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Can the Circular Economy Concretize Sustainability? A Construal Level Approach to Encourage Sustainable Consumption.

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CAN THE CIRCULAR ECONOMY CONCRETIZE SUSTAINABILITY?

A CONSTRUAL LEVEL APPROACH TO ENCOURAGE SUSTAINABLE CONSUMPTION.

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of the requirements for the degree of

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DEDICATION

This dissertation is dedicated to my amazing children, Justin and Sedona, who provide me with

immense joy. My hope is that learnings generated from this research contribute to your bright,

bold, and sustainable futures.

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I am grateful to several individuals who provided me with inspiration, guidance, and encouragement throughout my doctoral journey. I thank my family, who has been incredibly supportive and patient. I also acknowledge my friends, faculty members of the Pepperdine Graziadio doctoral program, as well as members of my cohort, some of whom were instrumental in helping me to persevere while reminding me to laugh along the way. And, importantly, a heartfelt thank you to my dissertation advisors: my external advisor, Dr. Remi Trudel, whose research in sustainability and prosocial marketing inspired me and was a starting point for my own research; the very talented Dr. Cristina Gibson, who taught me many things, one being the art of having your research tell a story; and finally my supervisor, Dr. Cristel Russell, who has been an amazing mentor, teacher, and friend, having gone way beyond the call of duty. This research is most certainly the culmination of both of our efforts.

VITA

Dr. Jolie Gutentag was born and raised in Los Angeles, California and has spent most of her professional career working in Europe, where she held leading management positions at notable companies such as Procter & Gamble and Nestlé. Her expertise lies in the areas of consumer marketing, product innovation, and general management. In 2013, she took over and ran her family's semiconductor packaging business which she sold to Advantek, a leader in the industry. Jolie currently works as a consultant, interim C level executive, and trainer for renowned organizations. She also is an adjunct professor at Pepperdine Graziadio Business School for Socially, Environmentally, and Ethically Responsible Business Strategy, Marketing, Marketing Analytics, and Cross-Cultural Management. The combination of her extensive real world business experience and strong educator background and capabilities allows Jolie to be highly effective with both teams and individuals. Jolie holds a BA from Tufts University, an MBA from Thunderbird School of Global Management, and a Doctorate of Business Administration from Pepperdine Graziadio Business School.

ABSTRACT

Despite a growing awareness and understanding of the impact our lifestyles have on the environment, most people have not adequately changed their consumption patterns. One possibility for the disconnect is the perceived abstractness of sustainability. Drawing on construal level theory, this research proposes that framing environmental sustainability as circularity, using the principles of the circular economy, reduces the perceived abstractness of sustainability. Four studies investigate the effects of circular framing on sustainable consumption behavior, including the moderating role of consumers' chronic level of construal, an innate mindset reflecting a tendency to view information more concretely or abstractly. Findings provide initial evidence that, beyond offering a viable economic solution to operationalize sustainable development, the concept of circularity can concretize the abstract construct of sustainability, shifting the paradigm of sustainable behavior and consumers' willingness to engage. This knowledge has important implications for both companies and policymakers in developing strategies and messaging to step-change consumer acceptance and adoption of sustainable behaviors. Limitations and future research directions are discussed.

Keywords: circular economy, construal level theory, sustainability, sustainable behavior, framing

CHAPTER 1: INTRODUCTION

Overview

Despite a growing awareness and understanding of the impact our lifestyles have on the environment, most people have not adequately changed their consumption patterns. One possibility for the disconnect is the perceived abstractness of sustainability. Drawing on construal level theory, this research proposes that framing sustainability as circularity, using the principles of the circular economy, reduces the perceived abstractness of sustainability. I theorize that the concept of circularity is more concrete than sustainability, and that this heightened concreteness leads to a more explicit interpretation, which in turn prompts consumers to behave more sustainably.

Four studies investigate the effects of circular framing on sustainable consumption behavior, including the moderating role of consumers' chronic level of construal, an innate mindset reflecting a tendency to view information more concretely or abstractly. Study 1 examines the relationship between construal of sustainability, consumers' chronic construal mindset, and engagement in sustainable behaviors. Study 2 and Study 3 investigate whether a message or intervention that frames sustainability as circularity impacts sustainable behavior. Finally, Study 4 assesses commonly used sustainable marketing claims to validate whether circular framed marketing messages are more concrete than sustainably framed marketing messages and if the effect is stronger for more concrete individuals. Learnings from this research will have implications for the positioning and communication of sustainability in both society and business and will make a theoretical contribution regarding the role of construal level theory in motivating sustainable consumption behavior.

Problem Addressed

A core challenge in advancing sustainable consumption adoption is the discrepancy between society's environmental concerns and actual behaviors (Ehrich & Irwin, 2005;

Peattie, 2010; Trudel, 2019; White et al., 2019). The issue of environmental degradation is becoming less distal; heightening awareness and public conversation surrounding the environment are molded by pervasive media presence and indelible images depicting the human cost of increasingly frequent and devastating natural disasters. In the two decades preceding 2017, the number of natural disasters related to climate change, which accounted for 91% of total natural disasters, more than doubled from 3,300 to 6,580 when compared to the previous two decades. Associated economic losses rose by 151%, from $895 billion to $2,245 billion (CRED & UNISDR, 2018). Vast areas of land have been ravaged by wildfires, earthquakes, tropical storms, and other forms of extreme weather. It is expected that the damage and impact of these events will continue to grow over time. If there is a silver lining to be found, it is that people are becoming increasingly aware that our livelihoods are dependent on nature and of the damage our current lifestyles wreak on the planet we inhabit.

The environment has risen to the top of political agendas, as evidenced by its prominence at the World Economic Forum and the establishment of global treaties such as the Paris Climate Agreement and European Green Deal. Companies strive to integrate corporate sustainability into their business models, not only to meet consumer demands, but also to compete on the labor market. Millions of children across the globe have walked out of their classrooms, joining demonstrations that appeal to governments and businesses to take action. According to a report on Climate Change in the American Mind, two thirds of Americans are worried about global warming and 59% believe that it is caused by humans (Leiserowitz et al., 2019).

Despite this growing awareness and public conviction, people have not changed their behavior enough to make an impact. A US Environmental Footprint report from the Center for Sustainable Systems at the University of Michigan (2019) provides a comprehensive summary of the key sustainability measurements and indicators. Generation of municipal

solid waste (MSW) in the U.S. has grown from 2.68 pounds per person per day in 1960 to 4.5 pounds in 2017. Meanwhile, only 35% was recycled or composted, with the rest being diverted to landfills and incinerators. Approximately 22% of food goes to landfill, which accounts for 15% of MSW (EPA, 2019). The U.S. consumes 17% of the world's energy yet represents less than 5% of the global population (US EIA, 2019). CO_2 emissions are 16.5 metric tons per capita, the highest in the world (World Bank, 2017). Transportation generates 29% of greenhouse gas emissions (EPA, 2019); nevertheless, the U.S. has 272.5 million registered cars, 47.1 million more than licensed drivers (US Department of Transportation, 2018) and 76% of people drive alone to work (US DOE, 2018). The opportunity for improvement is staggering.

Construal of Sustainability: A Promising Approach

The discrepancy between people's environmental beliefs and their inability or unwillingness to change their consumption behavior has been addressed in the sustainable consumption literature. Although several important intrinsic and extrinsic factors have been identified, most studies have examined these factors within the realms of a specific sustainable activity and not as a lever to encourage an overall shift to sustainable consumption behaviors (Peattie, 2010). One promising approach for developing a deeper understanding of sustainable consumption is investigating the way in which sustainability is interpreted, or construed. In accordance with the principles of construal level theory (Trope & Liberman, 2003), some scholars posit that the concept of sustainability may be perceived as too abstract and that this perceived abstractness makes it difficult for consumers to change their behaviors (Reczek et al., 2018; White et al., 2019). Suggestions to concretize sustainability have been made, yet few studies have investigated specific means to do so. Finding an overarching mechanism that makes sustainability less abstract and impacts a broad range of sustainable consumption activities is vital to step-changing widespread

adoption of sustainable behaviors. Accordingly, scholars have begun to call for studies that identify specific measures to communicate sustainability in more concrete ways (Trudel, 2019).

To address this pressing issue, I propose that framing sustainability as it pertains to the environment as circularity would provide consumers with a more concrete interpretation of sustainability by making it more tangible, prompting consumers to act. Circularity maintains that, like nature, we maximize the value of existing resources and reuse all waste as inputs, with the goal of producing zero waste (Ellen MacArthur, 2012; Kirchherr et al., 2017). Circularity offers a new environmental sustainability paradigm that has the potential to concretize consumers' understanding of sustainability and ultimately shift consumption patterns. Addressing the problem of unsustainable consumption has the power to bring about benefits with regards to human and financial costs associated with environmental degradation, climate change, and social inequality. Additionally, it can facilitate economic expansion, in the face of exponential growth in the demand for finite raw materials.

Research Question(s)

In examining this issue, I investigated five research questions:

1. To what extent do consumers currently perceive the concept of sustainability as abstract?
2. To what degree is consumers' perceived level of abstractness of sustainability related to their engagement in sustainable behaviors?
3. Can a message or intervention which frames sustainability as circularity make it more concrete (i.e., concretize it) and increase engagement in sustainable behaviors?
4. Do individual differences in chronic levels of construal (tendency to view information more abstractly or concretely) influence (a) engagement in sustainable behaviors, (b) the relationship between how concretely sustainability is perceived and engagement in

sustainable behaviors, and/or (c) the effectiveness of a message or intervention to frame sustainability as circularity?

5. To what extent do consumers perceive commonly used sustainable marketing claims in household care products as circular?

Objective and Aims of the Research

Drawing on construal level theory (Trope & Liberman, 2003), this research examined whether increasing the concreteness of sustainability by framing it as circularity motivates consumers to behave more sustainably. The research encompassed four studies. The first study investigated the relationship between consumers' construal of sustainability, their individual chronic level of construal, and their engagement in sustainable behaviors. The study also assessed consumers' current awareness and knowledge of the circular economy. Two subsequent studies utilized experimental designs to evaluate whether an external intervention (using messaging or an educational video which frames sustainability as circularity) increases concreteness of sustainability and whether this, in turn, increases engagement in sustainable behaviors. The experiments also investigated how varying levels of individual chronic level of construal moderate the relationship and affect the size of the effect of the message/intervention. A final study validated the effect of circular messaging for sustainable marketing claims from commonly used household products on how concretely the sustainable message is construed and if the effect is stronger for people with more concrete chronic construal. The model in Figure 1 visualizes the constructs and the proposed relationships between them.

Figure 1

Proposed Model
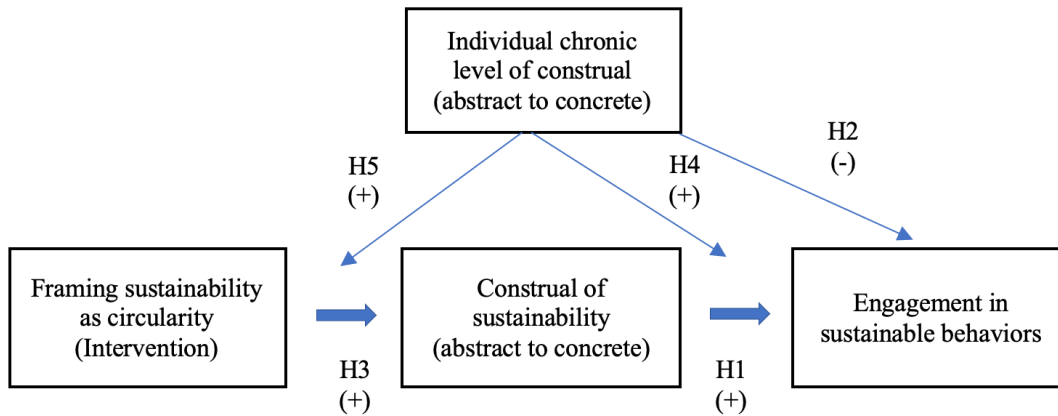
How Aims were Accomplished

To obtain quantitative descriptions of attitudes and behaviors as well as test for associations and causal relationships across demographics, two cross-sectional surveys and two randomized controlled experiments were conducted. Based on the limitations of the COVID-19 pandemic, all studies were conducted online. The research design was built on a postpositivist worldview, which embraces a deterministic philosophy that outcomes are most likely determined by effects (Phillips & Burbules, 2000). A quantitative research approach was selected to search for the laws of causation that influence outcomes, based on the philosophical methodological view of reductionism, which posits that phenomena can be explained in terms of smaller, discrete entities (Creswell & Creswell, 2018). Quantitative research is appropriate for this task as it investigates constructs and theory which are well defined (Edmondson & McManus, 2007). The philosophical postpositivist assumption of this research originates from Karl Popper and embraces the idea that knowledge and reality are discovered based on observation and measurement and not merely constructed or created by the individual. It suggests that the meaning of phenomena can be observed and measured in a mostly, but not completely, objective manner (Creswell & Creswell, 2018). Post-positivism differs from positivist philosophical assumptions of Hume and Comte in recognizing that

there are no absolute truths of knowledge and that causation can only be determined as probable, not given. Positivism stems in part from the concept of Eklaren, which puts forward that knowledge in social sciences is derived from explaining what happens based on cause and effect of an observed phenomena, much like in natural sciences. It refutes the constructivist philosophical worldview of Verstehen stemming from Max Weber, which argues that knowledge only comes from understanding the numerous and unique interpretations of the individual (Schwandt, 1998).

Study 1 utilized a cross sectional survey amongst a national sample of adults to obtain statistical relationships between how concretely sustainability is perceived and how this perceived level of concreteness is related to sustainable consumption behavior (Fowler, 2009). Based on the principles of experimentation originating from Fisher (1925), two subsequent studies employed randomized controlled experiments. An intervention was deliberately introduced to observe its causal inference (Shadish et al., 2015) and participants were randomly assigned to receive one of the interventions and/or control treatment. This research design provided the following data: descriptive data regarding the distribution of characteristics, attitudes, and behaviors amongst the selected population; the relationship between constructs; and an estimate of the size of the treatment effect. Such insights can be used by companies and policymakers to develop strategies that step-change consumer acceptance and adoption of sustainable consumption to help to facilitate more rapid diffusion.

