variances
##
data:  x1 and x2
## F = 0.93634, num df = 33, denom df = 41, p-value = 0.853
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
## 0.4904211 1.8304716
## sample estimates:
## ratio of variances
## 0.9363355

\texttt{sd(x1)}

## [1] 0.5345324

\texttt{sd(x2)}

## [1] 0.5524059

\texttt{test_q9 = t.test(group_1$Q9,group_2$Q9,var.equal = T,alternative = "two.sided ")}

\texttt{test_q9}

## Two Sample t-test
##
data:  group_1$Q9 and group_2$Q9
## t = -1.6241, df = 74, p-value = 0.1086
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## -0.45431133 0.04628145
## sample estimates:
## mean of x mean of y
## 2.887255 3.091270
# Manipulation check/state mindfulness: Has G1 been more focused than G2?
x1 = group_1$Q21
x2 = group_2$Q21

```
var.test(x1,x2)
```

```R
## F test to compare two variances
##
## data:  x1 and x2
## F = 0.66615, num df = 33, denom df = 41, p-value = 0.232
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
##  0.3489089 1.3022844
## sample estimates:
## ratio of variances
##          0.6661535
```

```
sd(x1)
```

```R
## [1] 0.8018102
```

```
sd(x2)
```

```R
## [1] 0.9823911
```

```
test_q21 = t.test(group_1$Q21,group_2$Q21,var.equal = T,alternative = "two.sided")
test_q21
```

```R
## Two Sample t-test
##
## data:  group_1$Q21 and group_2$Q21
## t = 3.0523, df = 74, p-value = 0.003153
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## 0.2215774 1.0547998
## sample estimates:
## mean of x mean of y
## 3.392157 2.753968
```

# Sustainable behavior: Is G1 taking more sustainable decisions than G2?
x1 = group_1$Q320
x2 = group_2$Q320

```
var.test(x1,x2)
```

```R
## F test to compare two variances
```
## data:  x1 and x2
## F = 0.94951, num df = 33, denom df = 41, p-value = 0.8859
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
## 0.4973191 1.8562179
## sample estimates:
## ratio of variances
## 0.9495054

sd(x1)
## [1] 1.025135

sd(x2)
## [1] 1.05204

test_q320 = t.test(group_1$Q320, group_2$Q320, var.equal = T, alternative = "two.sided")
test_q320

## Two Sample t-test
## data:  group_1$Q320 and group_2$Q320
## t = -1.8814, df = 74, p-value = 0.06385
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## -0.9295675  0.0266730
## sample estimates:
## mean of x mean of y
## 0.2549020 0.7063492

#Resourcefulness: Does mindfulness increase resourcefulness?
x1 = group_1$Q32
x2 = group_2$Q32

var.test(x1, x2)

## F test to compare two variances
## data:  x1 and x2
## F = 0.63829, num df = 33, denom df = 41, p-value = 0.1868
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
## 0.334316 1.247817
## sample estimates:
## ratio of variances

sd(x1)

## [1] 0.4931949

sd(x2)

## [1] 0.6173179

test_q32 = \texttt{t.test(group\_1$Q32, group\_2$Q32, var.equal = T, alternative = "two.sided")}

test_q32

## Two Sample t-test

## data: group\_1$Q32 and group\_2$Q32
## t = -1.5589, df = 74, p-value = 0.1233
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## -0.46318825  0.05655893
## sample estimates:
## mean of x mean of y
##  3.661765  3.865079

#Prosocial bhv: Does mindfulness increase prosocial behavior?

x1 = group\_1$Q35

x2 = group\_2$Q35

\texttt{var.test(x1, x2)}

## F test to compare two variances

## data: x1 and x2
## F = 0.89, num df = 33, denom df = 41, p-value = 0.736
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
## 0.4661528 1.7398914
## sample estimates:
## ratio of variances
## 0.8900013

sd(x1)

