



UNIVERSIDADE CATÓLICA PORTUGUESA

EXPLORING THE IMPACT OF MINDFULNESS ON CIRCULAR
ECONOMY BEHAVIOUR:
An Experimental Study

Dissertation presented to Universidade Católica Portuguesa
to obtain a Master's Degree in Psychology in Business and
Economics

By

Julia Evseev

Faculty of Human Sciences

October 2023



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Abstract

The concept of circular economy has emerged to address the key environmental issues of our time by altering our understanding of how we produce and consume finite resources. Given the importance of consumers within a functioning economy, a shift from a linear to a circular economy also requires a change in consumer consumption practices. Hence, in the pursuit of fostering more circular consumer behaviours, researchers and policymakers have been exploring various strategies. This dissertation proposes mindfulness as a possible solution. Using a sample of 96 participants, this study explores the relationship between dispositional mindfulness, circular economy behaviour, and willingness to pay (WTP) for circular products, as well as the impact of a brief mindfulness intervention on circular economy behaviour and WTP. Additionally, it examines whether perceived consumer effectiveness (PCE) and future time perspective (TP) mediate the relationship between mindfulness and circular economy behaviour or WTP. The findings reveal that dispositional mindfulness positively predicts circular economy behaviour, aligning with previous research on the correlation between mindfulness and sustainable consumption. The study also demonstrates that a brief mindfulness intervention can enhance circular economy behaviour, as the mindful-intervention group reported greater levels of circular economy behavioural intentions compared to a randomized control group. However, the study did not find a significant relationship between dispositional mindfulness and WTP for circular products, suggesting that mindful individuals may not necessarily be more willing to pay for circular products. The absence of direct mediation between dispositional mindfulness and circular economy behaviour or WTP highlights the need for further investigation into alternative mediating factors. The study contributes to the emerging field of mindfulness in sustainability and circular economy contexts and offers insights for policymakers, businesses, and researchers seeking to promote circular economy behaviours.

Keywords: Mindfulness, Circular Economy, Willingness to Pay, Consumption, Perceived Consumer Effectiveness, Time Perspective

Resumo

O conceito de economia circular surgiu para abordar as principais questões ambientais do nosso tempo, alterando a nossa compreensão da forma como produzimos e consumimos recursos finitos. Dada a importância dos consumidores numa economia funcional, a passagem de uma economia linear para uma economia circular exige também uma mudança nas práticas de consumo dos consumidores. Assim, na procura de fomentar comportamentos de consumo mais circulares, investigadores e decisores políticos têm vindo a explorar várias estratégias. Esta dissertação propõe o mindfulness como uma possível solução. Utilizando uma amostra de 96 participantes, este estudo explora a relação entre mindfulness disposicional, comportamento de economia circular e disponibilidade para pagar (WTP) por produtos circulares, bem como o impacto de uma breve intervenção de mindfulness no comportamento de economia circular e WTP. Além disso, examina se a percepção da eficácia do consumidor (PCE) e a perspetiva de tempo futuro (TP) medeiam a relação entre o mindfulness e o comportamento de economia circular ou a WTP. Os resultados revelam que o mindfulness disposicional prevê positivamente o comportamento da economia circular, alinhando-se com pesquisas anteriores sobre a correlação entre mindfulness e consumo sustentável. O estudo também demonstra que uma breve intervenção de mindfulness pode melhorar o comportamento de economia circular, uma vez que o grupo de intervenção de mindfulness relatou níveis mais elevados de intenções comportamentais de economia circular em comparação com um grupo de controlo aleatório. No entanto, o estudo não encontrou uma relação significativa entre a atenção plena disposicional e a WTP para produtos circulares, sugerindo que os indivíduos atentos podem não estar necessariamente mais dispostos a pagar por produtos circulares. A ausência de mediação direta entre a atenção plena disposicional e o comportamento de economia circular ou a WTP realça a necessidade de uma investigação mais aprofundada sobre factores mediadores alternativos. O estudo contribui para o campo emergente do mindfulness nos contextos da sustentabilidade e da economia circular e oferece perspectivas para os decisores políticos, empresas e investigadores que procuram promover comportamentos de economia circular.

Palavras-chave: Mindfulness, Economia Circular, Disposição para Pagar, Consumo, Eficácia Percebida pelo Consumidor, Perspetiva Temporal

Acknowledgements

In the quiet solitude of academic contemplation, I find myself reflecting on the journey that has brought me to this point. A journey that began with empty pages and a head full of questions ended with good memories and a ready-to-submit dissertation.

All this would be not possible without the guidance of Professor Cláudia Simão. I want to sincerely thank you for your dedication to being the best supervisor possible, and for your guidance and continuous help. Your insightful comments, helpful criticism, and patience have all been crucial. Also, you gave the best prep talks, and I sure needed them.

To my cherished family and friends, you have been offering unwavering support and companionship on this academic odyssey. I want to express my gratitude to Samantha and Gwen. Thank you, angels, for companionship in the long hours of diverse libraries and cafes. Special thank goes to Elias for being my biggest critic, but also a shoulder to rest on.

I extend my heartfelt appreciation to all those who have played a part, no matter how small, in the creation of this dissertation. Thank you and Obrigada.

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“Our life is shaped by our mind, for we become what we think” - Buddha

Introduction

The far-reaching impacts of climate change spare no region across the globe, as rising temperatures continue to exacerbate a range of detrimental consequences (UN, 2023). As stated in a report by the World Meteorological Organization (WMO) in September 2019, global temperatures have already surpassed the one-degree Celsius mark compared to preindustrial levels, approaching a threshold that scientists deem ‘unacceptably risky’. The consequences include environmental degradation, heightened occurrence of natural disasters, extreme weather events, increased vulnerability to food and water shortages, disruptions to economic stability and much more. These interconnected consequences of climate change effects are further aggravated by rapid population growth. By 2030, the global population is projected to witness an influx of 5.6 billion new middle-class consumers. This demographic shift will significantly increase the demand for various consumer goods, including energy, water, clothing, and more, ultimately straining natural resources (The World Counts, 2023). Should current population growth trends persist, the availability of natural resources will become insufficient to support the existing standards of living by 2050, as indicated by the United Nations Environment Programme (UNEP, 2020). As the population continues to expand, there is a parallel surge in the generation of waste, reflecting the challenges associated with managing the escalating volumes of discarded materials. The repercussions of waste disposal are far-reaching and enduring, as discarded items do not simply vanish and their environmental consequences persist for generations to come. Developing nations frequently struggle with the issue of water contamination brought on by the inappropriate disposal of electrical and plastic trash in areas without effective recycling facilities. According to the UNEP (2017), this pollution poses a major hazard to both people and wildlife and has detrimental effects.

In light of these challenges, there is an urgent need to not only comprehend the gravity of the situation but also to intensify efforts in search of comprehensive solutions to mitigate and adapt to the effects of climate change and overconsumption. In response, one promising approach that has gained increasing attention is the concept of a circular economy. In March 2020, the European Commission embraced the Circular Economy Action Plan (CEAP) as a pivotal component of the European Green Deal, which outlines Europe’s vision for sustainable

development and progress (European Commission, 2023). The concept of a circular economy entails a fundamental shift in how we create value, aiming to disconnect it from the generation of waste and the utilization of resources. By radically transforming our systems of production and consumption, the goal of a circular economy is to minimize waste and optimize resource utilization, fostering a more sustainable and efficient approach to economic activity (Camacho-Otero et al., 2018). Circular economy provides the necessary tools to address climate change and biodiversity loss concurrently, while also meeting critical social needs. It enables the potential for economic growth, while simultaneously reducing greenhouse gas emissions, waste generation, and pollution levels (Ellen MacArthur Foundation, 2023). Research findings indicate that by adopting circular economy practices in key industrial materials such as cement, steel, plastics, and aluminium, there is potential to achieve a 40% reduction in global greenhouse gas (GHG) emissions by 2050. Furthermore, incorporating circular approaches within the food system could contribute to even greater reductions, with the potential to reach up to a 49% decrease in global GHG emissions (UNDP, 2023).

The existing literature on circular economy focuses primarily on its effects on production, including an examination of circular business models, techniques for creating circular value propositions, and the resulting advantages (Rizos et al., 2017; Wijkman & Skånberg, 2015). The importance of consumption and the role consumers play in the circular economy, however, seems to be underappreciated. Although Hobson and Lynch (2016) have proposed that the circular economy could significantly alter the lives of individuals, there remains a limited understanding of these potential transformations within the academic research and in the policies advocating circular economy (Camacho-Otero et al., 2018). These changes entail adopting behaviours such as repairing and returning goods, buying circular products, recycling, and participating in a shared economy. As a result of these changes, consumption issues, such as the acceptance by consumers, have been recognized by Camacho-Otero et al. (2018) as significant factors impeding the proliferation of circular business models. Concentrating exclusively on the technological facets of a socio-technical challenge is unlikely to lead to a successful transition towards a circular economy (Ceschin & Gaziulusoy, 2016). According to a recent report by Kirchherr et al. (2017), the lack of consumer interest and awareness constitutes a "main impediment regarding a transition towards circular economy" (p. 7).

Considering the substantial influence of consumer on circular economy, there is a growing pursuit among researchers and policymakers to find strategies that foster more sustainable consumer behaviours. This quest has been likened to a ‘holy grail’ by Kenis and Mathijs (2012), highlighting its significance and the challenge it presents. Theories of human behaviour, such as the Theory of Planned Behaviour (TPB) introduced by Ajzen in 1985, have been instrumental in exploring the relationships between variables and consumption behaviour. The TPB emphasizes the influence of behavioural intentions and environmental factors on actual behaviour. However, despite the insights gained from understanding these variable-effect relationships, studies have shown that they only result in a modest 21% reduction in resource consumption (Randolph & Troy, 2008; Winett et al., 1982) and fail to achieve sustained long-term behavioural change (World Health Organization, 1996). This challenge is often referred to as the attitude-behaviour gap (Kollmuss & Agyeman, 2002).

Addressing the attitude-behaviour gap and fostering more sustainable consumer behaviours is crucial in the quest for a successful transition to a circular economy. A potential solution that has garnered increasing attention is the practice of mindfulness (Ericson et al. 2014; Geiger et al. 2019). According to Langer (1992), the general definition of mindfulness is a “state of conscious awareness where an individual is implicitly aware of the context and content of information” (p. 289). Embracing mindfulness enables the cultivation of thoughtful and conscious behaviours, driven by deliberate choice and consideration of the consequences of consumption (Y. Kang et al., 2013). Research has indicated that the practice of mindfulness can positively influence an individual’s sustainable consumption practices by transforming their existing beliefs, values, and habits (Bahl et al., 2016). By cultivating mindfulness, individuals become more conscious of their choices and are empowered to make deliberate decisions that align with their environmental values. For instance, they may choose to opt for a recycled product instead of buying a new one, demonstrating a conscious effort to reduce waste and promote circularity.

Mindfulness can also be used as a technique for training the mind that enhances conscious living and awareness (Tang et al., 2017). The literature suggests that mindfulness can facilitate a shift in thinking and behaviour in response to social and environmental crises (Carroll, 2016; Ericson et al., 2014). However, there is limited and fragmented research on the connection between mindfulness and sustainability (Dhiman & Marques, 2016; Ericson et al., 2014; Koger, 2015; Sol & Wals, 2015; Wamsler et al., 2017). Particularly in the context of

circular economy, there is a lack of available studies examining mindfulness. Nevertheless, constructs such as perceived consumer effectiveness (PCE) and time perspective (TP), specifically future orientation, may serve as potential bridges between mindfulness and circular economy. These constructs, which are fostered through mindfulness practices, have been shown to influence pro-environmental behaviour and sustainable consumption (Helm & Subramaniam, 2019; Wittmann & Sircova, 2018). PCE is defined as an “individual’s estimation of how their personal consumption activities contribute to solving environmental problems” (Berger & Corbin, 1992, p. 80). TP is defined as “the often-nonconscious process whereby the continual flows of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events” (Zimbardo & Boyd 1999, p. 1271). Whereas future TP is connected to structuring objectives and principles of behaviours that have the potential to impact future results (Zimbardo & Boyd 1999).