Significance of the Proposed Research

Past research has identified several explanations why consumers have not yet adequately engaged in sustainable consumption behaviors, despite having a high level of concern for the environment. Factors related to inaction include social norms (Abrahamse & Steg, 2013; White & Simpson, 2013), personal values and beliefs (Lindenberg & Steg, 2007; Stern, 2000; Weber, 2015), feelings of personal responsibility (Wells et al., 2011), habits

(Donald et al., 2014; Verplanken & Roy, 2016), financial incentives (Bowles, 2008) and contextual considerations (Stern, 2000). Most research has been conducted within the boundaries of a specific sustainable behavior, such as recycling or energy conservation, and has not addressed measures that influence an overall shift to more engagement in sustainable consumption patterns (Peattie, 2010). One possibility for the disconnect between consumers' environmental attitudes and their unsustainable behaviors can be attributed to the perceived abstractness of sustainability which, in turn, negatively impacts willingness to engage. Some studies suggest that sustainability is perceived as abstract as it is inconsistent and ill-defined (Peattie, 2010), lacks a clear conceptual foundation (Purvis et al., 2019), has a diverse set of principles and measurements (Catlin et al., 2017), and is impalpable (Griskevicius et al., 2012). Other research examines how perceived abstractness of sustainability and other concepts associated with sustainability such as climate change, are linked to psychological distance (Arnocky et al., 2014; Leiserowitz et al., 2019, Spence et al., 2012; Weber, 2010) as well as an individual's innate tendency to view information more abstractly or concretely, that is, individual chronic level of construal (Reczek et al., 2018; White et al., 2011).

Academic researchers have begun to explore how reducing the perceived abstractness of sustainability can lead to more engagement in specific sustainable behaviors (Trudel, 2019; White et al., 2019) and have provided various suggestions on how to achieve this. This includes messages showing product transformation (Winterich et al., 2019), focusing on local issues and impact (Li et al., 2011), making effects visible (Weber, 2015), communicating concrete experiences (Marx et al., 2007), and emphasizing future generations (Trudel, 2019). In the current research, I investigate a novel way to concretize sustainability and motivate consumers to generally engage in sustainable behaviors. I suggest that framing sustainability as circularity, the conceptual basis of the circular economy, offers consumers a more concrete explanation of sustainability which can motivate consumers to act. Specifically, I draw on

construal level theory (CLT: Trope & Liberman, 2003) and the circular economy literature to propose that framing sustainable marketing messaging as circularity makes sustainability more concrete for consumers, eliciting higher purchase intentions and more engagement in sustainable behaviors. Moreover, framing sustainability as circularity using an educational video motivates consumers to engage in sustainable behaviors. I further theorize that interventions that frame sustainability as circular have a stronger effect on those who habitually construe information more concretely. Past research suggests that individuals who are more concrete tend not to engage in sustainable behaviors (Reczek et al., 2018).

This research builds on past CLT research that has shown that sustainable behaviors can be influenced by matching construct construal messaging with individual chronic construal (Chang et al., 2015; Goldsmith et al., 2019; Macdonell & White, 2015; Reczek et al., 2018; Zaval et al., 2015). I accomplish this by investigating circularity as the solution to make the concept of sustainability more concrete, matching the individual chronic level of construal of more concrete individuals (i.e., those who tend not to engage in sustainable behaviors). To the best of my knowledge, past research has not investigated sustainability at the crossroads of CLT and circularity or the interplay between consumer construal, sustainability, and circularity. Instead, past research has examined other factors that influence construal of sustainability and how those factors affect associated attitudes and behaviors. For example, the purchase of sustainable products can be prompted by framing current benefits for concrete individuals or future benefits for abstract individuals (Reczek et al., 2018). Similarly, Goldsmith et al. (2016) found it best to communicate economic benefits for concrete individuals and environmental benefits for abstract individuals. Reczek et al. (2018) found it best to provide detailed information about sustainable attributes for concrete individuals (Reczek et al. 2018). Other research found that matching 'loss-framing' messaging for concrete individuals and 'gain-framing' messaging for abstract individuals

leads to higher levels of recycling and purchase intentions of sustainable products (Chang et al., 2015; White et al., 2011). Macdonnell and White (2015) demonstrate that messaging which activates a concrete mindset leads to higher donations of money (concrete concept), whereas messaging that activates an abstract mindset leads to higher donations of time (abstract concept). Finally, Goldsmith et al. (2019) suggest that messaging linked to resource scarcity activates an abstract level of construal, leading consumers to choose a sustainable product when prosocial benefits (abstract messaging) are emphasized. My research extends this extant work in that I look at circularity as a solution to making sustainability more concrete and hence motivate more concrete consumers to engage in sustainable behaviors. It is expected that the learnings from this dissertation will make a contribution to the limited body of knowledge on specific measures to concretize the concept of sustainability and provide suggestive actions to enable more widespread adoption of sustainable consumption. This knowledge may assist companies and policymakers develop strategies that can step-change consumer acceptance and adoption of sustainable behaviors.

CHAPTER 2: LITERATURE REVIEW

Sustainability and Sustainable Consumption

Sustainability as an Abstract Construct

Scholars have begun to suggest that the construct of sustainability is perceived as too abstract. Sustainability has been described in the literature as inconsistent and ill-defined (Peattie, 2010), with multiple interpretations (Simpson & Radford, 2012), ambiguous (Crittenden et al., 2011), vague and abstract (White et al., 2019), and impalpable (Griskevicius et al., 2012). Moreover, a lack of a clear conceptual foundation has fueled the development of a myriad of confusing and competing conceptualizations (Purvis et al., 2019), as well as a diverse set of constructs, principles, and measurements (Catlin et al., 2017). One study proposed that the environmental aspects of sustainability are more abstract than the social dimensions (Catlin et al., 2017).

The idea of sustainability emerged in the 1970s as a term employed by policymakers, political parties, and researchers to conceptualize the connection between economic growth and its effects on the environment and well-being of society (Purvis et al., 2019). One of the first references to sustainability was provided by the United Nations' Brundtland Report (1987), which defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 16). What appears as a relatively straightforward explanation in actuality represents a complex concept with ambitious and contradicting objectives, according to many. Sustainability infers that the survival of human civilization depends on careful management of economic development in a manner that protects the future availability of natural resources needed for human existence and ensures equitable sharing of both costs and benefits. The so-called three pillars (environmental, social, and economic) are widely accepted amongst policymakers and researchers as the core interdependent dimensions of sustainability.

However, there is lack of clarity on the importance of each pillar and how they optimally interact with one another. As a result, people tend to interpret sustainability based on their own priorities, often hindering a united course of action (Purvis et al., 2019).

Despite proliferate public conversation about sustainability and its three pillared-approach, consumers associate it mostly with environmental dimensions, followed by longevity and, to a much lesser extent, with social and economic factors (Catlin et al., 2017; Simpson & Radford, 2014). Other sustainability associations include femininity (Brough et al., 2016), political liberalism (Kidwell et al., 2013), low quality (Luchs et al., 2010; Pickett-Baker & Ozaki, 2008) and inconvenience (Frederiks et al., 2015). Consumers not only have varying interpretations of sustainability, but also of the types of activities associated with it (Catlin et al., 2017; Simpson & Radford, 2012). Lack of unified measurements, or understanding of what these measurements mean, add to the ambiguity and insufficient commitment (Catlin et al., 2017). Furthering the confusion, sustainability is often closely associated with prosocial behaviors such as donations, helping others, and Corporate Social Responsibility (CSR) which refers to a company's policy to limit its impact on the environment and society by considering the impact of its decisions not only on customers and shareholders, but also on employees, communities, and other partnerships (Trudel & Cotte, 2009). The overall lack of concreteness surrounding the concept of sustainability makes it challenging for society to embrace consumption behaviors connected with it.

Limited Adoption of Sustainable Consumption Behaviors

A growing body of research examines psychological factors linked to adoption of sustainable consumption behavior (Griskevicius et al., 2012; Steg & Vlek, 2009; Stern, 2000; Trudel, 2019; Weber, 2016; White et al., 2018). In accordance with the literature, sustainable consumption is optimally defined as actions or intentions to benefit or reduce adverse effects

on the environment (Stern, 2000; Trudel, 2019). Adoption of sustainable consumption habits requires collective action from multiple stakeholders at a macro, meso, and micro level.

Although the literature has mostly investigated single behaviors, total sustainable consumption is continuous and made up of many individual acts which are often part of daily behavioral patterns related to the household and mobility (Peattie, 2010; Verplanken & Roy, 2016). Varying degrees of adoption of sustainable consumption behaviors exist, not only between different consumers, but also for each individual consumer. For example, a person may adhere to sustainability and engage in actions that demonstrate sustainability in some areas (e.g., recycling), yet may fail to do so in other areas (e.g., travel) (Steg & Vlek, 2009). Often, sustainable behaviors are adopted for reasons other than sustainability, such as convenience or costs (Stern, 2000). Moreover, sustainable consumption behaviors depend not only on consumers' willingness to participate, but on contextual factors such as infrastructure, availability, and costs of sustainable options (Steg & Vlek, 2009; Stern, 2000).

The disconnect between people's environmental beliefs and their inability or unwillingness to change their consumption behavior has been addressed in the sustainable consumption literature. Several important intrinsic and extrinsic factors that influence people's adoption of sustainable consumption have been identified. Intrinsic determinants include social norms (Abrahamse & Steg, 2013; White & Simpson, 2013), personal values and beliefs (Lindenberg & Steg, 2007; Stern 2000; Weber, 2016), identity (Black et al., 1985; Peloza et al., 2013; Trudel et al., 2019), habits (Donald et al., 2014; Verplanken & Roy, 2016), feelings of personal responsibility (Wells et al., 2011) and emotions (Luchs et al., 2010; O'Neill & Nicholson-Cole, 2009). Extrinsic levers such as convenience (Frederiks et al., 2015; McKenzie-Mohr, 2000; Pichert & Katsikopoulus, 2008), financial rewards (Bowles, 2008) and product characteristics (Trudel & Argo, 2013; Trudel et al., 2016) have also been studied. Most research has investigated factors that impact consumers' adoption of

sustainable consumption within the realms of a specific sustainable activity, such as recycling (White et al., 2011; Winterich et al., 2019), energy conservation (Attari et al., 2010; Goldstein et al., 2008), purchase of eco-friendly products (Ehrich & Irwin, 2005; Pickett-Baker & Ozaki, 2008; Trudel & Cotte, 2009) and transportation (Bamberg, 2006; Donald et al., 2014; Walker et al., 2015). For example, using this approach, a study of recycling observed people's recycling behavior and found that consumers were more likely to recycle a product (versus trashing it) when the product is linked to their identity (i.e., fit or reflect their desired self), because trashing a product linked to one's identity poses an identity threat (Trudel et al., 2016). Few studies have examined factors that can influence consumers' holistic shift (such as adopting a combination of recycling, reusage, energy conservation, and transportation choices) to more sustainable consumption behaviors (Peattie, 2010).

Construal and Construal Level Theory

Overview

Construal is a subjective process of comprehension and interpretation, which can require transcending the 'here and now' to infer information that is not readily available (Bruner, 1957; Griffin & Ross, 1991; Soderberg et al., 2015). CLT establishes the link between a person's level of construal (low to high) and how concretely something is interpreted. It posits that a low level of cognitive construal can be used for more concrete representations of information, whereas a high level of construal is required for more abstract representations of information (Liberman & Trope, 1998). To illustrate, level of construal is often measured using Vallacher and Wegener's (1989) behavioral identification form (BIF), which determines how consumers identify with a given set of actions. Respondents are asked to choose between two descriptions of a specific action, such as eating. One option, chewing and swallowing, suggests a more concrete mental representation. It is detailed, specific, and includes secondary features to describe how an action is to be performed. The second option,

getting nutrition, indicates a more abstract mental representation. It is higher order, with goal orientated features describing why an action should be performed.

According to CLT, levels of construal are systematically influenced by psychological distance, which describes the level of divergence (proximal to distal) from the direct experience of 'myself, here and now' (Liberman & Trope, 1998; Trope & Liberman, 2010). An event that will occur in one hour, an object on your desk, the opinion of a best friend, or the present feeling of hunger are illustrations of varying forms of psychological proximity. In contrast, an event that occurs in the future, an object in another country, a person from a different cultural background, or the uncertain existence of a phenomena are considered psychologically distal. CLT identifies four core dimensions of psychological distance: temporal, spatial (physical location), social (relationship to others), and hypotheticality (certainty of occurrence) (Liberman et al., 2007). Each dimension is supported by experimental evidence and is interrelated with the propensity to influence one another (Bar-Anan et al., 2007).

To cognitively process psychologically proximal versus psychologically distal objects, concepts, and events, people rely on varying levels of construal (Liberman & Trope 1998). When people feel psychologically proximal to something, they tend to construe it more concretely, employing low levels of construal. Construal of distal concepts entails cognitively managing and processing far more information, and given this may be nearly impossible, a higher level of construal is required and the construal becomes far more abstract. So distal concepts require people to transcend psychological distance by simplifying and reducing inputs to fewer, more primary elements (Liberman & Trope, 2003). Figure 2 summarizes the relationships between psychological distance, level of construal (low to high), and construal (concrete to abstract).

Figure 2

Relationship between Psychological Distance, Construal Level, and Construal

Core Determinants of Construal

In social psychology, construal is an essential cognitive process that influences people's judgement and decisions based on two dimensions: construct construal and individual construal. Constructs are inherently perceived at varying levels of construal, meaning they are generally interpreted as being more abstract or more concrete (Trope et al., 2007). For instance, in the context of charity donations, donating time is perceived as more abstract while donating money is perceived as more concrete (Macdonnell & White, 2015). Importantly, construct construal can be manipulated with an external intervention such as messaging (Fujita et al., 2006), which ultimately influences behavior. Packard and Berger (2020) demonstrated that using more concrete language in product customer service messaging resulted in higher customer satisfaction and willingness to purchase.

Individuals also have distinct chronic levels of construal, which describes how concretely or abstractly they are generally inclined to process information (Vallacher & Wegener, 1989). It has been found that individuals with chronic abstract construal worldview are better able to connect with more abstract concepts such as sustainability as it has most

typically been presented. They tend to make judgements and decisions according to primary

features based on values, ideology, and the overall desirability of achieving an outcome,

regardless of how feasible they may be (Freitas et al., 2001). Contrastingly, individuals with

more concrete chronic construal relate more easily to concepts that are more concrete and

tend to make judgements and decisions on secondary features which describe specific

attributes or how to achieve an outcome (Trope & Liberman, 2010). Demographic differences

have been revealed such that older consumers and Chinese consumers have a higher tendency

of more abstract level of construal (Hong & Lee, 2010). Yet, as with construct construal,

individual chronic construal can be situationally manipulated with messaging. For instance,

an abstract (concrete) individual level of construal can be activated by asking consumers to

think about the future (present) (Reczek et al., 2018; Trudel, 2019; Zaval et al., 2015), focus

on the local (global) impact of an activity (Li et al., 2011; Spence et al., 2012), or think about

why (how) they would do something (Freitas et al., 2004).