## [1] 0.4948737

sd(x2)
```r
test_q35 = t.test(group_1$Q35, group_2$Q35, var.equal = T, alternative = "two.sided")
test_q35
```

```
##
##  Two Sample t-test
##
## data:  group_1$Q35 and group_2$Q35
## t = 0.40615, df = 74, p-value = 0.6858
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##    -0.1872103  0.2830709
## sample estimates:
##  mean of x  mean of y
##   1.584967   1.537037
```

# Correlation tests
dataset = rbind(group_1, group_2)

# Correlation btw prosocial bhv sustainable consumption
plot(dataset$Q320, dataset$Q35, xlim = c(0,5), ylim = c(0,5))
```
cor(dataset$Q320,dataset$Q35)
## [1] 0.08075401

cor.test(dataset$Q320,dataset$Q35)

##
##  Pearson's product
##  moment correlation
##
## data:  dataset$Q320 and dataset$Q35
## t = 0.69695, df = 74, p-value = 0.488
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.1473849  0.3007343
## sample estimates:
##        cor
## 0.08075401

#Correlation btw resourcefulness and prosocial bhv
plot(dataset$Q32,dataset$Q35,xlim = c(0,5),ylim=c(0,5))
## Pearson's product-moment correlation

```
data: dataset$Q32 and dataset$Q35
t = -1.0637, df = 74, p-value = 0.2909
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
-0.3388029 0.1056575
sample estimates:
cor
-0.1227214
```

#Correlation btw resourcefulness and sustainable consumption

```r
cor(dataset$Q32, dataset$Q320)
## [1] -0.04313159
cor.test(dataset$Q32, dataset$Q320)
```

```r
## Pearson's product-moment correlation
## data: dataset$Q32 and dataset$Q320
t = -0.37138, df = 74, p-value = 0.7114
```
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.2660005  0.1841143
## sample estimates:
##        cor
## -0.04313159

#Correlation btw trait mindfulness and resourcefulness
plot(dataset$Q9,dataset$Q32,xlim = c(0,5),ylim=c(0,5))

cor(dataset$Q9,dataset$Q32)
## [1] -0.1473799
cor.test(dataset$Q9,dataset$Q32)
##
## Pearson's product-moment correlation
##
## data:  dataset$Q9 and dataset$Q32
## t = -1.2818, df = 74, p-value = 0.2039
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.3608454  0.0807591
## sample estimates:
# Correlation btw trait mindfulness and prosocial bhv

```r
plot(dataset$Q9, dataset$Q35, xlim = c(0, 5), ylim = c(0, 5))
```

```r
cor(dataset$Q9, dataset$Q35)
## [1] 0.1931294
cor.test(dataset$Q9, dataset$Q35)
```

```
## Pearson's product-moment correlation
## data: dataset$Q9 and dataset$Q35
## t = 1.6932, df = 74, p-value = 0.09462
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.03379774 0.40111939
## sample estimates:
## cor
## 0.1931294
```
# Correlation btw trait mindfulness and sustainable consumption

```r
plot(dataset$Q9,dataset$Q320,xlim = c(0,5),ylim=c(0,5),pch=16)
```

```r
cor(dataset$Q9,dataset$Q320)
## [1] -0.1056165
cor.test(dataset$Q9,dataset$Q320)
```

### Pearson's product-moment correlation

**data:** dataset$Q9 and dataset$Q320  
**t =** -0.91366, df = 74, p-value = 0.3639  
**alternative hypothesis:** true correlation is not equal to 0  
**95 percent confidence interval:**  
-0.3233720  0.1227622  
**sample estimates:**  
**cor**  
-0.1056165

# Correlation btw state mindfulness and sustainable consumption

```r
plot(dataset$Q21,dataset$Q320,xlim = c(0,5),ylim=c(0,5),pch=16)
```
cor(dataset$Q21, dataset$Q320)

## [1] 0.01229105

cor.test(dataset$Q21, dataset$Q320)

## Pearson's product-moment correlation

## data:  dataset$Q21 and dataset$Q320
## t = 0.10574, df = 74, p-value = 0.9161
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.2137568  0.2370896
## sample estimates:
##        cor
## 0.01229105
# Correlation btw state mindfulness and trait mindfulness