As the circular economy gains momentum as a potential solution, understanding and influencing consumer behaviours becomes a central challenge and a vital opportunity for researchers, businesses, and policymakers alike. This paper aims to establish and strengthen the evidence base regarding the effectiveness of mindfulness in promoting circular economy behaviour. The following research questions are addressed: Does a mindfulness disposition positively predict circular economy behaviour? Are participants more inclined to participate in circular economy after a brief mindfulness intervention? Is the effect of dispositional mindfulness on circular economy behaviour mediated/moderated by time perspective and perceived consumer effectiveness? By identifying the mediating variables between mindfulness and circular economy, we can advance and consolidate the understanding of how mindfulness practices can contribute to sustainable consumption. This study is ground-breaking in its contribution to the field as it is the first to provide empirical evidence of the impact of a brief mindfulness intervention on circular economy behaviour. Additionally, it is the first study to test time perspective and perceived control effectiveness as mediators in the relationship between mindfulness and circular economy behaviour.

The findings of this study provide valuable insights and lay the groundwork for future research in this emerging field. Policymakers, organizations, and other stakeholders can rely on these insights to develop targeted interventions, strategies, and policies that promote mindfulness-based approaches in fostering circular economy behaviours. Interventions and educational programs based on mindfulness can be adopted to increase people’s awareness,

empower them to make deliberate decisions, and close the gap between attitudes and behaviours. By integrating mindfulness into the context of sustainable consumption and the circular economy, individuals can develop a deeper understanding of the interconnectedness between their choices, the environment, and societal well-being. As Buddha wisely stated, "Our life is shaped by our mind, for we become what we think".

This paper is structured into four distinct chapters, each contributing to the exploration and understanding of the relationship between mindfulness and circular economy behaviour. The first chapter begins with the literature review, delving into the theories and methodologies that have been applied in the study of circular economy. This literature review emphasizes the current status of research and contributes to building a foundation of knowledge base. Additionally, it sets the stage for the following portions of the study by revealing the shortcomings and gaps in the existing literature. Building upon the identified research gap, the ensuing section focuses on the concept of mindfulness and its potential as a transformative approach to address the challenges of circular economy behaviour. Mindfulness is defined and examined concerning its role in promoting sustainable consumption and pro-environmental behaviours. The links between mindfulness, time perspective, perceived consumer effectiveness, and consumer behaviour are explored in depth, shedding light on the mechanisms through which mindfulness may positively impact circular economy behaviour.

The second chapter is the methodology. It discusses the empirical investigation and delves into detail about the sample population, the measurement tools utilized, the research procedures, and the data analysis techniques used. This empirical study offers important insights into how mindfulness and circular economy practices are related, providing data to back up the previously described theoretical underpinnings. The study's findings are then presented and illustrated in the third chapter of the report, which is followed by a detailed analysis of them.

The fourth chapter discusses the findings and offers tangible solutions for individuals, businesses, policymakers, and educators on how mindfulness can encourage sustainable consumption, promoting a shift towards circular economy. The chapter ends by reflecting on the study's shortcomings and by offering ideas for future research.

1 Literature Review

1.1 Circular Economy and Consumption Behaviour

The concept of ‘Circular Economy’ has emerged as a focal point in discussions and initiatives focused on shifting systems from resource depletion and unsustainable consumption patterns towards enhanced environmental sustainability (Hobson et al., 2021). Despite the widespread adoption of the circular economy concept among scholars and professionals, there remains a lack of consensus regarding its precise definition (Camacho-Otero et al., 2018). Singh and Giacosa (2019) define it prominently as follows:

“Circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the ‘end-of-life’ concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models”. (p. 922)

However, this definition seems to focus primarily on the production side and neglects the other side of the product life cycle – the involvement of consumers. In contrast to the linear economy, circular economy recognizes the crucial role of consumers as active participants, as highlighted by Mylan et al. (2016) and the Ellen MacArthur Foundation (2023). Despite this realization, recent relevant literature has not fully addressed this issue in a comprehensive manner. Geissdoerfer et al. (2017) explored the link between sustainability and circular economy but made no significant mention of consumers or consumption components. Moreover, Kirchherr et al. (2017) discovered that only a small percentage of papers defining circular economy (19%) consider consumption. This emphasises the under-researched role of consumers in a circular economy context. Kirchherr et al. (2017) addressed this critique by expanding the definition of circular economy as an:

“economic system that replaces the ‘end-of-life’ concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks), and macro level (city, region, nation, and beyond), with the aim of accomplishing sustainable development, thus simultaneously creating environmental

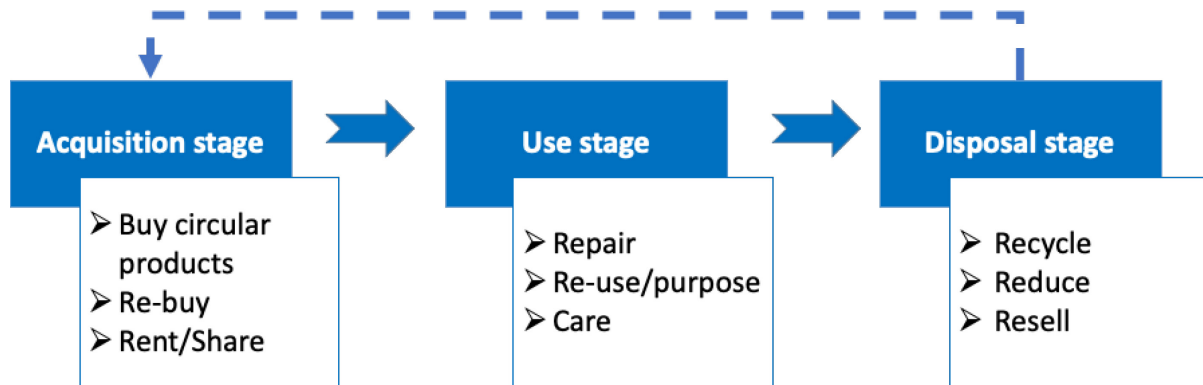
quality, economic prosperity and social equity, to the benefit of current and future generations. It is enabled by novel business models and responsible consumers”.
(p. 229)

This definition draws attention to the enabling roles played by consumers as one of the key drivers of the circular economy paradigm. In line with Kirchherr et al.’s (2017) conceptualization, consumers embedded within the circular economy paradigm go beyond a mere utilization of products or services; they actively participate and shape supply and demand. Within this active involvement in the circular economy, as discussed by Muranko et al. (2019), consumers adopt behaviours that prioritize resource efficiency and seek to reduce adverse impacts on the environment, economy, and society. This includes contributing to recycling efforts, participating in repair, maintenance, and upcycling activities, as well as embracing second-hand, refurbished, or repaired products (Lehner et al., 2020; Mugge et al., 2017).

Proactive circular consumer behaviour effectively promotes an efficient utilization of resources throughout the various stages of consumption (Gomes et al., 2022). Circular consumption stages encompass the acquisition, utilization (use), and disposal of circular products (Gomes et al., 2022). According to Muranko et al. (2019), these transactional processes can be understood as behavioural chains, representing a series of distinct and consecutive actions carried out during the consumption of a circular product or service. Therefore, within the framework of circular economy, the authors anticipate consumers to engage in a range of behaviours that facilitate circular consumption (Camacho-Otero et al., 2020; Ellen MacArthur Foundation, 2023; Rabiú & Jaeger-Erben, 2022). Figure 1 illustrates the circular economy behaviours associated with each stage of consumption.

Figure 1

Circular economy behaviours associated with each stage of consumption



Note: The figure is illustrated by Julia Evseev

The acquisition stage within circular economy comprises purchasing goods and services that, when compared to equivalent products fulfilling the same function, have the least negative environmental effects. Individuals are expected to engage in behaviours such as purchasing used products, renting items, or buying refurbished or recycled products. Gomes et al. (2022) ascertain that the adoption of recycled or remanufactured products by consumers is closely linked to their “acceptance and engagement with the product life cycle extension/reuse in circular business models” (p. 5). There is a multitude of research (Gomes et al., 2022) supporting this claim with regards to certain products, such as clothing (Baier et al., 2020), bicycles (Gan & Chen, 2019), and electrical and electronic equipment (Feng et al., 2021; Kuah & Wang, 2020). Moreover, the acquisition stage also comprises renting or sharing products and services through physical (Kuah & Wang, 2020) or digital (Esmailian et al., 2020) platforms.

During the use phase, consumers can extend product ownership and contribute to renewing the value of the product and extending its lifespan. This involves actions such as repairing, retaining, repurposing, reusing and caring for a product. Care practices have been found to have a significant impact on the lifespan of a product, as well as influencing repair and maintenance schedules (Didi & Yan, 2019).

In the disposal phase, consumers engage in activities that facilitate the circulation of goods, such as returning items to the system, reselling them to other consumers, or reducing waste. The reduction in consumption, for example in the fashion industry, is demonstrated to be a vital behaviour for the efficient transition to circular economy (Baier et al., 2020). This behaviour has also been discussed in the context of municipal purchases and the construction sector (Campbell-Johnston et al., 2019).

The circular economy behaviours during the three stages comprise the consumption side of circular economy and their adoption contributes to the transition to circular economy. However, Rabiou and Jaeger-Erben (2022) observed that a common finding across the articles they reviewed was that these did not encompass all consumption stages. Moreover, most of the articles only focused on the use and the disposal stage. In addition, Elzinga et al. (2020) stress the significance of the acquisition stage in circular economy, particularly in the context of circular business models, which rely on consumer demand for circular products. Circular products are characterized by being produced with recycled materials or by possessing extended lifecycles (Pretner et al., 2021).

Despite the vital role consumers play in driving demand, there remains limited knowledge regarding consumers' willingness to pay (WTP) for such products. WTP is the highest price a customer will pay for a specific quantity of products and serves as a direct indicator of how much value consumers genuinely place on a product in terms of its utility (Le Gall-Ely, 2009; Pretner et al., 2021). Tully and Winer (2014) argued that consumers are willing to pay more for goods that demonstrate benefits to society and the environment. Contrasting studies, however, indicated that consumers pay comparatively less for goods that have been recycled, refurbished, or reused (Guide & Li, 2010; Michaud & Llerena, 2011). For instance, a study by Pretner et al. (2021) proposes that consumers value circular products less, particularly those crafted from recycled materials or sourced second-hand. Even though these circular products carry substantial pro-environmental merits, consumers could potentially perceive them as possessing lower quality attributes (Magnier et al., 2019). To address the identified research gaps, this paper will adopt all of the aforementioned circular economy behaviours and WTP for circular products as the dependent variables in its research design.

In summary, the transition to a circular economy signifies a transformation in consumer behaviour, shifting from thoughtless consumption to the deliberate acquisition of circular products with positive environmental attributes. This shift, combined with the adoption of extended life cycle behaviour within the circular economy, plays a pivotal role in reducing the usage of energy and raw materials, as highlighted by Camacho-Otero et al. (2020). To address these challenges effectively, a comprehensive understanding of the factors influencing consumer behaviour is essential. The subsequent section provides an overview of the existing literature on this topic.

1.2 Changing Consumption Patterns

Researchers in the field of consumption have employed various theoretical frameworks to investigate the drivers of consumer behaviour and strategies for promoting sustainable consumption (Camacho-Otero et al., 2018). In the early stages of research, the primary focus was on examining the individual characteristics of environmentally conscious consumers, aiming to identify and segment those who are concerned about the environment or hold sustainable values (Trudel, 2018). Consequently, characteristics such as age, gender, and economic background have been linked to measures of social consciousness and environmental concern (Anderson & Cunningham, 1972; Fisk, 1973; Trudel, 2018). For instance, Anderson and Cunningham (1972) developed a typology of socially conscious consumers by examining the demographic and socio-psychological characteristics of consumers and establishing correlations between these consumer attributes. Later research aimed to investigate the relationship between indicators of social consciousness and environmental concern and behaviours related to the environment, such as recycling (McCarty & Shrum, 1994; Schultz et al., 1995), as well as environmental attitudes (Murphy et al., 1978) and many more. The findings from these studies yielded mixed and sometimes conflicting results (Trudel, 2018). Webster (1975), for example, noted that the measures employed by Anderson & Cunningham, (1972) showed no correlation with socially conscious behaviour.