Construal and Behavior

Construct construal is an important determinant of behavior. Abstract levels of

construal encourage behavior that has to do with values and ideals, while concrete construal

encourages decisions based on feasibility, or how to achieve outcomes (Trope & Liberman,

2010). Several studies have demonstrated that it is possible to influence how concretely a

person construes something with an external intervention such as messaging (Fujita et al.,

2006), which can play an important role in guiding their associated attitudes and behaviors

(Griffin & Ross, 1991; Soderberg et al., 2015, Trope & Liberman, 2010). This can be

achieved in two ways: i) match the level of construct messaging to the chronic level of

construal of an individual or ii) situationally activate a more or less concrete construal level

in an individual by shifting perceptions of psychological distance to the construct during the

decision-making process (Reczek et al., 2018). For example, White et al. (2011) suggests that

matching loss framing messaging (e.g., think about what will be lost in our community if we do not keep recycling) with concrete consumers and gain framing (e.g., think about what will be gained in our community if we do not keep recycling) with abstract consumers prompts a more positive attitude toward and increased engagement in recycling behavior. Moreover, activating an abstract mindset by having consumers consider their future legacy influences behavior associated with abstract constructs (increased donations to a charity, pro-environmental intentions, and climate change beliefs) (Zaval et al., 2015).

Construal and Sustainable Behavior

Research suggests that sustainability, as well as many of its ramifications, including climate change, extreme weather, and social injustice, are perceived as abstract. Outcomes are regarded as uncertain, impacting future generations, transpiring in far-away places, and experienced by social groups which are far removed from oneself (Arnocky et al., 2014; Leiserowitz et al., 2019; Reczek et al., 2018; Spence et al., 2012; Weber, 2015). Furthermore, widespread usage of greenwashing in which the environmental friendliness of products is oversold has led to a general sense of distrust and uncertainty (Chen & Chang, 2013). Because embracing the current conceptualization of sustainability requires consumers to transcend many dimensions of psychological distance, it is generally perceived as abstract, and this abstractness renders it difficult for consumers to make the necessary connection for behavioral change (Griskevicius et al., 2012; Reczek et al., 2018; White et al., 2018).

Several proposals on how to concretize the concept of sustainability have been made. These include focusing on local issues and impact (Li et al., 2011; Spence et al., 2012), making effects more visible (Weber, 2015), social influence and establishing smaller, achievable milestones (White et al., 2019), focusing on future generations and legacy (Trudel, 2019; White et al., 2011; Zaval et al., 2015), outlining clear steps, employment of imagery and analogies (Reczek et al., 2018), outcome potential (Winterich et al., 2019), and

communication of concrete experiences (Marx et al., 2007). To my knowledge, the literature has not addressed specific measures to holistically reframe the concept of sustainability to address its abstractness.

The Circular Economy & Circularity

Circularity as a Credible Solution

The circular economy (CE) represents an innovative economic model and credible solution to achieving sustainable growth by offering a straightforward perspective on what needs to change. Instead of a reliance on continual expansion through stimulation of mass production, mass consumption, and rapid disposal (coined as the linear economy), economic expansion stems from circularity. CE is defined here as the ongoing reutilization of resources and materials with the ultimate goal of generating zero waste (Esposito et al., 2018). For perspective, according to the Circularity Gap Report (Circle Economy, 2020) presented at the World Economic Forum, the world is 8.6% circular, suggesting that 91.4% of resources used for consumption are being squandered. This presents tremendous opportunity for discovering innovative solutions to create value from immense quantities of wasted resources. Circularity, which is "restorative and regenerative by design" (Ellen MacArthur, 2012, p. 6), represents a new paradigm for future prosperity with minimal environmental degradation. It differs from other models of sustainability in that the focus is on finding novel ways to reuse existing materials and resources which are currently being wasted (Esposito et al., 2018).

Adoption of Circularity has Commenced

From policy and business perspectives, adoption of circularity has already commenced. Legislative adoption of circularity is most prevalent in Asia and Europe. China began implementation of the concept as a development strategy in 2002 and in 2009 the 'Circular Economy Promotion Law of the People's Republic of China' took effect (Geisendorf & Pietrulla, 2018). The European Commission followed in 2015 with the

adoption of the Circular Economy Action Plan. They updated this plan in 2018, with the core objectives of environmental preservation and keeping the EU at the forefront of a competitive global marketplace (European Commission, 2018). Top tier networks of business, innovators, cities, governments, researchers, and thought leaders, such as the Ellen MacArthur Foundation, were founded to accelerate diffusion. CE has become an ongoing agenda item at prominent global political meetings such as the World Economic Forum. A study by McKinsey predicted that adoption of a CE in the EU, where implementation has already commenced, could create a net economic benefit of EUR 1.8 trillion, two million additional jobs, and a 48% reduction in CO_2 emissions by 2030 (Schulze, 2016).

Although often not conceptualized as circular, many circular business practices have been established and, in some cases, become mainstream. According to Moreno et al. (2016), there are five types of circular business practices, all of which have varying degrees of adoption: circular supplies, resource value recovery, product life extension, product service systems (PSS), and collaborative consumption (sharing).

Circular supplies ensure residual outputs from one process are used as inputs for other processes. Zero waste production and switching to renewable resources, including energy, are high impact examples of circular supplies. For instance, General Motors recycles 90% of its worldwide manufacturing waste, generating $1 billion in annual revenue (Esposito et al., 2018). Moreover, forward looking companies such as Patagonia and Timberland transform recycled material into products, and most major consumer-packaged goods companies have committed to switching to 100% recycled packaging within the next decade (Winterich et al., 2019).

A salient illustration of resource value recovery is remanufacturing, a process of restoring end of life products to new by reusing, rebuilding, and replacing interchangeable components (King et al., 2006). It is most often applied in electronics, machines, and

appliances. Product life extension requires repair and upgrades enabled by modular product designs, often employed in computers and cars. Luxury brands such as Rolex and Patek Philippe sell their products at a premium in part by positioning themselves as long lasting and built to last for the next generation (Bocken et al., 2016). Moreover, second-hand marketplaces such as eBay provide platforms to sell goods after usage.

Product service systems (PSS) is an emerging and often disruptive business practice, whereby companies retain products and sell them as service solutions (Stahel, 2010; Tukker 2015). For example, in order to defend its position in the market against low priced incumbents, Xerox successfully transitioned from selling office copy machines to pay per copy service solutions. Technology is often a critical enabler of PSS (Bressanelli et al., 2018). Netflix and Spotify have demonstrated how virtualization eliminates the need for physical products and creates a profitable service that better meets consumers' needs. Closely related to PSS are sharing platforms, also known as collaborative consumption, which increase utilization rates of products through shared use, access, or ownership (Ertz et al., 2019). Prominent examples of sharing platforms include Uber, Airbnb, urban mobility offerings, crowdfunding, and co-worker office space.

Barriers to Widespread Diffusion

Although governments and businesses have begun to embrace circularity, policymakers and executives have suggested that consumer awareness and adoption remain key barriers to more widespread diffusion (Kirchherr et al., 2018). A review of the scientific and grey papers which define CE found that only 19% include the concept of consumption (Kirchherr et al., 2017), and most studies involving consumers identify barriers and motivators to acceptance of a particular product, industry, or business model (Camacho-Otero et al., 2018). Moreover, concrete measures that drive awareness and comprehension of circularity amongst consumers in a way that motivates them to change their behaviors are still

lacking. Shifting consumer behavior away from deep seeded linear consumption patterns to circularity will be challenging (Camacho-Otero et al., 2018). At the point of purchase, quality, longevity, and repairability should be considered, as well as second hand items or relinquishment of ownership all together. Usage of renewable resources and avoidance of disposal product and packaging options is critical. Product life extension during usage requires proper care and a sense of attachment or feeling of stewardship, as well as a willingness to repair, even if it is less expensive and more convenient to replace. After usage, consumers should assume responsibility to properly return or recycle the product (Camacho-Otero et al., 2018). What is needed is a coherent understanding of consumers' role in a circular system, as well as an overarching and compelling concept which will motivate consumers to participate.

Moving Forward

Implementation of circularity in the marketplace currently emphasizes the operationalization of sustainable development through changes in legislation and a shift to new circular business models. However, encouragingly, based on the tenets of CLT, circularity also offers the opportunity to conceptually reframe sustainability in the minds of consumers, making it more concrete by emphasizing economic expansion through resource reutilization and generation of zero waste. In doing so, circularity addresses an important barrier to more widespread adoption of sustainable consumption behaviors.

Hypotheses

Increasing Engagement in Sustainable Behaviors

One strain of CLT research posits that it is possible to situationally alter how concretely an individual perceives a construct and thus change their attitude and behavior related to that construct. For example, one study demonstrated how students recount the content of a video more concretely when told that it depicts a local university campus versus

a geographically distant campus (Fujita et al., 2006). Another study posits that advertising for holidays that employ vivid pictures is more concrete than an advertisement that only uses descriptive text (Fielder, 2007).

Scholars have also begun to implicitly investigate ways to make sustainability more concrete in order to prompt sustainable behavior. Winterich et al. (2019) indicates that messages that emphasize product transformation increase recycling participation through concretization. In their research, product transformation messaging made recycling outputs more concrete by making them more socially relatable (i.e., showing how recycled waste is used as inputs to produce new tangible products, such as backpacks, which are used by student research participants). These messages demonstrated the feasibility of a certain and achievable outcome (recycled bottles provide raw materials to produce a backpack). Studies on climate change posit that personal, concrete experience with events related to climate change can promote engagement and action by diminishing abstractness (McDonald et al., 2015). Another study showed that when consumers have concrete experiences with extreme weather, they have greater concerns for the otherwise abstract concept of climate change and are more apt to donate money to a global warming charity (Li et al., 2011).

Building on these learnings and consistent with prior work (Reczek et al., 2018; Trudel, 2019; White et al., 2011) as a necessary starting point, I predict that the more concrete a person's construal of sustainability, the more likely they are to engage in sustainable behaviors.

H1: Construal of sustainability (abstract to concrete) is positively related to engagement in sustainable behaviors; the more concrete the construal of sustainability, the greater the engagement in sustainable behaviors.

Thus, interventions that concretize sustainability will motivate consumers to make more concrete, action orientated decisions regarding sustainable consumption behaviors.

Abstract Construal of Sustainability Appeals Less to Individuals Who are Inherently

Concrete

Based on the principles of CLT, variations in individual levels of construal for a particular construct are trans-situational, shaped by several factors such as degree of knowledge, access to information, and overall exposure to the construct (Trope et al., 2007). Another critical determinant is the fact that people have their own inherent ability to process information (Vallacher & Wegener, 1989). Those who process information more concretely prioritize feasibility and often reject concepts linked to goals which appear unachievable (Liberman & Trope, 1998; Rabinovich et al., 2009). They may have difficulty transcending the immediate present in order to comprehend abstract phenomena (Trope & Liberman, 2010). Furthermore, people with concrete construal have been depicted as having less of a propensity to consider the future (Reczek et al., 2018), giving more importance to negatives, contra arguments (Liberman et al., 2004), and notions of prevention (Lee et al., 2010), having less self-control (Fujita et al., 2006), less creative processing style (Förster et al., 2004), and an inability to process conflicting messages (Hong & Lee, 2010). They respond better to loss framing (Chang et al., 2015; White et al., 2011) and monetary appeals (Macdonnell & White, 2015). Reczek et al. (2018) found that eco-friendly products appealed less to people with chronic concrete level of construal. Since issues related to environmental sustainability are abstract in part because they are considered to focus on the future, people with chronic concrete construal have more negative attitudes towards eco-friendly products and are less likely purchase them.

In line with prior work (Reczek, 2018), I predict that individual chronic level of construal (abstract to concrete) is negatively related to engagement in sustainable behaviors. Moreover, because individuals with chronic concrete construal have a worldview that

prioritizes feasibility and proximity, it does not match with the more abstract values and ideologies typically associated with sustainability. As a result, the current abstract concept of sustainability prompts less action from consumers with chronic concrete construal than from consumers with chronic abstract construal. Figure 3 shows the predicted relationships between individual chronic level of construal, construal of sustainability, and engagement and willingness to change behaviors.

Figure 3

Predicted Relationships: Individual Chronic Construal and Sustainable Behavior

Chronic Abstract Construal

| Individual construal matches the abstract construal of sustainability | → | Sustainability more appealing | → | More likely to engage in sustainable behaviors | → | More willing to change consumption patterns |

Chronic Concrete Construal

| Individual construal mismatches the abstract construal of sustainability | → | Sustainability less appealing | → | Less likely to engage in sustainable behaviors | → | Less willing to change consumption patterns |

H2: Individual chronic level of construal (abstract to concrete) is negatively related to engagement in sustainable behaviors; individuals with more (less) concrete chronic construal level engage in fewer (greater) sustainable behaviors.

Concretizing Sustainability with Circularity

When information is construed abstractly, the focus is on desirability, or 'why' an end state should be achieved, based on superordinate goals, values, or ideologies. Information is interpreted using primary features, broader categories, and traits founded on dispositional information. Gestalts, symbols, words (vs. pictures), and aggregate information are often employed in abstract construal (Hamilton, 2015; Soderberg et al., 2015). As constructs

become more psychologically proximal and information is construed more concretely, a cognitive process of concretization begins, whereby broader categories and primary features become narrower and more detailed. The focus shifts from desirability to feasibility, or 'how' an end state is achieved, based on detailed information using subordinate, secondary features (Trope & Liberman, 2010). Examples, visuals, specific behaviors, contextualization, and individualized information can aid in concretization. I hypothesize that the overall concept of circularity from the CE, based on the notion of continuous reusage of resources and materials and generation of zero waste as in nature, has the potential to concretize (i.e., reduce the abstractness) of sustainability in the minds of the consumer. The concept of circularity includes more proximal, concrete features, while sustainability focuses on more distal, abstract features. For instance, circularity connotes the act of endless and continuous return to an original state (Boulding, 1992). It is based on the image of a circle, which provides a concrete visual foundation that is cohesively and holistically integrated throughout the concept. This is exemplified by the name (CE), measurement (circularity), context (linear versus circular), analogy (circularity of nature), and associated behaviors (reduce, reuse, recycle, repair). Importantly, to aid proximity and comprehension, circularity conceptualizes current behavior as the linear economy, as a foundation for contextualization and contrast. New circular business practices, which are already established in the marketplace, provide concrete examples and experiences. To summarize, the CE includes not only overarching goals such as economic and environmental preservation based on desirability and higher order values, but also smaller and more achievable goals based on feasibility and specific behaviors (reuse, recycle, repair, share).