```r
plot(dataset$Q21, dataset$Q9, xlim = c(0,5), ylim = c(0,5), pch = 16)

cor(dataset$Q21, dataset$Q9)
## [1] -0.316985

cor.test(dataset$Q21, dataset$Q9)
##
## Pearson's product-moment correlation
##
## data:  dataset$Q21 and dataset$Q9
## t = -2.8751, df = 74, p-value = 0.005272
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.50626014  -0.09857415
## sample estimates:
##   cor
## -0.316985
```
# Correlation btw state mindfulness and Resourcefulness

```r
plot(dataset$Q21, dataset$Q32, xlim = c(0, 5), ylim = c(0, 5), pch = 16)
```

```r
cor(dataset$Q21, dataset$Q32)
```

```r
## [1] 0.1619587
```

```r
cor.test(dataset$Q21, dataset$Q32)
```

```r
##
##  Pearson's product-moment correlation
##
## data:  dataset$Q21 and dataset$Q32
## t = 1.4119, df = 74, p-value = 0.1622
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.06590325 0.37376637
## sample estimates:
## cor
## 0.1619587
```

# Correlation btw state mindfulness and Prosocial Behavior

```r
plot(dataset$Q21, dataset$Q35, xlim = c(0, 5), ylim = c(0, 5), pch = 16)
```
cor(dataset$Q21, dataset$Q35)
## [1] 0.07089898

cor.test(dataset$Q21, dataset$Q35)
##
##  Pearson's product-moment correlation
##
## data:  dataset$Q21 and dataset$Q35
## t = 0.61143, df = 74, p-value = 0.5428
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##    -0.1570672  0.2916920
## sample estimates:
## cor
## 0.07089898
# Correlation btw age and trait mindfulness

```r
plot(dataset$Q15, dataset$Q9, xlim = c(0, 5), ylim = c(0, 5), pch = 16)
```

```
cor(dataset$Q9, dataset$Q15)
## [1] 0.06997953

cor.test(dataset$Q9, dataset$Q15)
##
##  Pearson's product-moment correlation
##  data:  dataset$Q9 and dataset$Q15
##  t = 0.60347, df = 74, p-value = 0.548
##  alternative hypothesis: true correlation is not equal to 0
##  95 percent confidence interval:
##  -0.1579683  0.2908463
##  sample estimates:
##  cor
##  0.06997953
```
# Correlation btw age and state mindfulness

```r
plot(dataset$Q15, dataset$Q21, xlim = c(0, 5), ylim = c(0, 5), pch = 16)

cor(dataset$Q21, dataset$Q15)
## [1] -0.001591689

cor.test(dataset$Q21, dataset$Q15)
##
## Pearson's product-moment correlation
##
## data: dataset$Q21 and dataset$Q15
## t = -0.013692, df = 74, p-value = 0.9891
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##   -0.2269658  0.2239442
## sample estimates:
##   cor
## -0.001591689
```
# Correlation btw age and sust consumption

```r
plot(dataset$Q15, dataset$Q320, xlim = c(0, 5), ylim = c(0, 5), pch = 16)
```

```r
cor(dataset$Q15, dataset$Q320)
## [1] 0.0666115

cor.test(dataset$Q15, dataset$Q320)
##
## Pearson's product-moment correlation
##
## data:  dataset$Q15 and dataset$Q320
## t = 0.57429, df = 74, p-value = 0.5675
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##    -0.1612659  0.2877457
## sample estimates:
##     cor
## 0.0666115
```
# Correlation btw age and prosoc bhv

```r
plot(dataset$Q15, dataset$Q35, xlim = c(0, 5), ylim = c(0, 5), pch = 16)
```

```r
cor(dataset$Q15, dataset$Q35)
## [1] -0.008634923
cor.test(dataset$Q15, dataset$Q35)