More recent research has abandoned the investigation of demographic traits in favour of concentrating on consumer motivation and decision-making processes that underlie sustainable behaviour (Trudel, 2018). One of the pioneer theories in this field is the rational choice theory. According to the rational choice theory, individuals engage in decision-making by assessing the advantages and disadvantages of a specific action, such as the acquisition of a product (Camacho-Otero et al., 2018). Based on this concept, people behave rationally through cognitive deliberation, act in their self-interest, and have predefined preferences that are unaffected by the actions of others. To put it differently, consumers are seen as logical decision-makers who carefully weigh their options before making decisions that best advance their personal interests (Jackson, 2005). For example, in the context of circular economy, if the consumer has sufficient information on a circular product, the consumer will make an informed choice in favour of this product.

Although the rational choice theory provides an important framework for gaining insights into individual decision-making processes, the Theory of Planned Behaviour (TPB)

provides a more extensive framework for understanding the complexities of pro-environmental behaviour (Jackson, 2005). Unlike the rational choice theory, which only considers utility, the TPB delves deeper into the psychological and social factors that influence a person's intentions and behaviours towards ecologically responsible choices (Jackson, 2005). TPB developed by Ajzen (1985), assumes that decision-making is driven by specific goals, expected outcomes, or rewards and claims that intention serves as a reliable predictor of behaviour. The theory acknowledges the influence of cognitive factors such as attitudes, subjective norms, and perceived behavioural control in shaping behaviour (Ajzen, 1985). Attitude is an individual's feeling about the results of engaging in an action, and a person's favourable or unfavourable assessment of these results influences their attitude. Subjective norm refers to the perception that most individuals either approve or disapprove of a particular conduct. Perceived behavioural control relates to a person's impression of how easy or difficult it is to engage in the behaviour of interest. A literature review by Camacho-Otero et al. (2018) revealed that in the consumer psychology domain, 28% of all reviewed papers applied the TPB.

The TPB, despite its wide application, falls short in explaining around two-thirds of the behavioural variance. Even though they are crucial, intentions and perceived control only account for 20–40% of the variation in behaviour (Bamberg, 2002). More recently, a cross-cultural study found that an extended TPB model could account for 56% and 32% of the variance in purchase intentions and 53% and 17% of the variance in purchasing behaviour of consumers of organic food in Germany and Chile (von Meyer-Höfer et al., 2015). Furthermore, several studies investigating the relationship between attitude and behaviour have either found marginal correlations (Bagozzi, 1978; Bagozzi & Burnkraut, 1979) or have yielded conflicting findings (Tripathi & Singht, 2016). For example, research findings indicated that consumers' favourable attitudes towards organic food often do not align with their actual purchase behaviours (Ackermann & Palmer, 2014).

Critics of TPB highlight the challenges in assuming direct connections between individuals' awareness, values, or attitudes and their actual consumption behaviours. This is often referred to as the well-known 'attitude-behaviour' or 'value-action' gap (Kollmuss & Agyeman, 2002). Consequently, consumers' attitudes may provide limited insights into their actual behaviours (Carrington et al., 2010). Steg and Vlek (2009) concur and argue that many behaviours are influenced by more automatic and emotional processes, such as routines or habits. In response to the limitations of TBP, some social researchers have advocated for

exploring new approaches to bridge the attitude-behaviour gap and enhance behavioural outcomes.

1.3 Mindfulness as a Solution

In this pursuit of novel approaches, scholars are exploring mindfulness as a potential solution (Ericson et al., 2014; Wamsler & Brink, 2018). Bishop et al. (2004) and Brown et al. (2007) argued that mindfulness can overcome the previously mentioned disadvantages of TPB by reducing emotional and cognitive habits, leading to a more flexible and objectively informed state of being. The concept of 'mindfulness' is described by the two leading schools of thought, with one drawing inspiration from Eastern Buddhist psychological concepts (Chiesa, 2013; Grossman, 2010; Kabat-Zinn, 2003), and the other primarily rooted in Western cognitive psychology (Langer, 1998, Langer & Moldoveanu, 2000).

The therapeutic applications of Eastern mindfulness emerged in the 1970s with Kabat-Zinn and his associates. Mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) are the meditation-based key interventions used to address a wide range of mental and physical conditions. In his work, Kabat-Zinn (1994) defined mindfulness as "the act of purposefully paying attention to the present moment without judgment, appreciating it, and cultivating a deep and caring connection to it through continuous discerning awareness" (pp. 8-9). Following Kabat-Zinn's definition, mindfulness is thought to include two main components. Firstly, a "self-regulation of attention", emphasizing the maintenance of focus on direct experiences (Bishop et al., 2004, p. 232). Secondly, embracing a specific approach to one's present experiences, marked by "curiosity, openness, and acceptance" (Bishop et al., 2004, p. 232). The initial element pertains to the self-regulation of attention, ensuring it remains directed toward the current moment, facilitating a greater acknowledgment of present mental events. The second element encompasses the embrace of a specific approach to one's present encounters, marked by inquisitiveness, receptivity, and a sense of acceptance.

Ellen Langer (1989) pioneered the second stream of mindfulness research, which is rooted exclusively in Western psychology. Although relatively new, Langerian mindfulness theory has been primarily developed within the framework of cognitive and information-processing theory (Helm & Subramaniam, 2019). According to Carson and Langer (2006), mindfulness is a conscious awareness, i.e., "when one is mindful, one is actively engaged in the present and sensitive to both context and perspective" (p. 30). This is contrasted by a state of

mindlessness, which includes “automatic, habitual, and superficial cognitive processing” (Hart et al., 2013, p. 454; Langer, 1989, 2005). According to Hart et al.’s (2013) assessment, Langer cautions against excessive mindlessness, which can negatively affect “performance, cognitive functions, psychological well-being, and even longevity” (p. 454; Langer, 1989; Langer & Piper, 1987). Moreover, Langer (2005) claims that mindfulness incorporates “openness to novelty” (p. 214), going beyond just being attentive to one’s surroundings. This increased awareness calls for heightened sensitivity to environmental cues, openness to new information, the development of new categories to organise observations, and acceptance of different points of view on a subject (Hart et al., 2013; Langer, 1989; Langer & Moldoveanu, 2000). As a result, mindfulness can be understood as a mindset, characterized by seeking and generating novelty, active engagement, and adaptability (Helm & Subramaniam, 2019). To cultivate mindfulness, Langer and her colleagues developed brief instructional mindfulness interventions, guiding participants to consciously regulate their thinking from mindlessness to mindfulness.

Both Langer’s (1989) and Kabat-Zinn’s (1994) concepts of mindfulness have the importance of self-regulating one’s attention in common. Nevertheless, Hart et al. (2013) emphasized that there are several fundamental differences between the two schools of thought. Apart from having their provenance in two different philosophies, their respective goals and methods to induce mindfulness diverge. Langer’s mindfulness interventions are geared towards enhancing cognitive performance and overall well-being, they are instructional, brief in duration, and don’t require ongoing commitment. On the other hand, Kabat-Zinn’s interventions are more therapeutic in nature, specifically focused on alleviating physical symptoms and psychological distress. In addition, their target audiences and settings also set them apart. Kabat-Zinn’s work primarily revolves around patients in clinical contexts, in contrast to Langer’s interventions, which predominantly engages healthy individuals in their everyday environments (Hart et al., 2013; Langer, 2000). Consequently, this study adopts Langer’s socio-cognitive perspective, as brief mindfulness interventions are easier to incorporate into an experimental setting and are more suitable for individuals in a non-clinical context.

1.3.1 Mindfulness Intervention

The research community lacks consensus regarding whether mindfulness should be categorized as a cognitive ability, cognitive style, state, or trait. Sternberg (2000) proposed that

mindfulness represents a cognitive style that reflects a preferred way of thinking. Whereas Bishop et al. (2004) view mindfulness more as a state than a trait, emphasizing that its activation and continuity depend on the regulation of attention and the cultivation of an open orientation to experience. However, more recent research suggests that mindfulness can indeed be regarded as both a personality attribute and a skill that can be enhanced through regular practice (Olendzki, 2014). Notably, studies indicated that brief mindfulness interventions, such as engaging in creative mental tasks and activities designed to disrupt mindless cognitive automaticity, can contribute to the cultivation and improvement of mindfulness (Bercovitz et al., 2017; Langer, 1989).

Several studies have conducted these ‘brief mindfulness interventions’, as described by Keng et al. (2011), also referred by Ellen Langer as ‘mindful learning’. In most of the studies, Langer and her colleagues induced a state of mindfulness by providing participants with instructions that encouraged them to be more mindful. For instance, Geng et al. (2011) used mindfulness material designed to prompt participants to approach a familiar situation from a different perspective, aiming to break their habitual mindset and encourage creative thinking. In their literature review Hart et al. (2013) summarize the findings of previous studies, stating that mindfulness has positive effects on: (1) trait mindfulness (Burpee & Langer, 2005; Djikic et al., 2008), (2) cognitive performance (Anglin et al., 2008), and (3) learning skills (Langer et al., 1989; Langer, 2000). Kahneman’s (2011) dual system theory offers a plausible explanation for how brief mindfulness interventions can trigger mindful modes of consciousness. In his theory individuals use two systems to decide. ‘System 1’ is fast and intuitive, while ‘System 2’ is slow and analytical. The attention-evoking instructions given to participants in these interventions appear to prompt self-regulation of attention, thereby activating ‘System 2’. This model aligns with the notion that self-regulating attention plays a crucial role in brief mindfulness interventions (Hart et al., 2013).

Furthermore, Langer and her colleagues (Burpee & Langer, 2005; Djikic et al., 2008; Muraven & Baumeister, 2000), highlight the importance of self-regulatory mechanisms in brief mindfulness treatments, which can help explain the increase of trait mindfulness after repeated mindful interventions. Based on the previous research by Muraven and Baumeister (2000), Hart et al. (2013) agree and state that self-control functions work like a muscle and “self-regulation exercises ... may strengthen the self- regulation muscle thereby improving one’s dispositional

self-regulatory capacities” (p. 458). The following section will explore the discussed concepts within the realm of consumer behaviour.

1.4 Mindfulness and Circular Economy

As previously established, consumers are key actors in a circular economy and, hence, a transition from a linear to a circular economy would also entail a shift in consumer consumption practices. Extensive research has illustrated that both dispositional mindfulness and mindfulness practices could potentially reshape individuals’ consumption behaviours (Amel et al., 2009; Brown & Kasser, 2005; Fischer et al., 2017; Rosenberg, 2004). Mindful individuals thoughtfully consider their actions and choices, taking into account personal well-being, community welfare, and environmental sustainability - essentially aligning with the objectives of the circular economy (PhramahaWattana et al., 2021). In other words, greater awareness of one’s thoughts can enhance awareness of the need for circular products in society and, as a result, influence purchasing behaviour. As an illustration, Barber and Deale (2014) demonstrated that individuals with higher levels of mindfulness actively seek out products and services that have a lower environmental impact.

There are three main explanations for how mindfulness can theoretically be linked to consumption. The first theoretical explanation regarding the potential role of mindfulness in promoting sustainable consumption was put forth by Rosenberg (2004): By amplifying awareness of "cognitive-behavioural processes tied to consumption that have turned somewhat automatic" (Rosenberg, 2004, p.108), mindfulness could facilitate more conscious decision-making. This is consistent with Langer’s (1992) hypothesis that mindfulness is associated with a decrease in automatic cognitive processing. Mindfulness can help individuals break free from unhelpful behavioural patterns by promoting more adaptable and objectively informed actions. In experimental settings, both Wenk-Sormaz (2005) and Moore and Malinowski (2009) supported this conclusion by demonstrating that mindfulness training diminishes automatic and habitual responses. Armstrong (2012) investigated this concept in the context of compulsive buying behaviour. She conducted a longitudinal mixed-method intervention study, which tested how compulsive buyers experience mindfulness training compared to two control conditions. The findings indicated that the crucial factor in breaking habitual behaviour was a heightened sense of awareness achieved through mindfulness training. However, one limitation impeding

the generalisability of the results is that this study employed a small sample size (N=12) for the experimental group.