Sustainability, on the other hand, traditionally represents a more distal and abstract phenomenon. It denotes continuity and longevity, inferring desirability of an outcome. The focus is on superordinate goals based on the values and ideology associated with meeting the

needs of future generations and represented by the three pillars of environmental preservation, social justice, and responsible economic growth. Subordinate goals and features are fragmented and ambiguous and consumers often feel overwhelmed, questioning their ability to make an impact (Crittenden et al., 2011). The conceptual underpinnings of sustainability are broad categories represented by its three pillars, although consumers tend to mostly consider only environmental features (Catlin et al., 2017). Other related concepts such as Corporate Social Responsibility (CSR) contribute to lack of clarity and confusion. Underlying contextual features of climate change and environmental degradation are also considered abstract (Spence et al., 2012). Overall, the current concept of sustainability represents an ideological proposition of 'doing good' and is more ambiguous about how to get there. Table 1 summarizes the posited abstract characteristics of sustainability versus the concrete characteristics of circularity from a consumer perspective.

INSERT TABLE 1 ABOUT HERE

Building on these findings that circularity is perceived as more concrete than sustainability, I theorize that reframing sustainability as circularity with messaging for marketing materials or a more extensive intervention that educates the consumer about the circularity has the potential to concretize the concept of sustainability in the eyes of the consumer.

> **H3: Consumers exposed to a message or intervention with circular framing will have a more concrete construal of sustainability than consumers exposed to a message or intervention with traditional sustainable framing.**

Making Sustainability More Appealing for Concrete Individuals

A newer strain of CLT research examines how 'matching' levels of construct construal and individual chronic construal can influence behavior, particularly in the realms of messaging, positioning, and advertising. For example, one study investigated how people with abstract chronic construal are better able to process conflicting messages and respond better to

advertising with both positive and negative appeals versus advertising with only positive appeals (Hong & Lee, 2010). In the area of charitable donations, research has shown that matching messaging with levels of construal for concrete (abstract) individuals for appeals for money (time), proximal (distal) donations, and subjects who are local (far away) can influence desired donation behavior (Ein-Gar & Levontin, 2013; Fujita et al., 2006; Macdonnell & White, 2015). Finally, Zhao and Xie (2011) found that matching product recommendations from socially proximal consumers (concrete) is effective in prompting immediate consumption, whereas recommendations from distal social groups (abstract) have more impact for future purchases.

Research has investigated matching messaging with regards to sustainability to individual chronic level of construal (i.e., using abstract messaging to appeal to more abstract people and concrete messaging to appeal to more concrete people). For example, highlighting (concrete) economic benefits prompts purchase of environmentally friendly products amongst consumers with more concrete construal (Goldsmith et al., 2019) while usage of prosocial messaging (abstract) for sustainable products leads to a higher level of adoption amongst consumers with situationally activated abstract construal based on scarcity messaging (Goldsmith et al., 2019). In another example, advertising showing a tire using general messaging (good for the environment) was not as effective in driving purchases as an ad that provided more details as to why it is good for the environment (Reczek et al., 2018).

I hypothesize that because circularity offers a more concrete representation of sustainability, it will better match the mindset of individuals with a more concrete chronic level of construal versus individuals with a more abstract chronic level of construal. As a result, it will have a more pronounced effect on concretizing their construal of sustainability and engagement in sustainable behaviors. More specifically, I predict that interventions that frame sustainability as circularity will have a stronger effect in concretizing construal of

sustainability and, in turn, prompt engagement in sustainable behaviors for more chronically

concrete individuals than for more chronically abstract individuals.

H4: Individual chronic level of construal moderates the relationship between construal of sustainability and engagement in sustainable behaviors such that the relationship is stronger the more concrete a consumer's chronic level of construal.

H5: Individual chronic level of construal moderates the impact of the circular framing intervention/message on construal of sustainability, such that the effect of the intervention/message is stronger the more concrete the individual's chronic level of construal

CHAPTER 3: RESEARCH DESIGN AND METHODS

Overview

The research encompasses a total of four studies to test the proposed model. Study 1 employed a national, cross-sectional survey to assess whether more concrete construal of sustainability is related to more engagement in sustainable behaviors (H1) as well as the role of individual chronic level of construal in affecting sustainable behaviors (H2) and moderating the relationship between construal of sustainability and sustainable behavior (H4). Studies 2 and 3 utilized experimental designs that also evaluated the effect of various interventions/messages to frame sustainability as circularity (H3) and the moderating role of an individual's chronic level of construal (H5): study 2 evaluated packaging with circular framed messaging versus sustainably framed messaging, while study 3, longitudinal in design, tested the immediate and lagged effect of a short educational video about the CE. Study 4, a correlational study, focused on commonly used sustainable marketing claims for household care products to validate whether circular framed marketing messages are perceived as more concrete than sustainably framed marketing messages (H3), and to assess whether this relationship is stronger for more concrete individuals (H5). Table 2 provides an overview of the studies conducted for this research and the pre-studies developed for each.

INSERT TABLE 2 ABOUT HERE

CHAPTER 4: DATA ANALYSIS AND FINDINGS

Overview of Pre-Study 1A, Pre-Study 1B, and Study 1

Study 1 had two goals: to test the relationships between construal of sustainability, sustainable behavior, and individual level of chronic construal and to validate measurements of these constructs. Two pre-studies assessed a new measurement for construal of sustainability and determined ecological validity of measures used in the main study.

Pre-Study 1A

The first pre-study aimed to validate a reliable measurement for construal of sustainability, the central construct of this research. Validated instruments for construct construal are lacking in academic research. For example, Macdonnell and White (2015) employed several measurements of construct construal, including a concrete to abstract rating item, specifics to generalities rating items ($\alpha = .70$), and the Behavioral Identification Form (BIF: Vallcacher & Wegener, 1987) as a temporary state measure to assess the level of construal activated (versus its traditional use as a chronic trait measure). Other studies have utilized measurements pertaining to psychological distance (e.g., focus on past/future) (Reczek, 2018), identifying gestalts from fragmented pictures (Wakslak, 2006), or analyzing written descriptions of the construct for abstractness of language based on the Linguistic Categorization Model coding scheme from Semin and Fielder (1998) (Fujta et al., 2006).

To address this important issue, I adapted a scale from Laroche et al. (2001), which was developed to measure the tangibility of products and services in the context of digitalization. The instrument has been validated by Nepomuceno et al. (2013). The original scale identified three dimensions of tangibility: physical, mental, and generality. Physical tangibility factor items were omitted from this research; I retained only mental factor items, adopted from McDougall and Snetsinger (1990), and generality factor items, originating from

Dubé et al. (1990). 3 of six mental factor items were negatively worded and needed to be reverse coded. All items were adapted to a 7-point Likert scale from a 9-point scale.

Methods

Participants

Participants were recruited from the Prolific crowdsourcing platform to complete an online survey. The sample consisted of 418 adult respondents who were familiar with the social media platform TikTok. 8 participants who did not complete the questionnaire in full were removed for data analysis purposes, resulting in a sample size of 410. 60% of the participants were female ($M = 31.18$ years old; $SD = 3.02$).

Procedure

Testing was conducted as part of a larger, unrelated study on consumer attitudes to cognitive enhancers. The scale was tested with five constructs: the sustainability construct and four other constructs that had previously been validated as either concrete or abstract by Kroll and Merves (1986). Each participant completed the Construct Construal Scale for two of five constructs, which were randomly assigned. In addition to the construct of sustainability, the pretest included two previously tested concrete and abstract constructs (hotel/hospital and truth/attitude), validated by Kroll and Merves (1986). That study tested 202 terms rated from highly abstract (1) to highly concrete (7) accounting for word length (i.e., number of letters) and frequency of term usage. The concrete constructs, hotel ($M =$ 6.54) and hospital ($M = 6.62$), and the abstract constructs, truth ($M = 1.86$) and attitude ($M =$ 2.25), found in that research were selected for use in this research.

Measurements

The Construct Construal scale includes six mental items rated on a seven-point scale anchored by Strongly Disagree (1) and Strongly Agree (7). Two example items from this scale are: "I have a clear picture of this item" and "This item is easy to describe to another

person." In addition, two generality items using a seven-point scale anchored by Extremely General / Abstract (1) to Extremely Specific / Concrete (7) were included. These items were phrased, "I feel that this item is very general to very specific" and "I feel that this item is very abstract to very concrete." The order of all items was randomized within each construct. The survey closed with nine demographic items including gender, age, race/ethnicity, employment status, level of education, marital/live-in partner status, number of children, size of household, and annual income.

Analytical Approach

Because each participant rated two constructs, the dataset was restructured from wide to long, adding a participant ID to capture the within-subject component. The 8-item measure of construct construal was examined using an exploratory factor analysis (EFA) to investigate the underlying structure of the measurement items both across the entire dataset of five constructs as well as for each individual construct. Internal consistency reliability testing assessed the adequacy of the measurement for substantive analysis. In addition, mean construal scores for each construct were compared using ANOVA to determine whether concrete constructs were perceived as concrete and abstract constructs as abstract.

Pre-Study 1A's Results

Pre-Study 1A was conducted to investigate whether this new scale could validly measure a construct's construal, including the construct of sustainability.

Exploratory Factor Analysis

Based on the dataset pulled across all five tested constructs, I conducted a principal component analysis (Hotelling, 1933) to test the measure's reliability and internal structure. Using varimax rotation based on cut off criterion of .40 for factor loadings and eigenvalues of 1.0 and above for all five constructs, the items loaded onto two factors and explained 60.36% of the variance. A review of the rotated component matrix shows that positively worded

items loaded onto one factor, while negatively worded items loaded onto a second factor. This reflects a method effect, whereby positively and negatively worded items of a scale load onto different factors in an EFA (Brown, 2003). Results for each individual construct were in line with this, except for hotel. For that construct, two of the items ("I have a clear picture of this item" and "The image of this item comes to my mind right away") loaded onto both components. As expected, the PCA analysis results varied from the original Laroche et al. (2001) tangibility scale which included three factors (physical, mental, and generality)

Reliability

Cronbach's Alpha for the 8-item-scale was 0.76. The inter-item correlation and corrected item total correlation matrices showed low correlations for "I feel that this item is very general to very specific", indicating the possibility to remove this item. Because removing this item would result in only a minor increase in Cronbach's Alpha to 0.77, the item was retained, and the scale was used in subsequent studies.

Comparison of Tested Constructs' Construal

A one-way between groups ANOVA was conducted to compare the five constructs' construal. Results revealed that these constructs indeed differ on perceived level of abstractness/concreteness [$F(4) = 27.16$, $p < .001$]. Post hoc comparisons using the Bonferroni correction method indicated that, as expected, concrete concepts were perceived as concrete, abstract concepts as abstract, and the concept of sustainability was perceived as abstract. These findings reiterated the ecological validity of attempting to concretize it. More specifically, the mean score for concrete concepts (hotel and hospital) ($M = 5.10$, $SD = 1.14$) was significantly different than the mean score for abstract concepts (truth, attitude, and sustainability) ($M = 4.37$, $SD = 1.00$); $t(162) = 7.62$, $p < .001$. Moreover, the mean score for hotel (concrete) ($M = 5.22$, $SD = 1.13$) was significantly different than the abstract constructs truth ($M = 4.50$; $SD = 1.08$); $p < .001$, 95% CI [.387, 1.04], attitude ($M = 4.45$; $SD = 0.98$); p

< .001, 95% *CI* [.442, 1.09], and sustainability (*M* = 4.29; *SD* = 0.89); *p*<.001, 95% *CI* [.600, 1.25]. The mean score for hospital (concrete) (*M* = 5.13, *SD* = 1.12) was also significantly different than the abstract constructs truth; *p* < .001, 95% *CI* [0.30, 0.96], attitude; *p* < .001, 95% *CI* [0.36, 1.01], and sustainability; *p*<.01, 95% *CI* [0.52, 1.16]. There was no significant differences between concrete constructs; *p* = 1.000, 95% *CI* [-.24, .41] or between abstract constructs truth and attitude; *p* = 1.000, 95% CI [-0.28, 0.38] and sustainability; *p* = .684, 95% *CI* [-0.11, 0.54]. Based on these results, the scale was used in subsequent studies without any changes. Table 3 shows the factor loadings and commonalities for Pre-Study 1. Table 4 shows the correlations and descriptive statistics for Pre-Study 1. Table 5 shows the mean scores for the Bonferroni adjusted pairwise t-tests

Table 3

Factor Loadings and Commonalities, Pre-Study 1

	Factor loading	
Factor Item	Positively worded items	Negatively worded items
Positively Worded Items		
I have a clear picture of this item	.77	
The image of this item comes to my mind right away	.76	
This item is easy to describe to another person	.70	
I feel that this item is very general to very specific	.63	
I feel that this item is very abstract to very concrete	.73	
Negatively Worded items		
This item is a difficult item to think about (R)		.83
I need more information about this item to make myself a clear idea of what it is (R)		.84
This item is not that easy to picture (R)		.81

Table 4

Correlations and Descriptive Statistics, Pre-Study 1

	Mean (SD)	1	2	3	4	5	6	7	8
Clear picture (1)	5.19 (1.64)	1	.60**	.29**	.20**	.26**	.48**	.30**	.47**
Image comes to mind (2)	5.03 (1.69)		1	.25**	.17**	.27**	.47**	.31**	.43**
Difficult Item (3)	4.78 (1.82)			1	.55**	.56**	.16**	-.01	.19**
Need more information (4)	4.49 (1.95)				1	.55**	.15**	-.04	.10**
Not easy to picture (5)	4.63 (1.19)					1	.19**	.06	.20**
Easy to describe (6)	4.93 (1.74)						1	.25**	.39**
General to specific (7)	4.27 (1.88)							1	.36**
Abstract to concrete (8)	4.44 (1.79)								1

* Correlation is significant at the 0.01 level (2 tailed)
** Correlation is significant at the 0.05 level (2 tailed)

Table 5

Bonferroni Adjusted Pairwise t-tests, Pre-Study 1

ANOVA		Constructs					
Constructs		Hotel (A)	Hospital (B)	Truth (C)	Attitude (D)	Sustainability (E)	Total
Level of Construal (1=highly abstract, 7=highly concrete)	*N*	164	165	161	163	167	820
	Mean	5.22	5.13	4.50	4.45	4.29	4.72
	SD	1.13	1.12	1.08	0.98	0.89	1.11
		C,D,E	C,D,E				

These results were based on two sided tests. The dataset was restructured from wide to long. For pairs where the mean difference is significant, the key of the smaller construct appears in the construct with the larger mean. Significance level for upper-level cases (C, D, E) was .05.