## Pearson's product-moment correlation
##
data: dataset$Q15 and dataset$Q35
## t = -0.074283, df = 74, p-value = 0.941
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.2336356 0.2172435
## sample estimates:
##         cor
## -0.008634923
```
# Correlation btw age and resourcefulness

```r
plot(dataset$Q15, dataset$Q32, xlim = c(0, 5), ylim = c(0, 5), pch = 16)

cor(dataset$Q15, dataset$Q32)
## [1] 0.09398562
cor.test(dataset$Q15, dataset$Q32)
##
## Pearson's product-moment correlation
##
## data:  dataset$Q15 and dataset$Q32
## t = 0.81209, df = 74, p-value = 0.4193
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
## -0.1343160 0.3128128
## sample estimates:
## cor
## 0.09398562
```
# Logistic Linear Regression

Regression_age2 = glm(Q320~Q15+Q16+Q17, data=dataset)
summary(Regression_age2)

##
## Call:
glm(formula = Q320 ~ Q15 + Q16 + Q17, data = dataset)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.6338   -0.6013  -0.1338   0.5778   3.0492
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 0.9208     0.6068   1.517    0.134
## Q15         0.1653     0.1823   0.907    0.368
## Q16        -0.1302     0.1585  -0.821    0.414
## Q17        -0.1868     0.1436  -1.300    0.198
##
## (Dispersion parameter for gaussian family taken to be 1.126578)
##
## Null deviance: 83.887  on 75  degrees of freedom
## Residual deviance: 81.114  on 72  degrees of freedom
## AIC: 230.63
##
## Number of Fisher Scoring iterations: 2

# Serial mediation

df=dataset

model=
"#Regressions
Q32~a*Q21
Q35~b*Q32+e*Q21
Q320~c*Q35+f*Q32+d*Q21

#Defined Parameters:
ie   := a*b*c
d   := d
lm1 := a*f
lm2 := e*c"

Regression_4 = sem(model,df)

summary(Regression_4)
## lavaan 0.6-8 ended normally after 22 iterations
##
## Estimator: ML
## Optimization method: NLMINB
## Number of model parameters: 9
##
## Number of observations: 76
##
## Model Test User Model:
##
## Test statistic: 0.000
## Degrees of freedom: 0
##
## Parameter Estimates:
##
## Standard errors: Standard
## Information: Expected
## Information saturated (h1) model: Structured
##
## Regressions:
##
## |   | Estimate | Std.Err | z-value | P(>|z|) |
## |---|----------|---------|---------|---------|
## Q32 ~
## Q21    (a)  0.097  0.068   1.431   0.152
## Q35 ~
## Q32    (b) -0.123  0.102  -1.200   0.230
## Q21    (e)  0.050  0.061   0.812   0.417
## Q320 ~
## Q35    (c)  0.157  0.240   0.652   0.514
## Q32    (f) -0.067  0.217  -0.308   0.758
## Q21    (d)  0.014  0.129   0.110   0.913
##
## Variances:
##
## |   | Estimate | Std.Err | z-value | P(>|z|) |
## |---|----------|---------|---------|---------|
## .Q32   0.313  0.051  6.164   0.000
## .Q35   0.249  0.040  6.164   0.000
## .Q320  1.095  0.178  6.164   0.000
##
## Defined Parameters:
##
## |   | Estimate | Std.Err | z-value | P(>|z|) |
## |---|----------|---------|---------|---------|
## ie     -0.002  0.004  -0.532   0.595
## de     0.014  0.129  0.110   0.913
## lm1    -0.006  0.021  -0.301   0.764
## lm2     0.008  0.015  0.508   0.611

summary(Regression_4)$r.squared

## lavaan 0.6-8 ended normally after 22 iterations
##
## Estimator

ML

## Optimization method

NLMINB

## Number of model parameters

9

## Number of observations

76

## Model Test User Model:

## Test statistic

0.000

## Degrees of freedom

0

## Parameter Estimates:

## Standard errors

Standard

## Information

Expected