In sum, the research suggests that individuals who practice mindfulness are more inclined to focus their attention and deliberately process information related to sustainable consumption, rather than trusting their habits. For instance, individuals who engage in mindful shopping could choose circular products or assess a product's packaging to determine its potential for reuse. Dhandra's (2019) correlational study provides support for the hypothesis. They found a positive link between dispositional mindfulness and green purchase intentions.

The second explanation suggests that mindfulness has the potential to close the gap between intention and behaviours (Geiger et al., 2019; Fischer et al., 2017). Prior studies have demonstrated that mindfulness can impact factors that influence the relationship between intention and behaviour, including memory, motivation, and self-control (Demick, 2000). In the realm of health behaviours, one correlational study provided evidence that a contested measure of dispositional mindfulness was linked to individuals' self-reported capacity to translate intentions into behaviours. Participants were more likely to act as they intended because they were better able to regulate their thoughts and feelings that may otherwise work against their good intentions (Chatzisarantis & Hagger, 2007). These findings indicate that mindfulness practice has the potential to mitigate the widely recognized gap between attitudes and intentions and actual behaviour in the field of sustainability, where people's positive attitudes often do not align with their actions (Geiger et al., 2019).

Thirdly, a point particularly relevant to socio-cognitive mindfulness is the capacity for embracing novelty. Langer postulated that mindfulness involves a state of "openness to novelty" or actively seeking out novel distinctions (Langer, 2005, p. 214). Given that the transition from a linear economy to a circular economy requires the introduction of novel approaches to value creation and consumption patterns, consumers must exhibit openness to new circular behaviours and products. Barber and Deale (2014) conducted an analysis of hotel guests with higher levels of dispositional mindfulness to assess their willingness to embrace suggestions for sustainable practices at various hotel locations. Their findings indicated that more mindful guests were more amenable to innovative cues related to pro-environmental behaviour (PEB). Furthermore, Siqueira and Pitassi (2016) argued that mindfulness can foster the development of cognitive abilities, attitudes, and behaviours in individuals, enabling them to identify and harness creative solutions that contribute to sustainability-oriented innovation.

To mitigate the counter-intentional habits and the intention-attitude gap, mindful learning (brief mindful interventions) as a practice has gained popularity (Geng et al., 2011). Prior research has highlighted the advantages of adopting mindful learning strategies in non-environmental areas such as the attenuation of adverse social attitudes (Djikic et al., 2008) and the enhancement of social cognitive abilities (Geng et al., 2011). Only a limited number of studies have investigated the impact of Langer's mindful learning interventions on pro-environmental behaviour, and as of now, there appears to be a lack of research investigating its effect on circular economy behaviour. One such study by Wang et al. (2016) found that mindful learning interventions can enhance connectedness to nature, by disrupting traditional cognitive patterns, allowing individuals in the mindfulness group to develop a more interactive and respectful relationship with nature compared to the control group. In addition, in the study conducted by Tang et al. (2017), participants belonging to the mindful-learning group exhibited elevated levels of pro-environmental behavioural intentions when contrasted with a randomly assigned control group.

Regarding the willingness to pay (WTP) for circular or eco-friendly products, there is a notable absence of research explicitly exploring the impact of mindfulness on WTP in this context. However, existing studies have delved into the relationship between mindfulness and environmentally conscious purchasing behaviour (Daniel et al., 2023). Traditional economic models typically assume a 'homo economicus' behaviour, where individuals prioritize cost-efficiency when two products offer the same utility. Conversely, recent research indicated that individuals with a mindful disposition tend to lean towards purchasing greener and more sustainable products (Dhandra, 2019). Tewari et al. (2021) confirmed these findings by linking mindfulness with purchase intention for organic food in India. Given that environmentally friendly products often come with higher price tags, this dissertation expects mindful individuals to be willing to pay a higher price for these products.

In summary, it is important to acknowledge the substantial research on how mindfulness relates to consumer behaviour. However, it is equally important to point out that there is a lack of research specifically examining if the mindfulness effect on consumption also relates to circular economy behaviour and the willingness to pay for circular products. The distinct role of consumers within the circular economy remains a relatively unexplored area of research, with existing literature predominantly concentrating on the implementation of circular strategies within organizational and industrial domains (Szilagy et al., 2022). Additionally, it

is worth noting that most of the existing studies in this area focus on establishing associations rather than conducting experimental investigations (Fischer et al. 2017).

The above highlights a notable gap in the academic literature. Consequently, this dissertation introduces two key ideas. First, it suggests that higher levels of dispositional mindfulness are expected to be positively associated with both circular economy behaviour and willingness to pay for circular products. Second, it proposes that mindful learning (brief mindfulness intervention) could potentially have a positive impact on both circular economy behaviour and willingness to pay. Consequently, the following hypotheses are put forward:

H1: Dispositional mindfulness positively predicts circular economy behaviour

H2: Dispositional mindfulness positively predicts willingness to pay for circular products

H3: Participants who undergo the mindfulness intervention will display a greater occurrence of circular economy behaviour than those in the control group

H4: Participants who undergo the mindfulness intervention will display a higher willingness to pay than those in the control group

This dissertation also suggests that perceived consumer effectiveness and future time perspective may play a mediating role in the relationship between mindfulness and circular economy behaviour and willingness to pay for circular products. The academic reasoning will be discussed in the following sections.

1.5 Perceived Consumer Effectiveness

Transitioning one's habitual consumption behaviour toward a more circular one presents challenges, especially when there remains scepticism about the effectiveness of individual actions in bringing about larger societal or environmental transformations. This scepticism may be overcome by increasing perceived consumer effectiveness (PCE) (Helm & Subramaniam, 2019). Hanss and Doran (2019) defined PCE as a "consumer's estimate of his or her ability to contribute to specific sustainable development-related outcomes (e.g., reducing the amount of waste) through specific behaviours (e.g., repairing broken products)" (p. 2).

The first empirical insight into PCE on the topic of sustainable consumption was provided by Kinnear and colleagues in 1974 when they adopted the concept of perceived consumer effectiveness (PCE) to address the problem of pollution reduction. The authors

observed that individual customers were more likely to exhibit concern for the environment and engage in associated purchasing behaviour if they felt they could make a difference in reducing pollution. Additional research has demonstrated that individuals with higher levels of PCE are inclined to choose organic foods, recycle waste, opt for fair trade and locally sourced food and invest in energy-efficient heating systems (Boivin et al., 2016; Gilg et al., 2005; Izagirre-Olaizola et al., 2015; Verhoef, 2005), all practices linked with circular economy behaviour. A study conducted by Roberts (1996) indicated that PCE accounted for 33% of the variance in responsible consumer behaviour, revealing its significant role in influencing consumer's choices of environmentally friendly products and services. Straughan and Roberts (1999) echoed these findings in their study with PCE explaining about 33% of the variance in self-reported ecological consumer behaviour.

Nonetheless, studies investigating PCE's connection to various consumption behaviours revealed that its predictive efficacy varies across different behavioural domains (Hanss & Doran, 2019). For example, Lee and Holden (1999) made a clear distinction between high-cost consumer behaviour, such as active membership in an environmental organization, and low-cost consumer behaviour, such as past avoidance of plastic packaging. In the same vein, Berger and Corbin (1992) found that individual endorsement of regulatory measures exhibits no association with PCE. Employing a quantitative methodology, the more recent research by Kovacs and Keresztes (2022) encompassed young consumers who completed a self-administered online questionnaire. The findings demonstrated a noteworthy difference in WTP depending on the product's sustainable attributes. Participants were ready to pay extra for certain food attributes like handcrafted, preservative-free, traditional, etc. However, more than half of the surveyed individuals expressed reluctance to pay higher prices, especially for locally sourced and organic items. These outcomes align with findings in differing areas of consumption, where the extent of variance explained by individual PCE varies widely across studied behaviours (Hanss & Doran, 2019). In sum, there is extensive evidence that PCE is linked to various consumption behaviours, but it also suggests that the relationships between PCE and consumption are intricate and context dependent. More research is needed on PCE and the effect on circular economy behaviour and willingness to pay for circular products.

Transitioning to the relationship between PCE and mindfulness, Helm and Subramaniam (2019) propose that mindfulness can serve as a valuable tool for nurturing the cognitive patterns essential for an individual's self-efficacy. Self-efficacy is defined as the

belief that one can effectively carry out the behaviours necessary to achieve desired results (Bandura, 1977) and is positively correlated with PCE (Sharma & Dayal, 2017). Concurrently, studies show that mindfulness can heighten perceived control and efficacy beliefs (Gilbert & Waltz, 2010). This results from an increased awareness of thoughts and emotions, enabling shifts in perspective (Pagnini et al., 2016). Consequently, mindful individuals are more likely to believe in their capacity to influence outcomes, promoting engagement in sustainable consumption. For instance, those practising mindfulness might confidently believe that modifying consumption habits can reduce their environmental impact. Their heightened sensitivity to choices and altered perspectives facilitate this belief (Helm & Subramaniam, 2019). Hence, in the context of sustainable consumption behaviour, self-efficacy and perceived control are generally equivalent to PCE, which explains the connection between mindfulness and PCE (Helm & Subramaniam, 2019).

Helm and Subramaniam (2019) established that PCE mediates the effect between mindfulness and consumption behaviour. Consequently, mindfulness as an initiative to strengthen PCE might help overcome the existing gap between positive attitudes toward sustainable consumption and individual action, and thereby advance the transformation of consumer behaviour towards circular economy. Based on this assertion, this dissertation aims to investigate whether PCE mediates between mindfulness and circular economy behaviour as well as WTP for circular products.

1.6 Time Perspective

The European Circular Economy Action Plan (CEAP) aims to promote sustainable and circular consumption behaviours, which inherently involve navigating a complex dilemma. This dilemma is rooted in both temporal and interpersonal conflicts, as individuals must reconcile short-term self-interest with long-term common interests (Wittmann & Sircova, 2018). As discussed by Parfit (2013), this challenge is closely tied to our psychological perception of time, influencing our decisions regarding choices that cater to immediate self-interest versus those that contribute to the long-term common good. People frequently regard the time before a positive outcome as a cost to be balanced against the advantages, favouring instant rewards over delayed ones (Read, 2001). In an economic setting, this concept entails that people frequently trade off time and money, such as when deciding between quicker, more expensive delivery choices and slower, less expensive alternatives (Hantula & Bryant, 2005). Individual

differences in time perspective imply that personality must be taken into consideration to comprehend temporal conflicts in consumer behaviour (Wittmann & Sircova, 2018).

According to Karniol and Ross (1996) there are three distinct time perspectives - past, present, and future - and noticeable variations in how individuals prioritize one of these perspectives when making life decisions. Zimbardo and Boyd (1999) build on this foundation and introduce five timeframes to characterize an individual's perspective on the present, past, and future: Past Positive, Past Negative, Present Hedonistic, Present Fatalistic and Future. Individuals with a past positive time perspective tend to hold positive mental images of the past and engage in reflective, contemplative thoughts about past experiences, in contrast past negative hold negative views of the past. The present hedonistic perspective is centred around seeking pleasure and living in the moment, where present fatalistic individuals feel helpless about the present. On the other hand, individuals with a future time perspective (TP) tend to have meaningful mental images of future events and are motivated by these ideas (Zimbardo & Boyd, 1999). Accordingly, future-oriented individuals tend to demonstrate concern for the environment and take action to address environmental issues (Milfont et al., 2012).

Future TP was shown to be a better predictor of pro-environmental behaviour than possessing environmentally favourable attitudes, as shown by a worldwide meta-analysis that included 19 studies from seven different countries (Milfont et al., 2012). For example, individuals with a future-oriented mindset demonstrated a greater capacity for forward-thinking in their consumption choices (Lennings & Burns, 1998) and were more likely to engage in water conservation practices (Corral-Verdugo et al., 2006). The degree to which behaviour is described by future orientation is still modest to low, and it is crucial to keep in mind that these conclusions are based on correlations. However, individuals with higher levels of future orientation are more likely to adopt pro-environmental strategies when faced with ecological resource scarcity due to their ability to consider future consequences and delayed rewards. This hypothesis has been indirectly supported by earlier research, such as the study by Gu et al. (2015), which found greater connections between perceived air pollution and intentions for pro-environmental behaviour among persons with a more pronounced future TP.