Pre-Study 1B

The goal of the second pre-study was to establish ecological validity of the measures used in the main study design. 9 consumers were recruited using convenience and snowballing sampling. 6 of nine participants were female ($M = 33.56$ years old; $SD = 15.68$). Each participant was administered the questionnaire for the main study over the phone and then provided qualitative feedback regarding the survey flow and ecological validity of measures. Minor adjustments to instructions were made to the questionnaire because of this feedback. In addition, a panel of three academics provided feedback on measurement tools.

Study 1

Study 1 tested the relationships between construal of sustainability, sustainable behavior, and individual level of chronic construal and validated measurements of these constructs

Methods

Participants

  A sample of 500 U.S. national respondents was recruited from the Prolific crowdsourcing platform to participate in an online survey for monetary compensation. 51.24% of participants were female ($M = 45.40$ years old; $SD = 15.89$). 18 respondents who did not pass at least one of the three attention check questions were removed for data analysis purposes ($n = 482$).

Procedure

  Participants were informed that that the purpose of the research was to gain an understanding of their perception of sustainability, sustainable messaging, and the associated effect on sustainable consumption behaviors. The survey measured respondent's individual chronic level of construal, engagement in sustainable behaviors, interest in receiving more information or downloading an app about various sustainable topics, attitude and values towards sustainability, construal of sustainability, psychological distance to sustainability, and awareness and knowledge of the CE. The items within each section were randomized, and nine demographic items were incorporated at the end of the questionnaire.

Measurements

- Behavioral Identification Form (BIF)

The validated 25-item Behavioral Identification Form (BIF) (Vallacher & Wegner, 1989) was used to capture individual chronic level of construal, the proposed moderator of the current study. BIF measures an individual's chronic level of construal through action identification: an action (e.g., making a list) is presented and respondents select one of two descriptions which they believe is most appropriate. One option, which represents concrete identification, describes how an action is performed (e.g., for making a list - writing things down), while the other option, representing abstract identification, describes why an action is

performed (e.g., for making a list - getting organized). Abstract identification answers were recorded as 0 and concrete identification answers as 1. Individuals were assigned a numerical level of chronic concreteness between 1 and 25 based on summed scores. Lower-level scores indicated a more abstract level of individual chronic construal, while higher-level scores suggested a more concrete level of chronic construal. Results showed a mean score for individual chronic level of construal of 10.79, $SD = 6.23$. The Cronbach's alpha for the 25-item scale was 0.89, indicating the measure has high internal consistency in line with previous research.

- Sustainable Behavior Scale

To assess the level of engagement in sustainable behaviors, the core dependent variable, respondents answered the 7-item Sustainable Behavior Scale measuring the frequency of various sustainable behaviors (1 = Never and 5 = Always). The instrument was adopted from Finisterra do Paço and Reis (2012) who examined factors influencing green advertising ($\alpha = .71$). It was originally sourced from a scale from Pickett et al. (1995) ($\alpha = .75$) (Bruner, 2015). Scores were summed, with higher scores indicating a higher level of engagement in sustainable behaviors and lower scores representing a lower level of engagement in sustainable behaviors ($M = 3.34$, $SD = .66$). The Cronbach's alpha for the scale was 0.67.

- Exploratory Sustainable Behavior Measures

As an exploratory dependent variable measure, propensity to engage in sustainable behaviors was captured by measuring interest in receiving information and downloading sustainable apps on various sustainable topics (0 = Not Interested, 1 = Interested). Sustainable information included 13 topics (e.g., How to Fix Items Rather than Replace them, Best Eco Grooming Products) while sustainable apps included 11 choices (e.g., Ecosia, a search engine that donates the profits from ads to plant trees and 'Good on you' which helps consumers make informed sustainable choices when buying clothes). Appendix B provides a full

breakdown of these topics. Items were summed for everyone, and individuals received a numerical score from 0 to 24, with low scores indicating low interest in engaging in sustainable behaviors and high scores indicating high interest in engaging in sustainable behaviors (M = 13.18, SD = 7.69). The Cronbach's alpha was 0.95. The variable was also explored as two separate variables. The first was interest in receiving information about sustainable topics with individual scores ranging from 0, low interest, to 13, high interest, (M = 8.30, SD = 4.54). The second was interest in downloading sustainable apps with scores ranging from 0, low interest, to 11, high interest, (M = 4.89, SD = 3.80).

- Green Consumption Values Scale (GCVS)

To assess how individuals value the environment, participants completed the 6-item Green Consumption Values Scale (GCVS). This scale originated from Haws et al. (2014) and later validated by Reczek et al. (2018) (α = .93). The measurement was validated as a potential covariate and alternate pathway. Items were evaluated on a 7-point Likert scale, anchored by 1= Strongly Disagree and 7 = Strongly Agree. Items were averaged, resulting in a mean score of 4.98 with a SD = 1.12. The Cronbach's alpha was 0.91, indicating the items had high internal consistency.

- Construct Construal Scale

Construal of sustainability, the core predictor variable, was captured by the Construct Construal Scale validated in the pre-study. Items were averaged, resulting in a mean score of 4.27 and a SD = 1.12. This was in line with the results of the pre-study (M = 4.29, SD = 0.89). The Cronbach's alpha was 0.86, confirming the scale's high reliability.

- Psychological Distance

Individual psychological distance to sustainability was captured using a scale adapted from Spence et al. (2012) which measures perceived distance to the four core dimensions of psychological distance (temporal, spatial, social, and hypothetical) (Trope & Liberman,

2010). The last item (Please rate the degree to which sustainability feels very close to very far away) was adapted from a two-item measure of the perceived psychological distance of experiences (Van Boven et al., 2010), originating from Ross and Wilson (2002). The item was modified from a 10 to a 7-point scale. The 5 items were averaged, with lower scores indicating psychological distance to sustainability and higher scores psychological proximity to sustainability ($M = 5.15$, $SD = 0.96$). The Cronbach's alpha was 0.77.

- Awareness and Knowledge of the CE

To determine consumers' level of awareness and knowledge about the CE in relationship to other sustainability concepts, participants were asked whether they were aware of (i.e., No or Yes) and to what extent they are knowledgeable about the following concepts: climate change, biodiversity, CE, carbon footprint, and biomass. Knowledgeability was scored on a Likert scale between 1 = Not at All and 5 = Extremely.

- Demographics

9 demographic items were captured including gender, age, race/ethnicity, employment status, level of education, marital/live-in partner status, number of children, size of household, and annual income.

Analytic Approach

Pearson correlations analysis was conducted to assess correlations between constructs. To determine which demographic variables to include as covariates in the model, I ran a series of multiple linear regressions to assess whether construal of sustainability (IV), level of chronic construal (moderator), and sustainable behaviors (DV) varied as a function of the participant's demographic characteristics. A regression analysis using PROCESS by Andrew F. Hayes Model 1 was conducted to determine the main effect of construal of sustainability on sustainable behaviors (H1), the main effect of individual chronic level of construal on sustainable behaviors (H2), and the interaction effect of individual chronic level of construal

on the relationship between construal of sustainability and sustainable behaviors (H4). Construal of sustainability was entered as the predictor variable, sustainable behavior as the outcome variable, and chronic level of construal as the moderator of the relationship between construal of sustainability and sustainable behaviors. The analysis controlled for age, gender, marital status, and higher education.

A Johnson-Neyman floodlight approach was employed to explore the interaction effect of individual chronic level of construal on the relationship between construal of sustainability and sustainability. Alternative measures including interest in sustainable information apps as a DV and psychological distance as an IV were also assessed using regression.

Study 1's Results

The objective of Study 1 was to assess whether more concrete construal of sustainability is related to higher engagement in sustainable behaviors (H1), assess the role of individual chronic level of construal on sustainable behaviors (H2), and its moderating effect on the relationship between construal of sustainability and sustainable behavior (H4).

Correlations and Covariates

Pearson correlation analysis revealed correlations between constructs as anticipated. More concrete construal of sustainability was correlated with more engagement in sustainable behaviors ($r = .28$, $p < .001$), greater interest in receiving sustainable information and downloading sustainable apps ($r = .15$, $p < .001$), placing higher value on the environment ($r = .35$, $p < .001$), and higher psychological proximity to sustainability ($r = .44$, $p < .001$). A more concrete level of individual chronic construal was negatively correlated with a less concrete construal of sustainability ($r = -.24$, $p < .001$), psychological distance to sustainability ($r = -.11$, $p = .015$), placing lower value on the environmental ($r = -.22$, $p < .001$), less engagement in sustainable behaviors ($r = -.197$, $p < .001$), and less interest in

receiving sustainable information and downloading sustainable apps ($r = -.12$, $p < .010$).

Although concrete chronic level of construal correlates negatively to receiving sustainable

information ($r = -.13$, $p < .001$), there was no significant correlation to downloading

sustainable apps ($r = -.08$, n.s.).

A series of multiple linear regressions assessed whether construal of sustainability,

chronic level of construal, and sustainable behaviors varied as a function of the participant's

demographic characteristics. The overall regression for construal of sustainability was not

significant [$F(16,48) = 1.65$, n.s., Adjusted $R^2 = .02$] but revealed that age ($\beta = .13$, $p = .049$)

was significantly related to construal of sustainability. For individual level of chronic

construal, the overall regression equation was not significant, [$F(16, 48) = 1.41$, n.s.,

Adjusted $R^2 = .01$] and no regression coefficients were significant. For sustainable behavior,

the regression equation was significant [$F(16, 48) = 3.45$; $p < .001$, Adjusted $R^2 = .08$] and

the following demographic variables were significant: age ($\beta = .23$, $p < .001$), gender ($\beta =$

$.16$, $p < .001$), and being married or living with someone ($\beta = -.11$, $p = .035$). Finally for

acquiring sustainable information and apps, the regression equation was significant,

[$F(16,47) = 3.31$, $p < .001$, Adjusted $R^2 = .07$] and higher education was significant ($\beta = .20$,

$p < .001$). Based on this analysis, the main analysis included the following covariates: gender,

age, marital status, and higher education.

Causal Relationships

As predicted by H1, there was a positive main effect of construal of sustainability on

sustainable behaviors ($\beta = .15$, $p < .001$), indicating the more concrete the construal of

sustainability, the higher the level of engagement in sustainable behaviors. There is also a

negative main effect of individual chronic level of construal on sustainable behaviors ($\beta =$

$-.01$, $p = .005$) as predicted by H2. This result indicated that the more concrete the chronic

level of construal, the less engagement in sustainable behavior. Moreover, these main effects

are qualified by a significant interaction: individual chronic level of construal moderates the relationship between construal of sustainability and engagement in sustainable behaviors (β = -.01, p = .043). An analysis at +1 standard deviation (more concrete individuals) and –1 standard deviation (more abstract individuals) showed that the relationship between construal of sustainability and sustainable behavior is significant at all levels of chronic level of construal. I also explored the interaction effect of individual chronic level of construal on the relationship between construal of sustainability and sustainability using the Johnson-Neyman floodlight approach. Results indicated that the relationship between concrete construal of sustainability and sustainable behaviors is significant amongst most individuals (with chronic levels of construal equal or lower than 19.13 accounting for 90.79% of respondents). Contrary to H4, only for very concrete individuals (with chronic level of construal above 19.13, representing 9.21% of respondents) the relationship was not significant.

Evaluation of Alternative Dependent Measures

The same regression analysis was also conducted with the exploratory DV, interest in sustainable information, and apps as the primary DV. There were significant main effects of both construal of sustainability and individual chronic level of construal on interest in sustainable information and apps (β = .90, p = .004 and β = -.15, p = .009 respectively). However, the two-way interaction was not significant (β = .008, n.s.).

Replacing the DV with interest in receiving sustainable information generated similar results. There was a positive main effect of construal of sustainability on level of interest in receiving information (β = .49, p = .008) and a negative main effect of individual chronic construal on interest in receiving information (β = -.10, p = .004). Nevertheless, the effects were not qualified by a significant interaction (β = .00, n.s.). Replacing the DV interest in downloading sustainable apps (i.e., removing information) generated a positive main effect of construal of sustainability on interest in downloading sustainable apps (β = .41, p = .007);

however, there was no main effect of individual chronic construal on interest in downloading sustainable apps (β = -.05, n.s.) and the effects were not qualified by a significant interaction (β = .01, n.s.). Results indicated that although measuring interest in sustainable information or apps appears to be an adequate measure for assessing the relationship between construal of sustainability and sustainable behavior, it does not fully capture the role of individual chronic level of construal. In addition, interest in receiving information or downloading an app is likely not an adequate measure of behavioral outcome (i.e., there is no control that the information or app is downloaded and used). Given that the following studies had to be conducted online rather than in the lab due to COVID-19, I decided not include this exploratory measure, but rather identified another validated measure that would better assess behavioral outcome in an online study design.

Psychological distance describes how proximal (distal) a construct is from the direct experience of 'here and now' (Trope & Liberman, 2010). According to CLT, construal is systematically influenced by psychological distance. Thus, I reran the same regression analysis with psychological distance as a covariate and it was significant (β = .25, p < .001). However, the interaction of individual chronic level of construal and sustainable behavior was no longer significant (β = -.01, n.s.). This was likely due to multicollinearity. The correlation between construal of sustainability and psychological distance was significant (r = .44, p <.05). Moreover, when psychological distance was included as the IV in lieu of construal of sustainability, although it generated a positive main effect on sustainable behaviors (β = .24, p < .01), it did not interact with individual chronic level of construal (β = -.05, p = n.s.). I decided not to include the measurement of psychological distance in subsequent studies, but rather focus on measuring construal of sustainability as a core determinant of concretization.

Knowledge of Sustainability

Awareness and knowledge about the CE are low in the U.S. compared to other sustainable concepts. Only 27.8% of respondents claimed to be aware of the CE. This compares to 97.5% for climate change, 77.4% for biodiversity, 94.0% for carbon footprint, and 47.1% for biomass. The mean score for knowledgeability of the CE was 1.67 (SD=1.11) which was significantly lower than for climate change, $t(481) = -40.72$, p < .001, biodiversity $t(481) = -20.21$, p < .001, carbon footprint $t(481) = 31.81$, p < .001, and biomass $t(481) = -6.48$, p <.001.