## Information saturated (h1) model

Structured

## Regressions:

|        | Estimate | Std.Err | z-value | P(>|z|) |
|--------|----------|---------|---------|---------|
| Q32    |          |         |         |         |
| Q21    | 0.097    | 0.068   | 1.431   | 0.152   |
| Q35    | -0.123   | 0.102   | -1.200  | 0.230   |
| Q21    | 0.050    | 0.061   | 0.812   | 0.417   |
| Q320   | 0.157    | 0.240   | 0.652   | 0.514   |
| Q32    | -0.067   | 0.217   | -0.308  | 0.758   |
| Q21    | 0.014    | 0.129   | 0.110   | 0.913   |

## Variances:

|        | Estimate | Std.Err | z-value | P(>|z|) |
|--------|----------|---------|---------|---------|
| .Q32   | 0.313    | 0.051   | 6.164   | 0.000   |
| .Q35   | 0.249    | 0.040   | 6.164   | 0.000   |
| .Q320  | 1.095    | 0.178   | 6.164   | 0.000   |

## Defined Parameters:

|        | Estimate | Std.Err | z-value | P(>|z|) |
|--------|----------|---------|---------|---------|
| ie     | -0.002   | 0.004   | -0.532  | 0.595   |
| de     | 0.014    | 0.129   | 0.110   | 0.913   |
| lm1    | -0.006   | 0.021   | -0.301  | 0.764   |
| lm2    | 0.008    | 0.015   | 0.508   | 0.611   |

summary(Regression_4, rsquare=T, standardized=T)

lavaan 0.6-8 ended normally after 22 iterations

Estimator ML
## Optimization method
NLMINB

## Number of model parameters
9

## Number of observations
76

## Model Test User Model:

## Test statistic
0.000

## Degrees of freedom
0

## Parameter Estimates:

## Standard errors
Standard

## Information
Expected

## Information saturated (h1) model
Structured

## Regressions:

|        | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|--------|----------|---------|---------|---------|--------|---------|
| Q32 ~  |          |         |         |         |        |         |
| Q21    | (a) 0.097| 0.068   | 1.431   | 0.152   | 0.097  | 0.162   |
| Q35 ~  |          |         |         |         |        |         |
| Q32    | (b) -0.123| 0.102  | -1.200  | 0.230   | -0.123| -0.138  |
| Q21    | (e) 0.050| 0.061   | 0.812   | 0.417   | 0.050  | 0.093   |
| Q320   |          |         |         |         |        |         |
| Q35    | (c) 0.157| 0.240   | 0.652   | 0.514   | 0.157  | 0.075   |
| Q32    | (f) -0.067| 0.217  | -0.308  | 0.758   | -0.067| -0.036  |
| Q21    | (d) 0.014| 0.129   | 0.110   | 0.913   | 0.014  | 0.013   |

## Variances:

|        | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|--------|----------|---------|---------|---------|--------|---------|
| Q32    | 0.313    | 0.051   | 6.164   | 0.000   | 0.313  | 0.974   |
| Q35    | 0.249    | 0.040   | 6.164   | 0.000   | 0.249  | 0.976   |
| Q320   | 1.095    | 0.178   | 6.164   | 0.000   | 1.095  | 0.992   |

## R-Square:

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q32</td>
<td>0.026</td>
</tr>
<tr>
<td>Q35</td>
<td>0.024</td>
</tr>
<tr>
<td>Q320</td>
<td>0.008</td>
</tr>
</tbody>
</table>

## Defined Parameters:

|        | Estimate | Std.Err | z-value | P(>|z|) | Std.lv | Std.all |
|--------|----------|---------|---------|---------|--------|---------|
| iε     | -0.002   | 0.004   | -0.532  | 0.595   | -0.002| -0.002  |
| dε     | 0.014    | 0.129   | 0.110   | 0.913   | 0.014 | 0.013   |
| lε1    | -0.006   | 0.021   | -0.301  | 0.764   | -0.006| -0.006  |
| lε2    | 0.008    | 0.015   | 0.508   | 0.611   | 0.008 | 0.007   |