Results on the effect of future TP in intention-behaviour consistency are particularly intriguing. Van Ittersum (2012) investigated the disparity between the intention to acquire GPS cell phone technology and the actual purchase behaviour that followed. The outcomes revealed that intentions alone effectively predicted around 60.2% of subsequent purchases within the

entire group. However, when focusing on individuals classified as future-oriented, intentions accurately predicted a remarkable 84.2% of their subsequent purchases. According to these findings, people with a future TP demonstrate a significantly stronger consistency between their intentions and actual behaviour, specifically when using new technologies. This finding has great potential for the circular economy since it suggests that fostering future TP among consumers could increase their willingness to engage in circular economy behaviour.

Ge et al. (2019) shed light on the relationship between mindfulness and TP. When viewed as a personality trait (disposition), mindfulness has been linked to various time-related personality traits. These include daily time management, effective self-control over time and a heightened future-oriented perspective (Wittmann et al., 2014). Muro et al. (2017) showed that mindfulness significantly and positively correlates with future time perspective. Research by Samani and Busseri (2019) found that higher levels of mindfulness were linked to increased attention towards one's future life. Similarly, Atance and Meltzoff (2007) have highlighted a significant aspect of human future thinking, noting that we can anticipate a desire or goal state in the present and actively strive to attain it. Mindfulness involves directing one's focus towards current experiences and events, encompassing thoughts, emotions, and desires at a particular moment (Segal et al., 2002). It is plausible that individuals with greater mindfulness recognize the importance of considering their future lives to make the most of their present life. This entails setting goals and planning how to achieve them in their daily routines (Oettingen & Mayer, 2002; Pronin et al., 2008).

Nevertheless, the current research regarding mindfulness and temporal disposition is scarce and inconclusive, notably about the future orientation. For example, although Drake and colleagues' study in 2008 indicated a positive relationship between the future time frame and dispositional mindfulness scores, this relationship did not achieve statistical significance. More studies are needed to understand this relationship. Therefore, this study aims to explore how future orientation influences the link between mindfulness and circular economy behaviour and willingness to pay for circular products. It is hypothesised that a mindful individual recognizes the significance of engaging in pro-environmental actions, because of the resulting heightened orientation towards the future. They thereby may more actively demonstrate behaviours, such as purchasing circular products, to progress towards their long-term goal of promoting circular economy, even if it requires extra effort in the present.

H5: Perceived consumer effectiveness and future time perspective mediates the relationship between mindfulness and circular economy behaviour.

H6: Perceived consumer effectiveness and future time perspective mediates the relationship between mindfulness and willingness to pay.

1.7 Research Objectives and Framework

Most research on mindfulness and sustainability has been cross-sectional, which makes it difficult to draw causal conclusions (Rau & Williams, 2016). Furthermore, research examining the impact of mindful learning on sustainable consumption is scarce. There is no research on its effect on behaviours that promote a circular economy and no information if more mindful people are also willing to pay more for circular products. Lastly, to the best of my knowledge, no research has examined the indirect effects of mindfulness on circular economy behaviour and willingness to pay through perceived consumer effectiveness and time perspective.

This experimental design aims to address the identified research gap and contribute to our understanding of the impact of mindfulness interventions on circular economy behaviours. It commences by investigating the potential positive relationship between mindfulness, circular economy behaviour, and willingness to pay (WTP) for circular products. Additionally, it explores whether a brief mindfulness intervention can enhance circular economy behaviour and WTP, with an expected mean difference between the mindfulness and control groups. Moreover, the study seeks to ascertain whether perceived consumer effectiveness (PCE) and future time perspective (TP) orientation act as mediators between mindfulness and both circular economy behaviour and WTP for circular products. The primary dependent variables under examination are circular economy behaviour and WTP, while the primary independent variables include the intervention condition (mindfulness or control group) and participants' mindfulness disposition. In addition, the study considers potential mediating factors such as PCE and future TP perspective. The following hypotheses reflect the above-described objectives:

H1: Dispositional mindfulness positively predicts circular economy behaviour

H2: Dispositional mindfulness positively predicts willingness to pay for circular products

H3: Participants who undergo the mindfulness intervention will display a greater occurrence of circular economy behaviour than those in the control group

H4: Participants who undergo the mindfulness intervention will display a higher willingness to pay than those in the control group

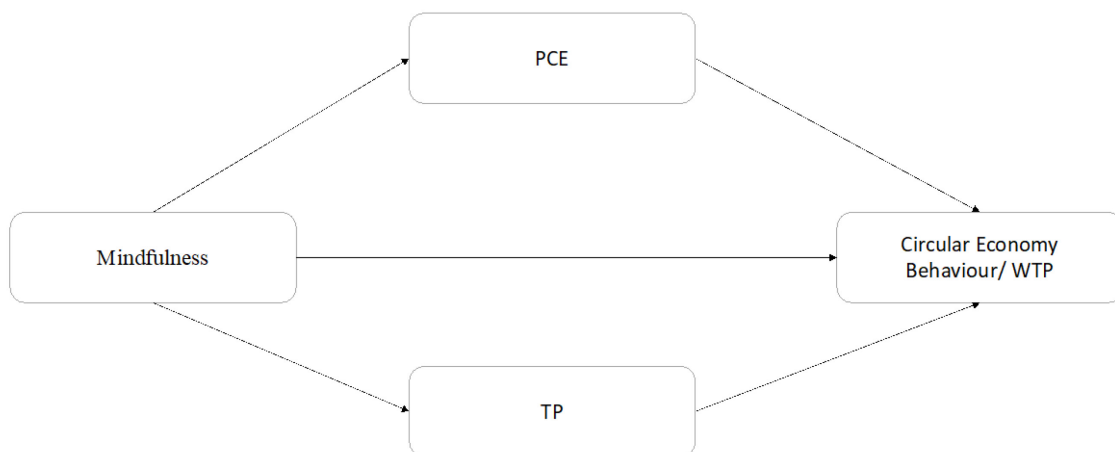
H5: Perceived consumer effectiveness and future time perspective mediates the relationship between mindfulness and circular economy behaviour.

H6: Perceived consumer effectiveness and future time perspective mediates the relationship between mindfulness and willingness to pay.

Figure 2 presents the conceptual framework of the study, which was based on a thorough examination of the literature and the developed hypotheses.

Figure 2

Hypothesized relationships between mindfulness, PCE, TP, circular economy behaviour and WTP.



2 Methodology

This section presents a thorough breakdown of the procedures used in this study, including design, participant selection, procedural information and the techniques used for data collecting and analysis.

2.1 Participants

The study employed a convenience sampling approach. Participants were recruited through word of mouth as well as social media platforms such as Instagram and LinkedIn. No inclusion or exclusion criteria were applied for the study. The required sample size for this investigation was determined by a power analysis. With a significance level (alpha) of 0.05 and a target power level (1 - beta) of 0.80, which denotes an 80% probability of detecting the impact, it was intended to find a modest effect size (Cohen's $d = 0.5$). A two-sample t-test was the statistical test of choice for this investigation. A minimum sample size of 102 individuals (51 each group), according to the power analysis performed using G*Power software (Faul et al., 2007), was required to obtain the appropriate statistical power. A total of 120 participants started the survey from which only 96 participants completed the whole survey. Therefore, 42 (43.8%) males and 53 (55.2%) females and 1 (1%) other, ranging in age from 16 to 59 years were included. The average age of the participants was 26.83 years, with a standard deviation of 6.95. The median age was 26. From the participants 2 (2.1%) had less than a high school diploma, 7 (7.3%) had high school degree or equivalent, 5 (5.2%) had some college degree, 2 (2.1%) had an associate degree, 40 (41.7) had a bachelor's degree, 38 (39.6%) had a master's degree and 1 participant (1%) had a doctor degree. From the participants 41 (42.7%) were employed full time, 8 (8.3%) were employed part time, 9 (9.4%) were unemployed, 32 (33.3%) were students and 5 (5.2%) were self-employed. The participants were not monetarily compensated.

2.2 Design and Procedure

This study employs an experimental post-test only control group design, utilizing a between-groups comparison methodology to investigate the impact of a brief mindfulness intervention on participants' responses. The applied mindfulness intervention aligns with the mindfulness intervention used by Geng et al. (2011). This intervention seeks to enhance

participants' cognitive flexibility and receptivity to novel information by prompting shifts in their mental states. The mindfulness condition (N=56) involves engaging in activities such as free association (crafting a narrative inspired by a series of images), multi-perspective thinking (generating ten distinct applications of water), and categorization (classifying ten items based on various criteria). The mindlessness condition (N=40) included categorization questions (e.g., categorizing fruits and animals), true-false questions (e.g., "Dublin is the capital of Ireland"), and providing responses from a uni-perspective (e.g., describing three basic functions of water). The duration of both conditions lasted approximately 15 min. Moreover, mindfulness disposition was measured to explore the relationship between mindfulness, circular economy behaviour, willingness to pay, perceived consumer effectiveness and future time perspective.

The data collection instrument utilized for this study was an online survey hosted on the Qualtrics platform. At the beginning, the participants were required to fill out the informed consent form (see Appendix A) and the nature of the study was explained. The total duration of the survey lasted between 15 and 20 minutes. After the demographic's questions, the participants were randomly divided into a control group (N=56) and a mindfulness group (N=40)¹. Subsequently, participants were exposed to either mindlessness material or mindfulness material.

Following this, all participants completed the Langer Mindfulness Scale to measure the dispositional mindfulness and the Short Zimbardo Time Perspective Inventory to measure the time perspective. Next, the participants had to fill out questions about perceived consumer effectiveness. Lastly, participants had to indicate circular economy behaviour and their willingness to pay for circular products.

2.3 Materials

2.3.1 Sociodemographic Data

To gather sociodemographic information from participants, a questionnaire was used to collect information on gender, age, educational background and employment status.

¹ The difference in size resulted from the fact that some participants in the mindfulness group did not fill out the whole survey and were therefore excluded.

2.3.2 Langer Mindfulness Scale (LMS)

In this non-clinical social context, a shortened version (LMS-14) (Pirson et al., 2018) of the LMS was employed to assess socio-cognitive mindfulness. The original version of the LMS was developed by Langer (1989) and intended to measure an individual's dispositional mindfulness level. The scale encompasses three dimensions: novelty seeking, engagement, and novelty producing, all of which pertain to individuals' interactions with products. Participants rated the LMS items on a seven-point Likert scale, where 1 signifies strong disagreement and 7 indicates strong agreement. It is important to highlight that the study deliberately avoided using the term 'mindfulness' in any context to evade confusion and desired responses. Earlier research has substantiated the reliability and validity of the LMS as a measurement instrument (Wang et al., 2016; Geng et al., 2011). LMS 14 (see Appendix B) exhibited a significant and moderate correlation with other mindfulness assessments, including MAAS and FFMQ. The internal consistency of this measure in this study is satisfactory, with an alpha coefficient of .78.

2.3.3 Perceived Consumer Effectiveness Scale (PCE)

A consumer's perception of their ability to influence specific sustainable consequences through their buying decisions is known as perceived consumer effectiveness (Hanss & Doran, 2019). The PCE scale used in this study was adapted from J. Kang et al. (2013) and Di Iorio et al. (2022). The original items underwent slight modifications to more effectively encompass additional informative facets linked to circular economy. Based on the research by (Hanss & Doran, 2019), it can be concluded that PCE is a stronger predictor for specific consumption behaviours when the scale is operationalized with explicit reference to these behaviours. For example, one item read: "*By purchasing circular products or services, each consumer's behaviour can have a positive effect on the environment and society*". For exact modification see Appendix C. PCE was conceptualized as the degree to which a consumer perceives their personal ability to address circular economy through their individual efforts and everyday consumption choices (J. Kang et al., 2013). The construct was measured on a 7-point Likert scale (1=strongly disagree; 7=strongly agree), with a good reliability index ($\alpha = .80$).