Correlations and descriptive statistics for Study 1 appear in Table 6. The full regression results appear in Table 7. Figure 4 visualizes the interaction between individual chronic construal on construal of sustainability and sustainable behavior.

Table 6

Correlations and Descriptive Statistics (Study 1)

	Mean (SD)	1	2	3	4	5	6	7	8
Sustainable Behavior (1)	3.34 (.66)	1	.28**	-.20**	.53**	.42**	.15**	.17**	.10*
Construal Sustainability (2)	4.27 (1.12)		1	-.24**	.35**	.44**	.15**	.14**	.13**
Chronic Construal (3)	10.79 (6.23)			1	-.22**	.11*	-.12*	-.13**	-.08
Attitude to Environment (4)	4.98 (1.12)				1	.62**	.43**	.42**	.36**
Psychological Distance (5)	5.15 (.96)					1	.33**	.33**	.27**
Sustainable Info & Apps (6)	13.18 (7.79)						1	.94**	.91**
Sustainable Info (7)	8.30 (4.54)							1	.70**
Sustainable Apps (8)	4.89 (3.80)								1

* Correlation is significant at the 0.01 level (2 tailed)

** Correlation is significant at the 0.05 level (2 tailed)

Table 7

Moderated Regression (Hayes PROCESS model 1) Results, Study 1

DV: Sustainable Behavior, IV Construal of Sustainability					
	Coefficient	SE	t	P	95% CI
Constant	2.99	0.14	21.36	<.001	[2.72, 3.27]
Construal Sustainability (CS)	.15	0.03	5.92	<.001	[.10, .20]
Chronic Construal (CC)	-.01	0.01	-2.39	.017	[-.02, -.00]
CS x CC	-.01	0.00	-2.03	.043	[-.02, .00]
Age	.01	0.00	3.76	<.001	[.00, .01]
Gender (M=0, F=1)	.25	0.06	4.58	<.001	[.14, .36]
Married/Partner	-.12	0.06	-1.95	.051	[-.23, .00]
Higher Education	.09	0.06	1.54	.125	[-.02, .20]
Conditional effects of Construal of Sustainability at Values of Chronic Construal					
Chronic Construal	Effect	SE	t	P	95% CI
-1 SD	.20	0.04	5.54	<.001	[.13, .28]
Average	.15	0.03	5.92	<.001	[.10, .20]
+1 SD	.10	0.04	2.81	.005	[.03, .17]

Figure 4

Interaction of Individual Chronic Construal on
Construal of Sustainability and Sustainable Behavior
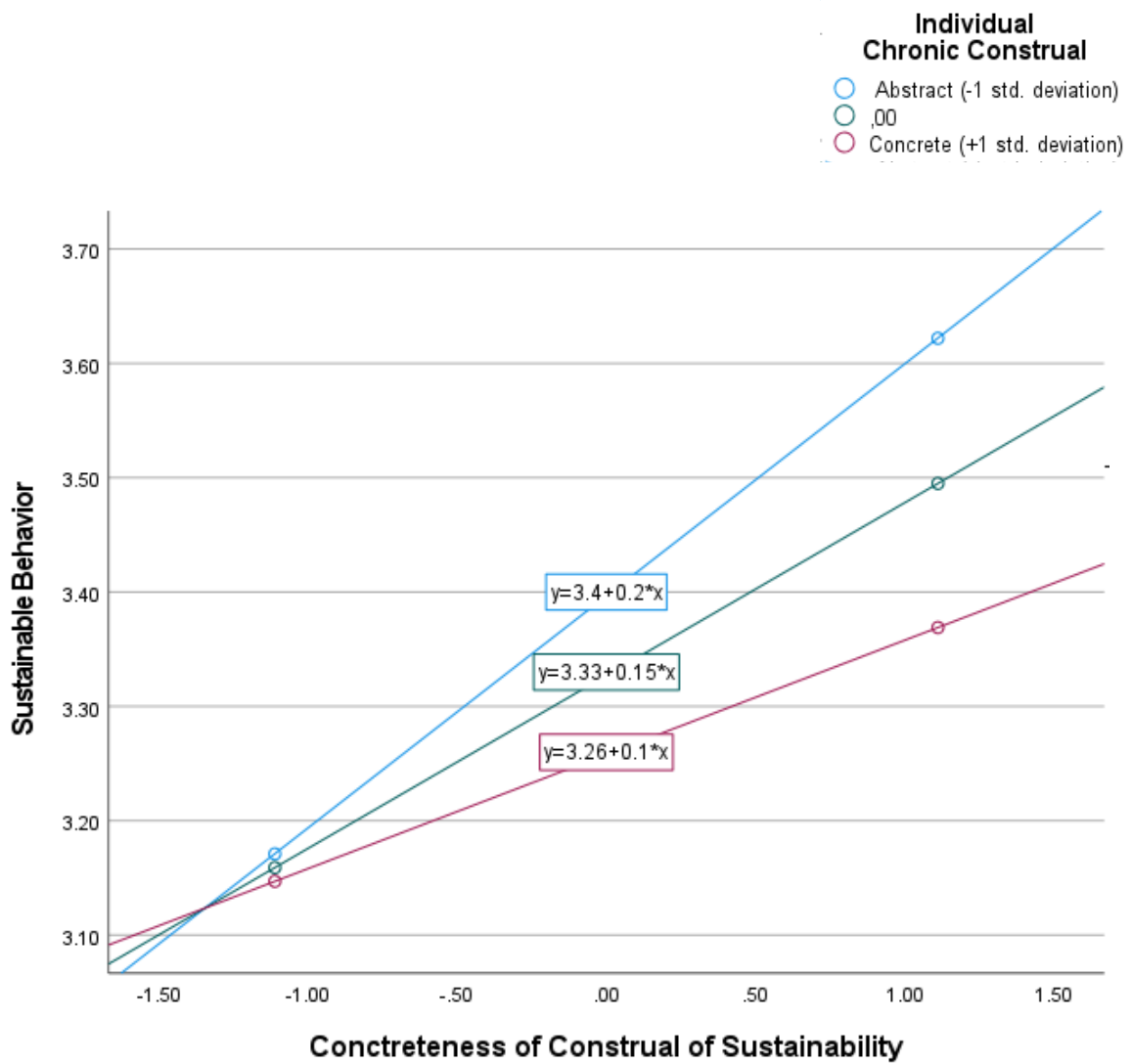
A high level of construal of sustainability is more concrete (low level more abstract)
A high level of sustainable behavior represents more engagement in sustainable behaviors

Summary

The objective of Study 1 was two-fold: to validate construct measurements and to test in a large national sample, whether more concrete construal of sustainability and more abstract individual chronic construal are related to more engagement in sustainable behaviors (H1 and H2 respectively) as well as the moderating role of individual chronic construal on the relationship between construal of sustainability and sustainable behavior (H4).

In terms of measurements, this first study provides empirical evidence that the Construct Construal Scale is a suitable measure for a substantive analysis of construal of sustainability, the core construct of this research; it was therefore employed in subsequent studies. Testing demonstrated that the scale adequately measures previously tested concrete constructs as concrete and abstract constructs as abstract: reliability testing showed good internal consistency ($\alpha = .86$). The implication is that finding ways to make the concept of sustainability more concrete can provide a positive impetus to individual participation in sustainable behavior. Although results from this study also suggest that making sustainability more psychologically proximal can also have a positive impact on sustainable behaviors, it provides little insight into the role of individual chronic level of construal, a factor of key interest in this research. Therefore, for reasons related to parsimony and focus, I decided not to include a psychological distance measure into subsequent studies. The measure of self-reported sustainable behavior worked well and also proceeded into studies 2 and 3. Downloading sustainable apps and information was not an adequate measure of behavioral change (limited additional value), and hence did not proceed in the research.

Study 1 also provided initial support for 2 of the tested hypotheses. Namely, as predicted, both more concrete construal of sustainability and more abstract individual chronic level of construal were positively related to engagement in sustainable behaviors (H1 and H2) and individual differences in chronic level of construal moderated the relationship between

construal of sustainability and sustainable behaviors for most people. More specifically, the relationship between construal of sustainability and sustainable behaviors is significant amongst less concrete individuals whose chronic levels of construal are equal or lower than 19.13 (accounting for 90.79% of respondents). The relationship is not significant for very concrete people (chronic level of construal above 19.13, representing 9.21% of respondents). This differs from H4, which predicted a stronger relationship between construal of sustainability and sustainable behaviors for more concrete people.

The biggest limitation of this study is the cross-sectional nature of the data set, so that no causal relationships can be established. Studies 2 and 3 employed a causal, experimental design to establish causality between framing sustainability as circularity and construal of sustainability and its downstream, behavioral outcomes.

Study 2

The objective of study 2 was to assess whether circular packaging claims can prompt more concrete construal of sustainable messaging and hence elicit more sustainable behavior compared to sustainable packaging claims, and whether the effects are moderated by individual chronic level of construal.

Study 2 Pre-Study

The goal of the pre-study for Study 2 was to validate the experimental manipulations for the main study. Two framing options were tested based on different forms of communication about a fictitious laundry detergent brand (Almat): circular versus sustainably framed package claim messaging and circular versus sustainably framed brand mission statement messaging. Appendix C includes these materials in more detail.

Methods

Participants

60 adults based in the U.S. were recruited via Prolific to participate in an online study for monetary compensation. 4 respondents who did not pass at least one of the two attention check questions were removed for data analysis purposes ($n = 56$). 37.50% of participants were female ($M = 35.16$ years old, $SD = 12.05$).

Procedure

The design utilized a within-subjects experiment that evaluated consumer responses to circular framed messaging versus sustainable messaging. More specifically, each participant saw packaging with circular framed claim messaging, the same packaging with sustainably framed claims messaging, a mission statement with circular framed claims messaging, and the same mission statement with sustainably framed claims messaging.

Participants were informed that the purpose of the research was to evaluate variations of marketing materials that describe different ways brands are helping to protect the environment. They were asked to consider the following definition when evaluating the claims: activities are circular when natural resources and materials are reused and recycled with the aim of achieving ZERO waste. Participants were sequentially shown two laundry detergent packages. The packages were identical except for two claims situated at the top of the package design. Based on the definition of circular claims, "100% Recyclable Packaging" and "100% Renewable Ingredients" were selected as circular framed messaging claims for one pack and "100% Eco-Friendly Packaging" and 100% Sustainable Ingredients" were selected as sustainably framed messaging claims for the other pack. This procedure was repeated for two mission statements (also from laundry detergent) which were identical except for the inclusion of sustainably or circular framed messaging. Again, based on the definition provided for circular claims, "keeping materials in circulation", "using renewable

ingredients", "using recycled materials", and "zero waste manufacturing processes" were selected as circular framed messaging to describe the company's activities to protect the environment. On the other hand, "reducing our carbon footprint", "using bio-based ingredients", "using eco-friendly materials", and "sustainable manufacturing processes" were selected as sustainably framed messaging to describe the company's activities to protect the environment The order of marketing materials was randomized.

Measurements

Respondents rated the extent to which the claims contained activities which were circular (5-point scale with anchors not at all circular to very circular), followed by a 3-item measure of attitude toward the overall packaging and mission statements (5-point scale with anchors dislike/like, unappealing/appealing, and terrible/excellent) (MacKenzie et al., 1986). The three attitudinal items were randomized ($\alpha = .90$). The survey concluded with six demographic items: gender, age, ethnicity/race, level of education, and marital/live-in partner status.

Analytical Approach

Using paired t-tests, mean circularity scores were compared for circular framed versus sustainably framed packaging claims and circular versus sustainably framed mission statements. Paired t-tests were employed to compare mean attitudes toward the packaging (mission statement) with circular claims versus the packaging (mission statement) with sustainable claims statements.

Study 2 Pre-Study's Results

Paired T-Tests

As anticipated, for the packaging the circular framed claims were perceived to be significantly more circular ($M = 4.21$, $SD = 1.00$) than the sustainably framed claims ($M = 3.63$, $SD = 1.23$), $t(55) = 4.17$, $p <. 001$. Moreover, attitudes towards packaging were not

significantly different for circular claims ($M = 3.46$, $SD = 0.82$) and sustainable claims ($M = 3.33$, $SD = 0.87$); $t(55) = 1.90$, n.s. For the mission statement, the circular framed claims were also perceived as more circular ($M = 4.48$, $SD = 0.18$) than the sustainably framed claims ($M = 4.13$, $SD = 0.18$); $t(55) = 2.26$, $p = .028$. However, there was also a significant difference in the attitude towards mission statements for circular claims ($M = 4.24$, $SD = 0.75$) and sustainable claims ($M = 3.88$, $SD = 0.80$), $t(55) = 3.00$, $p = .004$. Considering these results, the main study included only the packaging message claims, and not the mission statements. Results for Study 2 (the main study) are presented in the sub-sections that follow.

Study 2 Main Study

To assess the full model, I conducted an online experiment, employing a single factorial design with two between-subjects message conditions (circular framing and sustainable framing).

Methods

Participants

A sample of 278 adults, aged 25 to 45, who were the primary shoppers for their household and lived with a spouse or partner in the U.S. were recruited from the Prolific crowdsourcing platform to participate in an online study for monetary compensation. 33 respondents who did not pass at least one of the six attention check questions were removed for data analysis purposes. This resulted in a final sample of 245. 52.2% of participants were female ($M = 35.55$ years old, $SD = 5.32$).

Procedure

Participants were informed that the goal of the research was to assess people's perception of sustainability, sustainable messaging, and the associated effect on sustainable consumption behaviors. This study relied on two packaging claim messages, which were obtained from the pretest in a between-subjects design. Participants were randomly assigned

to view either the packaging with circular framed claims or the packaging with sustainably framed claims. Respondents completed the BIF (Vallacher & Wegner, 1989) from Study 1, the Construct Construal Scale, and a battery of items measuring their attitude towards the treatment. To measure willingness to pay for a sample of the product, participants completed the Becker-DeGroot-Marschak (BDM: Becker et al., 1964) incentive compatible task, followed by the GCVS from Study 1. The survey closed with nine demographic items.

Measurements

- Behavioral Identification Form (BIF)

The 25-item BIF (Vallacher & Wegner, 1989) captured individual chronic level of construal ($\alpha = .89$).

- Construct Construal Scale

Construal of circular/sustainable messaging was measured as a manipulation check using the 8-item Construct Construal Scale from Study 1 ($\alpha = .93$).

- Attitude toward the Packaging

Attitude towards the packaging was measured by a battery of five items on a 5-point Likert scale with the following anchors: dislike/like, unfavorable/favorable, undesirable/desirable, negative/positive, and terrible/excellent (Russell & Rasolofoarison, 2017) ($\alpha = .94$).

- Willingness to Pay

To credibly demonstrate the impact of an intervention, it is important that researchers look beyond the effects of intentions as individuals often fail to translate intentions into behaviors. Hulland and Houston (2021) suggest that one method to reduce the size of the behavior-intention gap is to include specific implementation intention measurements. I therefore included a Becker-DeGroot-Marschak (BDM: Becker et al., 1964) incentive compatible task to more accurately assess 'behavioral outcome', the DV of this model. BDM is an incentive-compatible procedure used in marketing and economics research to measure willingness to

pay for a product (Homburg et al., 2005; Wertenbroch & Skiera, 2002). Willingness to pay measures the value a person assigns to a consumption or usage experience in monetary units and reflects the person's interest in trying a product (Homburg et al., 2005). Participants were informed they had a 50% chance of being awarded a cash bonus at the end of the survey and could select whether to keep the money or use the money to purchase a five-wash sample of laundry detergent at various incremental levels of money. Participants first selected their preference for one of three types of laundry detergents: powder, liquid, or pods. For each incremental level of money (10 levels: $0.25 to $2.50 in 25 cent intervals), participants chose whether they would prefer to receive the money or the five-wash sample ($\alpha = .94$). They were informed that 50% of survey respondents would be randomly chosen at the end of the study to receive one of their selected choices. For example, if a respondent was chosen at the level of $1.00 and had opted to receive the laundry detergent sample, they were told they would receive the sample; if a respondent opted to receive cash, they were told they would receive a cash bonus of $1.00. After a practice exercise, participants made their selection for each of the 10 levels, indicating whether they wanted to receive the sample or cash.

- Green Consumption Values Scale (GCVS)

Participants attitude toward the environment was measured using the GCVS from Study 1. Cronbach's alpha for this scale was .93.

- Demographics

9 demographic items were captured including gender, age, race/ethnicity, employment status, level of education, marital/live-in partner status, number of children, size of household, and annual income.

Analytical Approach

To ensure internal validity, mean attitudes toward the packaging with sustainably framed claims versus the packaging with circular framed claims were compared. The main

model was then tested in a moderated mediation regression analysis using PROCESS by Andrew Hayes Model 7 to assess the causal relationships between framing sustainability as circularity, construal of sustainability, and engagement in sustainable behaviors, as well as the moderating effect of individual chronic construal. More specifically, I assessed whether framing sustainability as circularity makes construal of sustainable messaging more concrete (H3) and whether this, in turn, increases willingness to pay for a sustainable product (H1). I also measured whether the indirect effect of circular framing on sustainable behavior varies as a function of individual chronic construal, whereby individual construal moderates the relationship between construal of sustainability and sustainable behaviors (H4) and circular framing and construal of sustainability (H5). Circular framing was entered as the predictor variable, chronic level of construal was entered as the moderator of circular framing to construal of sustainability and construal of sustainability to sustainable behavior relationships, construal of sustainability was the mediator, and sustainable behavior (level of donation or intention to engage in sustainable behaviors) was the outcome variable. All continuous variables were mean centered. The same model was run including attitude toward the environment and age as covariates and generated the same results. For parsimony, the main analyses in Chapter 4 are presented without covariates. To further probe the interaction, I explored the interaction effect of individual chronic level of construal on the relationship between circular framing and construal of sustainability using the Johnson-Neyman floodlight approach.

Study 2's Results

The objective of Study 2 was to assess the relationship between construal of sustainability and sustainable behavior (H1), the effect of an intervention to frame sustainable messaging as circularity on construal of sustainability (H3) as well the moderating role of individual chronic level of construal on the relationship between construal of sustainability and

sustainable behaviors (H4) and on the relationship between circular framing and construal of sustainability (H5).

Attitude towards the Treatments

As expected, there was no significant difference between attitudes towards packaging with sustainably framed claims ($M = 3.44$, $SD = 0.70$) versus packaging with circular framed claims ($M = 3.49$, $SD = 0.67$); $t(243) = .67$, n.s.).

Causal Relationships

Regression analysis showed that circular framing does not directly affect construal of sustainability ($\beta = .23$, n.s.) but significantly interacts with individual chronic level of construal as predicted per H5 ($\beta = .06$, $p = .027$). Moreover, there was a negative main effect of individual chronic level of construal on construal of sustainability ($\beta = -.08$, $p < .001$), although this was not formally predicted. Further regression analysis suggested the effect of circular framing on purchase price is mediated through construal of sustainability. For concrete individuals, circular framing of sustainability prompted willingness to pay a higher price, although there was no significant effect for more abstract individuals. More specifically, for concrete individuals (+1 SD), circular framing of sustainable messaging prompted more concrete message interpretation ($\beta = .63$, $p = .013$). Amongst more abstract individuals (-1 SD), there was no difference in construal of sustainability, both circular and sustainable packaging were perceived as equally concrete ($\beta = -.16$, n.s.). A Johnson-Neyman floodlight analysis indicated for concrete individuals with a BIF score of 14.69 and above (36.74% of the sample), circular framing makes sustainable messaging more concrete.

Results suggested that circular message framing had a significant effect for more concrete individuals. Not only did it prompt more concrete message interpretation, but also a willingness to pay a higher price. For abstract individuals, who already tend to behave sustainably, there was no significant effect. Per H1, there was a significant effect of

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construal of sustainability on willingness to pay ($\beta = .14$, $p < .01$). As predicted, circular

framing did not have a main effect on willingness to pay ($\beta eta = -.05$, n.s.); instead, the effect

of circular framing on purchase price is mediated through construal of sustainability,

supported by an index of moderated mediation $= .01$ (95% $CI = .00, .02$) for concrete

individuals ($\beta = .09$, 95% $CI = .02, .17$). There was no significant effect for more abstract

individuals ($\beta = -.02$, 95% $CI = -.11, .05$). Table 8 summarizes the results and the effects are

visualized in Figure 5.

Table 8

Moderated Mediation (Hayes PROCESS Model 7) Regression Results, Study 2

DV: Construal of Sustainability // IV: Circular Framing (Treatment)					
	Coefficient	SE	t	p	95% CI
Constant	3.38	0.13	27.12	<.001	[3.13, 3.63]
Circular Framing (CF)	.23	0.18	1.32	.189	[-.12 .58]
Chronic Construal (CC)	-.08	0.02	-4.04	<.001	[-.12, -.04]
CF x CC	.06	0.03	2.22	.027	[.01, .12]

Conditional effects of Circular Framing on Construal of Sustainability at values of Chronic Construal					
Chronic Construal	Effect	SE	t	p	95% CI
-6.300 (-1 SD)	-.16	0.25	-.64	.522	[-.65, .33]
.000	.23	0.18	1.32	.189	[-.12, .58]
6,300 (+1 SD)	.63	0.25	2.51	.013	[.13, 1.12]

DV: Sustainable Behavior (WTP) // IV: Circular Framing (Treatment) Mediator: Construal of Sustainability					
	Coefficient	SE	t	p	95% CI
Constant	.38	0.11	3.37	<.001	[.16, .60]
Circular Framing (CF)	-.05	0.08	-.65	.518	[-.21, .11]
Construal of Sustainability (CS)	.14	0.03	4.79	<.001	[.08, .19]

Conditional indirect effects of Construal of Sustainability on Sustainable Behaviors at values of Chronic Construal					
Chronic Construal	Effect	SE		P	95% CI
-6.30 (-1 SD)	-.02	0.04		ns	[-.11, .05]
.000	.31	0.02		ns	[-.02, .08]
6.30 (+1 SD)	.09	0.04		s	[.02, .17]

Figure 5

Effect of Sustainable versus Circular Framing on
Construal of Sustainable Messaging
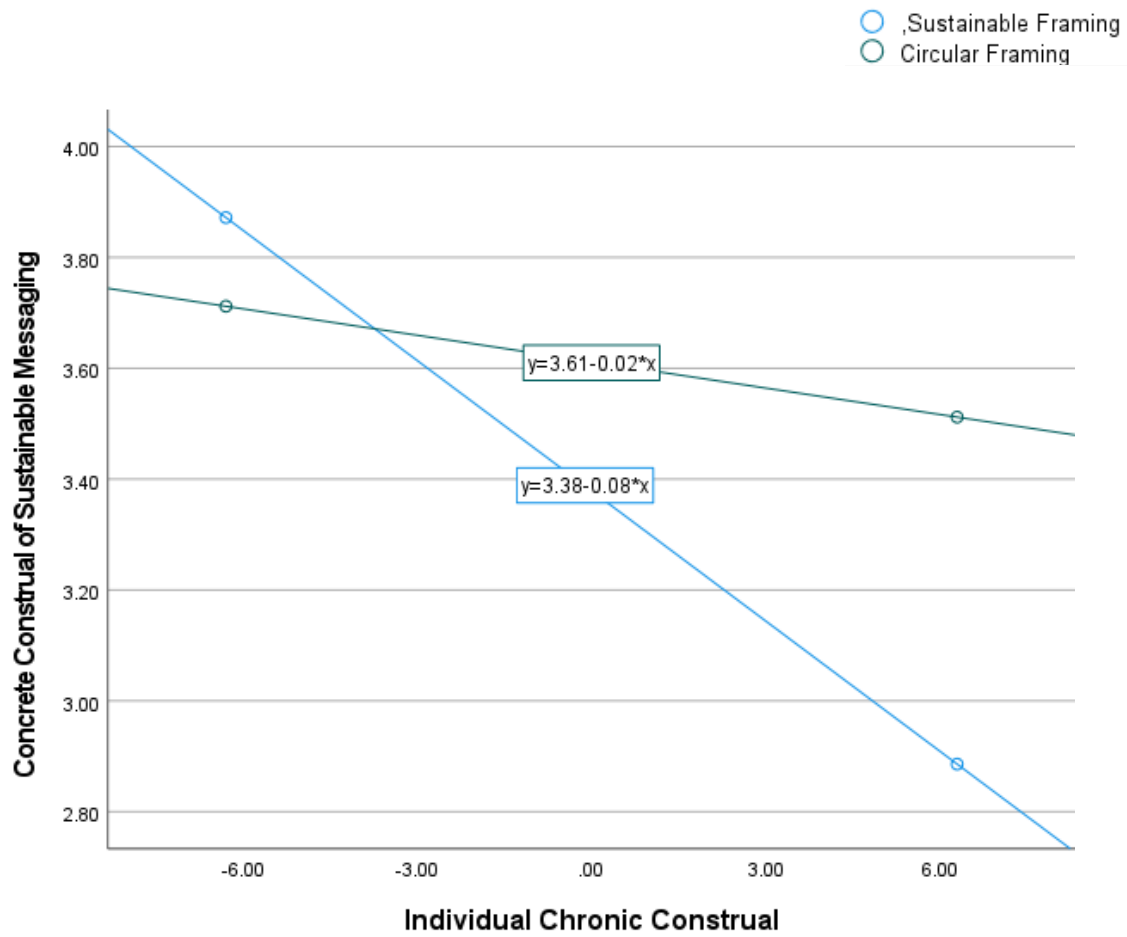
A high level of individual construal is more concrete (low level more abstract)
A high level of construal of sustainability is more concrete (low level more abstract)

Summary

Past research suggests that more concrete individuals tend not to engage in sustainable behaviors. Results from Study 2 provide further evidence that concretizing consumers' understanding of sustainable messaging with circular framed messaging can motivate greater sustainable behavior, at least for concrete individuals. For abstract individuals, both packaging claims were perceived as equally concrete, but for concrete individuals only the circular framed condition was perceived as concrete. As such, although there was no overall main effect of circular framing on construal of sustainable messaging (H3), this study demonstrated that for more concrete individuals, implementation of circular message framing on laundry detergent packaging does lead to more concrete interpretation of sustainable messaging (H5).

Moreover, a more concrete sustainable message interpretation led to willingness to pay a higher price for the product (H1), and the effect was more pronounced for more concrete people (H4). This study also generated two additional findings, which were not directly predicted: more concrete people perceive sustainable messaging as abstract and, for concrete people, the effect of circular framing on willingness to pay a higher price is mediated through construal of sustainability. Although not formally predicted, the latter inherently represents the array of hypotheses H1-H5. One limitation of this study is that, despite significant differences in their mean scores for level of circularity, the sustainably framed claims and circular framed claims both tested relatively high in terms of level of circularity ($M = 4.21$ and $M = 3.63$ respectively). As Study 4 will show, the mean scores of sustainably framed claims "eco-friendly" and "environmentally friendly" scored within the top half of a total of 18 tested claims in terms of circularity. Study 3, also experimental in design, was devised to provide further evidence of causality of these relationships, employing a more extensive intervention of a short training about circularity.

Study 3

Moving beyond the simple message framing manipulation of Study 2, the objective of Study 3 was to assess whether a short educational video that frames sustainability as circularity can affect construal of sustainability and engagement in sustainable behavior compared to a control group. I conducted a longitudinal online experiment, employing a single factorial design with two between-subjects conditions (circular framing and control group). In addition to measuring the effect of an intervention (educational video) which frames sustainability as circularity (H3) and the moderating role of individual chronic level of construal (H5), the experiment also assessed the effects of construal of sustainability on sustainable behavior (H1), the effect of individual chronic construal on sustainable behavior (H2), and its moderating role on the relationship between construal of sustainability and sustainable behavior (H4). The study captured both immediate and lagged effects, with measures collected immediately (Wave 1) and one week after the intervention (Wave 2).

Study 3 Pre-Study

The objective of the pre-study was to validate the experimental manipulations and measurements for the main study.

Methods

Participants

100 adults, aged 25 to 45, living with a spouse or partner in the U.S. who are the primary shoppers for the household were recruited via Prolific for monetary compensation. 22 respondents who did not pass at least one of the nine attention check questions were removed for data analysis purposes, resulting in a final sample size of 78. 69.2% of participants were female ($M = 34.38$ years old, $SD = 5.99$).

Procedure

The pre-study followed the same between-subjects design as the main study. Participants were informed that the purpose of the research was to assess people's perception of sustainability, sustainable messaging, and the associated effect on sustainable consumption behaviors. They were randomly assigned to the treatment group or control group. Participants in the treatment group watched a short (six minutes), self-produced, educational video which framed sustainability as circularity. The video used an offline speaker and animated presentation style. For the control group, participants viewed an animated video of similar length (five minutes) on why some people are left-handed (TED Talk). To prevent bias, the speaker and music were changed to be identical to the control video and all references to 'TED Talk' were removed. See Appendix C for video storyboards.