2.3.4 Short Zimbardo Time Perspective Inventory – 15 (SZTPI-15)

The ZTPI-15 (Zhang et al., 2013) is a shortened version of the original ZTPI Inventory (Zimbardo & Boyd, 1999), which originally comprises a 56-item questionnaire. The ZTPI-15 encompasses five distinct facets: past positive (PP) (*“Happy memories of good times spring readily to mind”*), past negative (PN) (*“Painful past experiences keep being replayed in my mind”*), present hedonistic (PH) (*“I make decisions on the spur of the moment”*), present fatalistic (PF) (*“Often luck pays off better than hard work”*), and future (F) (*“When I want to achieve something, I set goals and consider specific means for reaching those goals”*); see Appendix D for the full scale. Respondents indicate on a five-point Likert scale, ranging from 1 (strongly untrue of me) to 5 (very true of me), the extent of applicability for each statement.

The abbreviated version of the ZTPI demonstrates strong psychometric properties and serves as a reliable substitute for the complete ZTPI (Zhang et al., 2013). The future subscale of ZTPI-15 presented adequate reliability (Cronbach’s alphas: $\alpha = .67$).

2.3.5 Circular Economy Behaviour

To assess participants’ engagement in circular economy behaviours, a questionnaire adapted from the ‘Behavioural Study on Consumers’ Engagement in the Circular Economy’ by the European Commission (Cerulli-Harms et al., 2018) was introduced. These questions were further informed by the research of Rabiou & Jaeger-Erben (2022), ensuring their relevance and reliability in the context of the study.

The questionnaire² was designed to capture participants’ likelihood of engaging in general circular economy practices across all three phases of consumption: acquisition, use, and disposal. Each item presented a specific behaviour in one of the phases associated with the circular economy, such as “resell your unwanted possessions”. Participants were asked to rate their likelihood of engaging in each behaviour in the near future on a 7-point Likert scale, with responses ranging from 1 (extremely unlikely) to 7 (extremely likely). The internal consistency was $\alpha = .79$. For a complete list of the circular economy behaviour questions used in this study, please refer to Appendix E.

² The scale was comprised of 14 items, but was divided into a sub scale, as the items were not measuring the same properties in the circular economy behaviour. The remaining 10 items that focused on processes easy to reproduce in everyday life were included.

2.3.6 Willingness to Pay (WTP) for Circular Products

WTP was assessed using a questionnaire to capture participants' valuation of circular products. The questionnaire consisted of three items, each representing a different circular product category: clothing, electronics, and furniture. The questions were based on Pretner and colleagues' study in 2021.

Participants were presented with hypothetical scenarios in which they were asked to indicate the maximum amount of money they would be willing to pay for each type of circular product. Responses were collected in Euro. The scenarios were stated as follows: "Imagine that you have the possibility to buy two different types of hoodies: a new hoodie made from unused raw (virgin) material, or a new hoodie made from recycled material. The price for the new hoodie made from unused raw material is 50 Euro. How much would you be willing to pay for the new hoodie from recycled material?" Participants had the option to establish a desired price range, spanning from 0 to 100. The subsequent two questions were formulated in the same manner, describing a recycled smartphone and a reclaimed wooden table (see Appendix F for the full questionnaire).

To create a composite measure of WTP across the three product categories with different scale ranges, the responses were standardized for each category to have a mean of 0 and a standard deviation of 1. This standardization was performed to ensure that each product category contributed equally to the overall WTP index. After standardization, the scores for the three categories were averaged to compute the overall WTP index for each participant. The resulting WTP index represented participants' general valuation of circular products, with higher scores indicating a greater willingness to pay for sustainable and circular alternatives. The index had acceptable reliability index ($\alpha = .76$).

2.4 Analysis

Several statistical tests were performed to develop a thorough understanding of the correlations and prediction power of the underlying variables.

1. Correlation Analysis: First, correlation coefficients were calculated to assess the direction and strength of relationships between the predictor variables, such as mindfulness, time perspective, perceived consumer effectiveness, and the two main outcomes, such as circular economy behaviour and willingness to pay. The correlation analysis showed how the variables are related to one another.

2. Regression Analysis to answer H1 and H2: A regression analysis was conducted to analyse the degree to which the predictor factors explained the variance in circular economy behaviour and willingness to pay. In connection to the established correlation the regression analysis aims to evaluate the predictive value of mindfulness, time perspective, and perceived consumer efficacy.

3. Independent Samples t-test to answer H3 and H4: An independent samples t-test was used to examine the effectiveness of the mindfulness intervention. The two groups - mindfulness intervention group and control group - were compared using this statistical technique. Given that the data had a roughly normal distribution, this test was a good choice for examining differences in means between these groups.

4. Mediation Analysis to answer H5 and H6: The PROCESS macro created by Hayes (2017) was used to investigate potential mediation effects. This allowed to determine if the association between mindfulness and circular economy behaviour and willingness to pay is mediated by time perspective and perceived consumer effectiveness. The study sought to identify the underlying processes that could underlie these connections by utilising mediation analysis. The statistical testing was performed with SPSS.

3 Results

3.1 Descriptive Statistic and Intercorrelations

As shown in Table 1, the Langer Mindfulness Scale had a mean of 5.24 and a standard deviation of 0.67. The PCE questions had a mean of 5.57 and a standard deviation of 1.06. The future subscale of short Zimbardo Time Perspective Inventory had a mean of 3.69 and a standard deviation of 0.784. The dependent variable circular economy behaviour had a mean of 5.47 and a standard deviation of 0.85. The willingness to pay questions were standardized with a mean of 0 (willing to pay for circular products the same amount as for new ones) and a standard deviation of 0.83.

Pearson's correlation analysis revealed significant correlations between some of the variables of interest. As expected, mindfulness was positively correlated with circular economy (CE) behaviour ($r=.36, p<0.01$), however not with WTP ($r=.07, p=0.23$). Circular economy behaviour was also positively correlated with PCE ($r=.36, p<0.01$) and future TP ($r=.27, p<0.01$). WTP was not significantly correlated with PCE ($r=.08, p=0.20$) and not with future TP ($r=-.09, p=0.18$). Furthermore, as expected mindfulness was also significantly correlated

with future TP ($r=.25, p<0.01$). Surprisingly, mindfulness and PCE were not significantly correlated.

Table 1: Descriptive statistics and correlations between the variables

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>1. Langer Mindfulness</i>	5.24	.67	1				
<i>2. PCE</i>	5.57	1.06	.13	1			
<i>3. Future TP</i>	3.69	.84	.25**	.23*	1		
<i>4. Circular Economy Behaviour</i>	5.47	.85	.36**	.35**	.23**	1	
<i>5. WTP</i>	.00	.83	.07	.08	-.09	.18*	1

Note: Correlations labelled with ** signify significance at the 0.01 level (one-tailed), while those marked with * indicate significance at the 0.05 level (one-tailed). N= 96

3.2 Regression

To test **H1** that circular economy behaviour (outcome variable) is predicted by mindfulness (predictor variable), a multiple regression analysis was conducted along with PCE and future TP as controlling variables. To enter the predictors, a forced entry method was used. The first block included mindfulness and the second block included PCE and future TP, to be able to compare the predictive value of the model.

The first model summary for mindfulness and circular economy behaviour shows 12% of the variation in circular economy behaviour can be significantly attributed to mindfulness ($\beta=.37, p<.001$).

When PCE and future TP were included into the model, 21% of the variation in circular economy behaviour was explained – a significant improvement over mindfulness alone. Mindfulness was still significantly ($\beta=.32, p=.002$) predicting circular economy behaviour. PCE significantly predicted circular economy behaviour ($\beta =.29, p=.002$). Future TP was not significant ($\beta=.09, p=.33$). If we examine future TP alone, we have a significant prediction

($\beta=.09$, $p=.02$) and 4% explained variance. According to the model, mindfulness and PCE explain most of future TP variance.

To answer **H2** another linear regression analysis was performed to compare the predictive ability of mindfulness, PCE and future orientation variables on WTP. Again the forced entry method was used. Mindfulness ($\beta=.09$, $p=.36$), PCE ($\beta=.10$, $p=.32$) and future TP ($\beta=-.14$, $p=.19$) were non-significant predictors of WTP.

Table 2: Regression analysis

<i>Model</i>	<i>IV</i>	<i>B</i>	β	<i>Std. Error</i>	<i>t</i>	<i>P</i>
1	Langer Mindfulness	.45	.36	.12	3.80	<.001
2	Langer Mindfulness	.37	.30	.11	3.19	.002
	PCE	.23	.29	.07	3.11	.002
	Future TP	.09	.09	.09	.97	.332

Note: Dependent variable: Circular Economy Behaviour. N=96

Table 3: Pearson regression analysis

<i>IV</i>	<i>B</i>	β	<i>Std. Error</i>	<i>t</i>	<i>P</i>
Langer Mindfulness	.11	.09	.13	.90	.36
PCE	.08	.10	.08	.99	.32
Future TP	-.14	-.14	.10	-1.31	.19

Note: Dependent variable: WTP. N=96

3.3 The Effect of Mindfulness Intervention on Dispositional Mindfulness

An independent samples t-test was performed to compare the LMS scores between the control and mindfulness intervention groups. The intervention and control groups were found to not differ significantly from one another; $t[94] = 0.73$, $p>.05$, $d=0.15$. These findings imply

that the levels of dispositional mindfulness in the two groups were not substantially different and can be used for further statistical testing. It was expected that dispositional mindfulness is not significantly affected so quickly by a brief intervention. A state measure of Langerian mindfulness does not exist. Nevertheless, one can observe a higher mindfulness mean in the intervention group compared to control group (Mindfulness: $M=5.30$; $SD=.59$, Control: $M=5.20$; $SD=.73$).

3.4 The Effect of Mindfulness Intervention on Circular Economy Behaviour and WTP

To answer **H3** and **H4** an independent-samples t-test was used. The circular economy behaviour scores and WTP scores between the control and mindfulness intervention groups were compared. Results yielded a statistically significant difference between the experimental manipulation and circular economy behaviour, $t[94]=1.66$, $p=0.049$, $d=0.34$. The mindfulness ($M=5.64$; $SD=.71$) group showed higher levels of circular economy behaviour than the control ($M=5.34$; $SD=.92$). A similar trend was reported when analysing the effect of the experimental group on the WTP, $t[94]=1.401$, $p=0.08$, $d=0.29$. The mindfulness group ($M=.14$; $SD=.80$) showed higher WTP when compared to the control group ($M=-.09$; $SD=.83$)

Table 4: Independent sample t-test

Variable	Group		t	d	p
	M&SD	M&SD			
	Experimental (N=40)	Control (N=56)			
Circular Economy Behaviour	5.64 (.71)	5.34 (.92)	1.665	0.34	.049
WTP	.14 (.80)	-.09 (.83)	1.401	0.29	.08

3.5 Mediation

Mediating variables explain how the outcome and predictor variables are related, revealing underlying processes across behaviours (MacKinnon & Fairchild, 2009). To answer **H5** and **H6**, two independent mediation analyses were conducted. In the first mediation analysis dispositional mindfulness was entered as the independent variable, PCE and future TP were entered as mediators and circular economy behaviour as the dependent variable. The second mediation analysis followed the same structure but with WTP as the dependent variable (Model

4, Hayes, 2017). In other words, the goal was to examine whether the predictor ‘Mindfulness’ has an indirect effect through ‘PCE’ and ‘future TP’ on the outcome ‘circular economy behaviour’ and ‘WTP’.

The results revealed a non-significant indirect effect of dispositional mindfulness on circular economy (PCE: IE=0.0499, 95% CI [-0.0305, 0.1916], $p>.05$; Future TP: IE=0.0296, 95% CI [-0.0570, 0.1125], $p>.05$), rejecting **H5**. Furthermore, the indirect effect of dispositional mindfulness on WTP was also non-significant (PCE: IE=-0.0263, 95% CI [-0.0188, 0.0935]; future TP: IE =0.0438, 95% CI [-0.1294, 0.0189] $p>.05$), rejecting **H6**. Hence, PCE and future TP did not mediate the relationship between dispositional mindfulness and circular economy behaviour or WTP.

4 Discussion

After the announcement of the European Union Circular Economy Action Plan (CEAP), there has been a heightened focus on the concept of circular economy, emphasizing the reutilization and recycling of products, spanning from electronics to clothing. Unfortunately, the reality is that only a minimal portion of products undergoes reuse, recycling, or repurposing. As discussed above, the actions of individuals are primarily influenced by their habits and routines rather than the necessity to weigh long-term consequences against immediate gratification (D’Adamo et al., 2022; Helm & Subramaniam, 2019; Rosenberg, 2004;). Hence, some researchers argue that a transition to circular economy requires a “shift from materialist to post-materialist values, from anthropocentric to ecological worldviews” (Leiserowitz et al., 2005, p. 36). According to the research, mindfulness can achieve this paradigm shift by changing formerly held attitudes, values, and habits (Bahl et al., 2016). Specifically, mindfulness interventions can be used as a tool to achieve the necessary behavioural changes (Tang et al., 2017).

This study addressed the research gap identified in the literature review by, firstly, examining the relationship between dispositional mindfulness and circular economy behaviour as well as towards WTP for circular products. Secondly, by examining the impact of mindfulness intervention on circular economy behaviour as well as on WTP. Thirdly, the study explored if future TP and PCE mediate the relationship between mindfulness and circular economy behaviour as well as WTP. Summarizing the most important findings, we observed a significant effect of dispositional mindfulness on circular economy behaviour, but not WTP.

PCE and future TP also significantly predicted circular economy behaviour but not WTP. In a multiple regression with all predictors, future TP was not significant. The mindfulness intervention group significantly differed from the control group in circular economy behaviour but not WTP, where the intervention group had higher means for circular economy behaviour. The mediation analysis was not significant.

This exploratory study is, to the best of my knowledge, among the scarce empirical inquiries that have examined the impact of Langer's mindfulness intervention on consumers circular economy behaviour and WTP for circular products. This dissertation contributes to the present theoretical debate on the role of mindfulness in promoting circular economy by changing consumption habits. Additionally, it extends previous research (e.g., Amel et al., 2009; Bahl et al., 2016) that used contemplative mindfulness techniques that closely match Eastern Buddhist views as opposed to the socio-cognitive method applied herein. Moreover, previous studies did not investigate the role of PCE and future TP as mediators, a critical aspect that was comprehensively addressed in this study.

In line with the first hypothesis, the study's empirical results confirm that dispositional mindfulness predicts circular economy behaviour. These results are consistent with previous research, which establish a correlational relationship between mindfulness and sustainable consumption behaviour (e.g., Helm & Subramaniam, 2019), pro-environmental behaviour (Barbaro & Pickett, 2016) and ecologically responsible behaviour (Brown & Kasser, 2005). There are three possible ways in which mindfulness affects circular economy: via diminished automaticity and weaker habitual responding (Moore & Malinowski, 2009; Rosenberg, 2009), via diminished attitude-behaviour gap through heightened attention and self-regulation (Amel et al., 2009; Chatzisarantis & Hagger, 2007) and via openness to novelty (Thiermann & Sheate, 2020). Mindful consumers incorporate sustainable values and beliefs into their decision-making process. Consequently, their behaviour aligns more closely with their intentions, as mindful individuals own enhanced control over their thoughts, enabling them to translate these intentions into actions. Hence, more mindful individuals are more likely to participate in circular economy behaviours such as buying second hand products, repairing broken items and reusing or recycling their unwanted possessions. Moreover, individuals with a mindful disposition engage more frequently in seeking out- and generating novelty (Langer, 1992). This inclination could explain why mindful individuals tend to support innovative circular practices, such as sharing or reusing goods and services.

When analysing the effect of the mindfulness intervention, we observe similar results. After a brief-mindfulness intervention, participants were more likely to participate in circular economy behaviour, which confirms the third hypothesis. The observed effectiveness of the brief mindfulness intervention is in line with other studies (Geng et al., 2011; Tang et al., 2017; Wang et al., 2016). This intervention was based on the findings of the experimental study by Geng et al. (2011), in which neutral mindfulness instructions improved an individual's spatial cognition. Wang et al. (2016) extended these findings to connectedness to nature. Their mindfulness condition was also based on Geng et al. (2011) and contained tasks of categorization, multi-perspective thinking and free association. Furthermore, Tang et al. (2017) explored the effect of the mindfulness intervention on pro-environmental behaviour. In their study, the intervention group reported higher levels of intentions for pro-environmental behaviour compared to a randomly assigned control group.

A mindfulness intervention seems to stimulate individuals to self-regulate their attention, consequently engaging 'System 2'. Kahneman (2011) proposed that 'System 2' is activated and prompts attentional mode when individuals encounter information or questions that exceed the capabilities of 'System 1'. The control condition results in what Langer (1997) termed as mindlessness and automatic mode of functioning. The participants in the control condition were more likely to continue in established thought patterns associated with routine behaviours that have adverse effects on our environment. These findings, strengthen the notion of the effectiveness of mindfulness interventions in the realm of environmental protection and circular economy. In the presence of the current environmental concerns, cultivating mindfulness may help individuals transcend restrictive thought patterns and bad habits. Nevertheless, future research needs to be cautious in their choice of the mindful materials used in the mindfulness interventions. Tang et al. (2017) discovered that the type and nature of the learning material influence the behaviour under investigation. The study's intervention yielded adverse outcomes in the realm of environmental protection when the materials had a self-related focus. Additionally, despite this study being able to achieve significant results, the small sample size should be taken into consideration when interpreting the findings. Further, more large-scale research is necessary to fully comprehend the connections between Langerian mindfulness and circular economy behaviour.

Regarding the second and forth hypothesis, dispositional mindfulness did not significantly predict WTP for circular products and there did not exist a significant difference

between the intervention and control group. It is worth noting here, that divergent opinions exist in the academic literature. On the one hand, Dhandra (2019) and Daniel et al. (2023) affirmed that mindful individuals were more willing to purchase environmental-friendly products. On the other hand, Pretner et al. (2021) caution that although previous studies indicate that consumers are willing to pay more for products with eco-friendly features, this connection might not extend to circular economy products. Their study showed that WTP for circular products, including recycled and reused items, is less than that for their conventional counterparts. These confirm older studies which indicate that consumers pay comparatively less for goods that have been recycled, refurbished, or reused (Guide & Li, 2010; Michaud & Llerena, 2011). One potential explanation might be that circular economy products are often perceived as having lower quality (Pretner et al., 2021). In an experimental setting, Geiger et al. (2019) also observed no significant increase in purchase behaviour of organic and fairly produced products and other consumption behaviour after mindfulness training. Despite the non-significant results of this study, one can observe a positive trend with a small effect size ($d=0.29$). More conclusive results may be obtained by increasing the sample size.

Finally, this study could not find any significant mediation between dispositional mindfulness and circular economy behaviour and WTP, rejecting the hypotheses five and six. This contradicts the results of Helm and Subramaniam (2019), in which PCE mediated the relationship between mindfulness and sustainable consumption behaviour. Correlational analysis revealed that although mediation was not existent, as expected PCE and future TP were positively related to dispositional mindfulness and circular economy behaviour. One possible explanation that the mediation effect was not found, is because it was indirect. The research by Pereira et al. (2022) showed that mindfulness has an indirect relationship with PCE, where water-utilitarian beliefs were mediating the relationship. Similarly, Polonsky et al. (2014) find that environmental orientation mediated the relationship between future orientation and pro-environmental consumer behaviour. In other words, having a future-oriented perspective leads to a heightened environmental concern, which subsequently predicts an individual's engagement in sustainable consumption. Heo and Muralidharan (2019) also noticed that PCE was not directly related to environmentally conscious consumer behaviour, but indirectly through environmental concern. These findings imply the need for additional research into alternative mediating factors and a deeper investigation to determine the extent to which this

relationship is fully or partially mediated. Another explanation of the non-significant finding is that the sample size was too small to achieve statistical significance.

4.1 Implications

Alongside its theoretical contribution, this study also has important practical implications. The results suggest that interventions designed to promote mindfulness could play a vital role in circular economy behaviour on two different levels: individual and societal.

The transformative potential of mindfulness is found in consumers actively involving themselves in various phases of consumption with heightened consciousness and understanding (Bahl et al., 2016). This study revealed that even short mindfulness exercises can effectively influence circular economy behaviour. Engaging in brief mindfulness exercises could allow consumers to apply mindfulness to their own consumption habits and integrate it into their daily lives, fostering a more sustainable approach. One simple application to integrate mindfulness into consumption practices, especially for busy consumers, are the variety of available online programs and apps designed for this purpose. A plethora of platforms such as Simple Habit and Headspace provide structured methods for individuals to cultivate mindfulness skills across various aspects of life. For example, the app Insight Timer offers resources for mindfulness practitioners, offering features like meditation-timers, journaling, and a supportive likeminded community (Bahl et al., 2016). In addition, organizations like the UK based Mental Health Foundation offer online podcasts which instruct the listener on how to do mindful breathing. In this context, future research endeavours could delve into the efficacy of mobile app usage and determine whether these apps and other nudges genuinely promote mindfulness (Helm & Subramaniam, 2019).

The incorporation of mindfulness as a technique could also be considered within the realm of circular economy governance and should be a topic of discussion in policy. For example, the British All-Party Parliamentary Group on Mindfulness (MAPPG) has made significant strides in formulating policy initiatives grounded in the science of mindfulness. In 2014, The MAPPG initiated a year-long inquiry aimed at examining the present application and future prospects of mindfulness in the public sphere. This comprehensive investigation comprised eight hearings that centred on various policy domains, encompassing healthcare, education, criminal justice, and the workplace (Bristow, 2019).

The United Nations Member States' 2030 Agenda for Sustainable Development acts as a cooperative road map for promoting sustainable development. An important objective of this framework is to educate the public and encourage them to adopt sustainable consumption patterns and lifestyles. For example, the incorporation of mindfulness training into curricula by regional school boards and European ministries of education has the potential to develop educational initiatives that link mindfulness with economic, and social decisions, including various consumption-related aspects. In this context, children and adolescents could acquire and sustain skills that are less influenced by current societal norms and culture, and instead, are guided by an awareness of choices and behaviours that advance sustainable outcomes. Davidson and McEwen (2012) argue that mindful training "might constitute ideal interventions to promote early self-control and improve later adult prosocial outcomes" (p. 694).

Drawing on Langer's (1997) insights in 'The Power of Mindful Learning', this study proposes that innovative educational interventions should consider not only how students acquire knowledge but also how teachers present it. Langer's argument underscores the need for a holistic approach to learning that considers the methods of instruction as well as the receptiveness of learners (Helm & Subramaniam, 2019). A contemporary example is the New School San Francisco, an innovative US charter school, which applied mindful teaching into their learning approaches (Davenport & Pagnini, 2016). When mindful strategies are integrated into education, students are provided with substantial opportunities to develop crucial 21st-century skills such as creativity, collaboration, communication, and critical thinking. Additionally, the adoption of Langerian mindfulness has been shown to be a valuable tool for enhancing 'Social-Emotional Learning' within inclusive classroom settings (Davenport & Pagnini, 2016). The enthusiastic attitude of students underscores the potential for integrating mindfulness practices into the curriculum, as revealed by Wamsler et al. (2017). Participants in their survey consistently indicated positive outcomes from mindfulness training, with an overwhelming 80% expressing their desire to incorporate mindfulness into regular classes (Wamsler et al., 2017).

Likewise, mindfulness and mindfulness training are relevant to the business sector, both on the employee level as well as the company strategy level. Regarding the former, Siqueira and Pitassi (2016) argue that the development of cognitive skills, attitudes, and behaviour of employees may all be positively influenced by mindfulness. Consequently, employees can improve their ability to recognise and use innovative ideas by practising mindfulness, which,

in turn, may lead to circular-oriented innovations. Regarding the latter, the clothing manufacturer Patagonia provides a prime example of a successful business that has incorporated mindful consumption into its strategy, by advising customers to think carefully before making purchases and by providing choices for repair, reuse, and recycling for its goods (Gelles, 2015). Another relevant example comes from research in the tourism sector. Pongsakornrunsilp and Pongsakornrunsilp (2021) reveal how mindful consumption can be applied to promote circular economy in the tourism sector in Krabi, Thailand. These real-life examples collectively underscore the far-reaching impact of mindfulness, transcending boundaries and contributing to sustainable and circular-oriented practices across various domains.

In conclusion, the shift in perception of circular economy and the consumer's willingness to participate within it can serve as a foundation for governments and businesses to design mindfulness interventions and communication strategies capable of significantly influencing consumer acceptance and adoption of sustainable circular economy practices.

4.2 Limitations and Future Research

There are further limitations to this study which present opportunities for future research. First, the conclusions of this study are limited in their representativeness by the sampling method. The convenience sampling method does not employ chance selection criteria. As a result, nonprobability samples need to be used with caution. This makes it difficult to extrapolate the results to the whole population.

Secondly, the intervention group encountered a higher rate of participant dropouts, resulting in a smaller group size compared to the control group. This phenomenon could potentially be attributed to the open-ended nature of the used mindfulness intervention exercises. One notable drawback of using narrative open-ended questions is that they typically result in more missing data and less comprehensive responses compared to closed-ended questions, which is often attributed to the increased effort required to answer them. Respondents also need the ability and motivation to articulate their thoughts in their own words, which can be challenging (Reja et al., 2003). Moreover, the absence of the researcher during the electronic survey may have prevented respondents who encountered difficulties with the questionnaire from seeking clarification. Future research should consider repeating this experiment in a laboratorial setting to avoid dropouts and incomplete data.

Thirdly, while efforts were made to incorporate multiple measures, e.g., WTP, the study largely relied on participants' self-reported circular economy behaviours. To enhance the robustness of future research, it is recommended to expand investigations to include actual behaviours and a more diverse range of behavioural measures that can be influenced by mindfulness interventions. Exploring the true effect of mindfulness interventions on behaviour may necessitate a multidimensional approach, including mixed-method field studies, garbage (the analysis of waste), panel data analysis, additional extended field experiments and longitudinal observations of in-home behaviour. In addition, the relationship between mindfulness and WTP for circular products demands further investigation. Since the WTP measure scenario within the survey was purely hypothetical, it would be beneficial to observe the results of real-world market conditions where participants spend actual money (e.g., Akaichi et al., 2017).

Finally, in this study only one mindfulness (creative engagement of categorization) session was held. Future research should expand on this and examine additional facets of mindfulness in order to compare the outcomes of each intervention. Even though a brief 10 to 15-minute mindfulness intervention appeared to be sufficient to influence more pronounced circular economy behaviour, longer interventions may have a greater impact, especially on behaviours that require the disruption of automatic patterns (Böhme et al., 2018). Given the inconclusive results on sustainable consumption behaviours observed in longitudinal studies, there is a growing recognition of the necessity for extended evaluation periods to effectively gauge the outcomes of interventions (Geiger et al., 2019).

Future research may also try to replicate the experiment with other mediators or moderators. One possible mediator could be self-identity. Daniel et al. (2023) revealed that an individual's self-ethical identity may indeed serve as a mediating factor in the relationship between their dispositional mindfulness and their green purchase intentions and that mindfulness training has the potential to enhance this mediating effect. Moreover, considering that products can hold varying significance for different individuals, it is evident that the role of products in shaping consumer identities holds significant importance (Catulli et al., 2016). Within circular economy, consumption takes on an anonymous nature as individuals no longer possess products but simply utilize them. The ability for goods to define one's identity diminishes, potentially leading to a shift away from self-definition through material possessions.

Another possible mediator is uncertainty. In the context of circular economy, where products move through the consumption phases and subsequently can continue their journey with other consumers, concerns related to trust, risk, and control become increasingly relevant. For example, trust in service providers plays a pivotal role in shaping attitudes toward leasing or renting (Catulli et al., 2013). It is crucial to note that the variable may be interconnected. For instance, an individual's personal values, such as self-identity, can influence how they perceive risk, and this relationship might be influenced by various psychological factors (Camacho-Otero et al., 2018). Therefore, it is worth investigating how these variables influence the relationship between circular economy and mindfulness.

Circular economy behaviours, such as sharing or renting goods, are intricately tied to social constructs. These practices highlight the cooperative nature of human interactions, spanning from significant contributions that address climate change to everyday actions, like lending one's possession. This cooperative behaviour reflects a form of social mindfulness. A study conducted by Kirkland et al. (2022) not only confirmed the strong link between social mindfulness and environmental performance but also expanded this connection to encompass a broad spectrum of intricate cooperative measures. Future research should delve deeper into understanding the precise relationship between social mindfulness and the circular economy.

Conclusion

As circular economy garners increasing attention and recognition as a potential solution to acute environmental challenges, the need to comprehend and shape consumer behaviours has emerged as both a pivotal challenge and a significant opportunity. Hence, this dissertation aimed to investigate the effectiveness of dispositional mindfulness and mindfulness intervention in promoting circular economy behaviour and to explore the mediating role of perceived consumer effectiveness (PCE) and future time perspective (TP).

In summary, the study's primary results emphasize the substantial impact of dispositional mindfulness on circular economy behaviour, while its influence on willingness to pay (WTP) appears less pronounced. Notably, the group exposed to the mindfulness intervention demonstrated significantly heightened levels of circular economy behaviour compared to the control group, though no such contrast emerged concerning WTP. Importantly, although PCE and future TP were correlated with both dispositional mindfulness and circular economy behaviour, their mediation did not yield statistically significant results.

The findings of this dissertation have significant academic and practical implications. Firstly, the research has provided empirical evidence supporting the positive impact of mindfulness brief interventions on circular economy behaviour. This contributes to the growing body of knowledge on how mindfulness practices can be leveraged to encourage sustainable consumption. Secondly, these findings can be implemented by businesses and policymakers to create interventions and educational programmes that increase awareness, enable people to make informed consumption decisions, and close the gap between attitudes and behaviours in the context of sustainable consumption and the circular economy.

Incorporating mindfulness into our daily life's can change our thinking patterns, resulting in a deeper comprehension of how personal decisions affect the environment and social well-being, ultimately contributing to a more circular economy - as Buddha once stated, "Our life is shaped by our mind, for we what we become what we think".

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Appendices

Appendix A: Consent Form

Dear Participant,

Thank you for agreeing to participate in this study. The following section details the purpose of this study, a description of the involvement required and your rights as a participant.

The purpose of this study is to understand consumer participation in circular economy (CE). The concept of CE involves the principles of waste and pollution reduction, extending the lifespan of products and materials, and restoring natural systems.

You will be asked to answer truthfully few questionnaires and participate in a small exercise. The total duration of this experiment will be approximately 20 minutes.

Kindly be informed that your answers will be treated confidentially and in accordance with the General Data Protection Regulation (GDPR) guidelines of the European Union. The individual responses are only restricted to the research team and will not be published. Furthermore, all data will be used only for scientific research and will not be personalized.

Your involvement in this research project is fully voluntary and you are not obliged to take part. If you choose to participate, you have the freedom to withdraw your participation at any point. To discontinue your involvement, you may simply close your browser, which will end your participation in the study. It is important to note that your decision will not result in any negative consequences or harm. Additionally, you have the option to request the removal or deletion of your personal information from the research records.

If you have further questions, please do not hesitate to contact me:

email: s-jevseev@ucp.pt

By choosing yes below I acknowledge that I have read and understand the above information. I am aware that I can discontinue my participation in the study at any time.

We thank you very much for taking the time to complete this survey!

Appendix B: Langer Mindfulness Scale 14 (LMS)

Instructions: Below are a number of statements that refer to your personal outlook. Please rate the extent to which you agree with each of these statements. If you are confused by the wording of an item, have no opinion, or neither agree nor disagree, use the "4" or "NEUTRAL" rating. Thank you for your assistance.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

- 1) I like to investigate things. (NS)
- 2) I generate few novel ideas. (NP)
- 3) I make many novel contributions. (NP)
- 4) I seldom notice what other people are up to. (E)
- 5) I avoid thought provoking conversations. (E)
- 6) I am very creative. (NP)
- 7) I am very curious. (NS)
- 8) I try to think of new ways of doing things. (NS)
- 9) I am rarely aware of changes. (E)
- 10) I like to be challenged intellectually. (NS)
- 11) I find it easy to create new and effective ideas. (NP)
- 12) I am rarely alert to new developments. (E)
- 13) I like to figure out how things work. (NS)
- 14) I am not an original thinker. (NP)

Appendix C: Perceived Consumer Effectiveness Scale (PCE)

1. It is worth, as individual consumer, to make efforts to preserve our environment and improve the circular economy.
2. Since each individual has an effect upon circular economy, what I do can make meaningful difference.
3. By purchasing circular products or service, each consumer's behaviour can have a positive effect on the environment and society.
4. It is worthless as the circular economy should be controlled by the federal government and companies.
5. There is not much that one individual can do about the circular economy.

Appendix D: Short Zimbardo Time Perspective Inventory

Read each item and, as honestly as you can, answer the question: 'How characteristic or true is this of me?' Check the appropriate answer according to the scale below.

- 1 Very Untrue
- 2 Untrue
- 3 Neutral
- 4 True
- 5 Very True

Please answer all the following questions:

1. I think about the bad things that have happened to me in the past
2. Painful past experiences keep being replayed in my mind
3. It's hard for me to forget unpleasant images of my youth
4. Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories
5. Happy memories of good times spring readily to mind
6. I enjoy stories about how things used to be in the 'good old times'
7. Life today is too complicated; I would prefer the simpler life of the past
8. Since whatever will be will be, it doesn't really matter what I do
9. Often luck pays off better than hard work
10. I make decisions on the spur of the moment
11. Taking risks keeps my life from becoming boring
12. It is important to put excitement in my life
13. When I want to achieve something, I set goals and consider specific means for reaching those goals
14. Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play
15. I complete projects on time by making steady progress

Past negative: 1, 2, 3; Past positive: 4, 5, 6; Present fatalism: 7, 8, 9; Present hedonism: 10, 11, 12; Future: 13, 14, 15.

Appendix E: Circular Economy Behaviour

Purchasing

1. How likely are you to purchase second hand products instead of new ones in the near future?
2. How likely are you to buy the latest fashion for clothes in the near future? R
3. How likely are you to purchase refurbished electronic goods and gadgets in the near future?
4. How likely are you to purchase products containing reused or recycled materials in the near future?
5. How likely are you to participate in a sharing economy (e.g. renting or lending goods instead of purchasing new ones)?

Using

6. How likely are you to repair a possession rather than replace it if they break in the near future?
7. How likely are you to keep things you own for a longer time period in the near future?
8. How likely are you to follow care instructions for possessions, such as washing or drying instructions on clothing labels?
9. How likely are you to repurpose a possession when they are no longer needed in the near future?
10. How likely are you to reuse packaging materials or containers for a different purpose instead of throwing them away?

Proper discarding

11. How likely are you to recycle your unwanted possession in the near future?
12. How likely are you to follow local regulations and guidelines for proper disposal of waste and recyclables?
13. How likely are you to resell your unwanted possessions in the near future
14. How likely are you to reduce waste by opting for digital copies of documents or receipts instead of printing them out?

Appendix F: Willingness To Pay

1. Imagine that you have the possibility to buy two different types of hoodies: a new hoodie made from **unused raw (virgin) material** or a new hoodie made from **recycled material**.

The price for the new hoodie made from **unused raw** material is **50 Euro**.

How much would you be willing to pay for the new hoodie from **recycled material**?



2. Imagine that you have the possibility to buy two different types of smartphones of the same brand and model: a new smartphone made from **unused raw material** or a new smartphone made from **recycled material**.

The price for the new smartphone made from unused raw material is **500 Euro**.

How much would you be willing to pay for the new smartphone from **recycled material**?



3. Imagine that you have the possibility to buy two identical looking types of tables: a new table made from **unused raw wood** or a new table made from **reclaimed wood**.

The price for the new table made from **unused raw** wood is **500 Euro**.

How much would you be willing to pay for the new table from **reclaimed wood**?