After viewing the video, the same set of measures was collected in both conditions. To check that they had watched the video, participants answered three questions about the format and content of the video, a battery of five items regarding their attitude towards the video, and a 5-item filler task regarding overall habits and preferences for online video viewing. Construal of sustainability was measured using the Construct Construal scale from earlier studies ($\alpha = .90$). A BDM incentive compatible task was employed to measure willingness to donate to a sustainable charity. Participants' intentions to behave sustainably was then measured using the Sustainable Behavior Scale. The survey closed with demographic items.

Attention Checks

Given the length and online nature of the study, a conservative approach was taken with regards to attention checks to ensure that only quality responses were used in the main analyses. Attention check items throughout the study included three post-video questions related to the content of the video (e.g., gender of the speaker, type of visuals, and

predominant images), four traditional attention check items (e.g., please select somewhat disagree), and two practice questions for the BDM incentive compatible task measure (Becker et al., 1964).

Attitude toward the Video

A battery of five items was used to measure attitude towards the video. I utilized a 5-point semantic differential scale anchored by dislike/like, unfavorable/favorable, uninteresting /interesting, not informative/informative, and not credible/credible (Russell et al., 2019) (α = .89). I also asked an open-ended question: "Do you have any recommendations to improve the video?"

Willingness to Donate to a Sustainable Charity

The BDM incentive compatible task in the previous study measured willingness to pay. In this study, I replaced willingness to pay for a product with willingness to donate to a charity that supports sustainable initiatives. Participants were informed they had a 50% chance of being awarded a cash bonus at the end of the survey and could select whether to keep or donate the bonus to a charity that supports sustainable initiatives at various incremental levels of money. Respondents first selected their preference for one of three charities that supports sustainable initiatives within the community: Ocean Cleanup which helps rid the ocean of plastic and trash, Tree People which plants trees within the community, and National Recycling Coalition which supports community recycling initiatives. For each incremental level of money (10 levels: $0.20 to $2.20 in 20 cent increments, $.60 was mistakenly omitted), participants chose whether they would prefer to receive or donate the money to their selected sustainable charity. After a practice exercise, participants made their selection for each of the 10 levels, indicating whether they would donate or receive cash.

Sustainable Behavior and Demographics

Finally, participants' intentions to behave sustainably were measured using the seven items from the Sustainable Behavior Scale. The questions were adapted to measure intended frequency to engage in sustainable behaviors during the near future instead of in the present. Cronbach's alpha for this 7-item scale was adequate (α = .66). The scale's reliability would have increased if one item (i.e., in the near future, how often will you separate your household garbage (i.e. glass, papers) for either curbside pick-up or take to the nearest recycling center) was removed (α = .74); however, the 7-item measure was preserved to maintain consistency with Study 1. 6 demographic items were captured including gender, age, ethnicity, level of education, and marital/live-in partner status.

Analytical Approach

Independent sample t-tests were conducted to ensure that there was no significant differences in attitudes toward the treatment and control video and a significant difference in mean construal of sustainability for the treatment video versus the control video.

Pre-Study's Results

There was no significant difference in attitude scores between the treatment (M = 3.68, SD = 0.78) and the control groups (M = 3.99, SD=.70), $t(76)$ = -1.85, n.s. Furthermore, a manipulation check indicated that the video was successful, as there was a significant difference in mean construal of sustainability for participants who viewed the treatment video (M = 4.72, SD = 1.17) versus those who viewed the control video (M = 4.17, SD = 1.11), $t(76)$ = -2.12, $p <$. 001. As predicted by H3, participants who viewed the educational video that framed sustainability as circularity had a more concrete interpretation of sustainability than participants who viewed the control video. This main effect emerged even without accounting for the eventual moderating effect of individual chronic level of construal, which was not included in this pretest. Another goal of this pre-test was to assess participants

understanding of the BDM donation task. 14 of 100 participants failed one of the two practice items for the BDM donation task and two also failed at least one other attention check question in the survey. An additional six participants answered the donation task internally inconsistent (e.g., skipping back and forth between donation and receiving money). Based on the pretest results, I proceeded with both videos as well as the BDM donation task measure (including two practice items as attention checks) to the main study.

Study 3 Main Study

Method

Participants

A sample of 386 adults, aged 25 to 45, who are the primary shoppers for the household and live with a spouse or partner in the U.S. were recruited from the Prolific crowdsourcing platform to participate in an online study for monetary compensation. The study progressed in two waves. For Wave 1, 89 participants were terminated after failing at least one of three attention checks based on their viewing of the video. 51 respondents who did not pass at least one of the other five attention check questions were also removed for data analysis purposes. This resulted in a final sample size of 246. 47.6% of participants were female ($M = 34.56$ years old, $SD = 5.24$). 20 responses of donation levels which were internally inconsistent (e.g., skipping back and forth between donation and receiving money) were removed and treated as missing values. Including these missing values did not change the results. For Wave 2, 90.6% of participants from Wave 1 responded to the second survey ($n = 223$). All respondents passed three attention checks. 43.9% of participants were female ($M = 34.70$ years old, $SD = 5.27$).

Procedure

The main study relied on the same between-subjects experimental design as the pre-study with two video conditions, capturing both immediate (Wave 1, after the intervention)

and lagged (Wave 2, one week after the intervention) effects. Participants were informed that the purpose of the research was to evaluate people's perceptions of messaging and the associated effects on behavior. To capture individual chronic level of construal, the proposed moderator in the model, respondents first completed the 25-item BIF (Vallacher & Wegner, 1989) ($\alpha = .89$). Participants, who were randomly selected to either the treatment or control group, viewed the same treatment and control videos and answered the same set of measures as in the pre-study. As in the pretest, a conservative attention check process was employed. One week after completing the survey for Wave 1, all 246 participants who completed Wave 1 were invited via Prolific to take part in a follow-up study. Construal of sustainability was assessed using the 8-item Construct Construal scale ($\alpha = .89$) from wave 1, followed by the 7-item Sustainable Behavior Scale which was adapted to capture frequency of engagement in sustainable behaviors during the week following wave 1 (e.g., during the past week, how often did you conserve water while washing dishes) ($\alpha = .71$). The study closed with two demographic items (gender and age).

Analytical Approach

To check the manipulations, mean construal of sustainability was compared between conditions with an independent samples t-test. For Wave 1, a regression analysis using PROCESS by Andrew Hayes Model 58 was conducted to test the full model, employing a moderated mediation analysis testing the causal relationships between framing sustainability as circularity, construal of sustainability, engagement in sustainable behaviors, and the moderating effect of individual chronic construal. More specifically, I assessed whether framing sustainability as circularity affects construal of sustainability (H3), which, in turn, has a direct effect on sustainable behavior (H1) (i.e., the indirect effect of circular framing on sustainable behaviors, mediated through construal of sustainability). I also measured whether the indirect effect of circular framing on sustainable behavior varies as a function of

individual chronic construal, whereby individual construal moderates the relationship between construal of sustainability and sustainable behaviors (H4) and circular framing and construal of sustainability (H5) as well as has a direct effect on sustainable behavior (H2). Circular framing was entered as the IV, chronic level of construal was entered as the moderator of circular framing to construal of sustainability and construal of sustainability to sustainable behavior relationships, construal of sustainability was the mediator, and sustainable behavior (level of donation or intention to engage in sustainable behaviors) was the DV. All continuous variables were mean centered. To further assess the mediation role of construal of sustainability between circular framing and sustainable behaviors as revealed in study 2, I also conducted a regression analysis using PROCESS by Andrew Hayes Model 4. Circular framing was entered as the predictor variable; construal of sustainability was entered as the mediator of circular framing to sustainable behavior relationship and sustainable behavior (level of donation to a charity that supports sustainable initiatives or intention to engage in sustainable behaviors) was the outcome variable. All continuous variables were mean centered.

For Wave 2, a regression analysis using PROCESS by Andrew Hayes Model 92 was conducted to test the relationship between circular framing and sustainable behavior through sequential mediation of construal of sustainability and sustainable behavior intentions and the moderating role of chronic construal on all pathways. Circular framing was entered as the IV, chronic level of construal was entered as the moderator of construal of sustainability to sustainable behavior intentions, circular framing to construal of sustainability, sustainable intentions to sustainable behavior, and circular framing to sustainable behavior (not predicted) relationships. Construal of sustainability and intention to engage in sustainable behavior from Wave 1 were the sequential mediators and sustainable behavior during the past week (Wave 2) was the DV. All continuous variables were mean centered.

Study 3's Results

The objective of the study was to assess whether an educational video which frames sustainability as circularity can concretize sustainability (H3) and ultimately impact sustainable behavior (H1) both immediately and one week after an intervention. The study assessed the role of individual chronic level of construal, its effect on sustainable behavior (H2), and its moderating role on the relationship between circular framing and construal of sustainability (H5) and between construal of sustainability and sustainable behavior (H4).

Wave 1 Manipulation Check

As expected, mean construal of sustainability was significantly higher for those in the treatment group (M = 4.94, SD = 1.09) than for those in the control group (M = 4.35, SD = 1.19, $t(244)$ = 4.00, $p < .001$). Attitudes toward the treatment and control videos were also compared and, unlike in the pretest where the difference was not significant, there was a significant difference with the control video (M = 4.15, SD = 0.69) generating a more positive attitude than the manipulation video (M = 3.88, SD = 0.79), $t(244)$ = -2.89, p = .004). This is not surprising given that the treatment video was self-produced, and the control video was professionally developed by TED. Because the pattern is opposite than the main manipulation, construal of sustainability, this difference in overall attitudes toward the video was not deemed to be an issue that could bias the results.

Wave 1 Main Effects

As per H1, there was a significant effect of construal of sustainability on donations to a sustainable charity (β = .10, p = .023). However, contrary to H2, there was no main effect of individual chronic level of construal on donations to a sustainable charity (β = .00, n.s.). There was also no significant interaction (H4), that is individual chronic level of construal did not moderate the relationship between construal of sustainability and engagement in sustainable behaviors (βeta = .00, n.s.). There was a significant main effect of circular

framing on construal of sustainability (β = .60, p <. 001) (H3), yet no interaction effect of chronic construal on the relationship between the circular framing intervention and construal of sustainability (β = .01, n.s.) (H5). Results indicated that the main effect of the circular framing intervention on construal of sustainability was significant regardless of participants' chronic level of construal. Moreover, regression mediation analysis demonstrated that, in line with H1 and H3, there was full mediation through construal of sustainability on the indirect effect of framing sustainability on sustainable behaviors (β = .06, p < .05).

The same pattern emerged with regards to intention to engage in sustainable behavior. The circular framing intervention had a significant effect on construal of sustainability (β = .58, p < .001) (H3) and, per H1, construal of sustainability was significantly related to intention to engage in sustainable behavior (β = .16, p < .001). However, contrary to H2, there was no main effect of individual chronic level of construal on sustainable behavior (βeta = .00, n.s.) and individual chronic level of construal did not moderate the relationship between circular framing and construal of sustainability (β = .01, n.s.) (H5) nor between construal of sustainability and intention to engage in sustainable behaviors (β = -.00, n.s.) (H4). As with donations to a charity that supports sustainable initiatives, regression mediation analysis demonstrated full mediation through construal of sustainability of the indirect effect of framing sustainability on sustainable behaviors with (β = .01, p < .05).

Results Wave 1 and Wave 2

Overall, the results from regression analysis replicated and extended the main findings from Wave 1. From Wave 1, the video that framed sustainability as circularity prompted a more concrete interpretation of sustainability, which in turn elicited higher intentions to engage in sustainable behaviors at all individual chronic levels of construal (abstract to concrete).The circular framing intervention had a significant effect on construal of sustainability (β = .72, p < .001) per H3 and in turn, per H1, construal of sustainability was

significantly related to intention to engage in sustainable behavior ($\beta = .16$, $p < .001$). However, contrary to H2 and H4, there was no main effect of individual chronic level of construal on sustainable behavior intentions ($\beta = -.07$, n.s.) and individual chronic level of construal did not moderate the relationship between circular framing and construal of sustainability ($\beta = .02$, n.s.) (H5) nor that between construal of sustainability and intention to engage in sustainable behaviors ($\beta = .01$, n.s.). For Wave 2, there was no significant main effect of construal of sustainability on sustainable behaviors (wave 2) ($\beta = .01$, n.s.) (H1). Sustainable behavior intentions from Wave 1 had a significant main effect on sustainable behaviors in Wave 2 ($\beta = .85$, $p < .001$), which was not predicted. There was no moderation effect of individual chronic construal individual construal on any pathway. A test of mediation revealed an indirect effect of circular framing (Wave 1) on sustainable behaviors (Wave 2) fully mediated sequentially through construal of sustainability and sustainable behavior intentions from Wave 1. Table 9, Table 10, Table 11, Table 12, and Table 13 highlight results from Study 3.

Table 9

Moderated Mediation Regression (Hayes PROCESS Model 58) Results, Study 3 - Wave 1

DV: Construal of Sustainability // IV: Circular Framing (Treatment)					
	Coefficient	SE	t	p	95% CI
Constant	-.28	0.11	-2.62	.009	[-.48, -.07]
Circular Framing (CF)	.60	0.15	3.87	<.001	[.292, .90]
Chronic Construal (CC)	-.02	0.02	-1.23	.222	[-.05, .01]
CF x CC	.01	0.02	.49	.623	[-.04, .06]

DV: Sustainable Behavior (Donation) IV: Circular Framing (Treatment) // IV: Construal of Sustainability					
	Coefficient	SE	t	p	95% CI
Constant	.77	0.07	11.32	<.001	[.65, .92]
Circular Framing (CF)	-.04	0.10	-.34	.731	[-.24, .17]
Construal of sustainability (CS)	.10	0.04	2.29	.023	[.01, .19]
Chronic Construal (CC)	.00	0.01	-.11	.913	[-.02, .02]
CS x CC	.00	0.00	.078	.938	[-.01, .01]

Table 10

Mediation Regression (Hayes PROCESS Model 58) Results (Study 3)

Indirect Effect of Circular Framing on Sustainable Behavior (Donation)				
	Effect	SE	p	95% CI
Construal of Sustainability	.06	0.03	<.05	[.01, .12]

Table 11

2nd Moderated Mediation Regression Results, Study 3 - Wave 1

DV: Construal of Sustainability // IV: Circular Framing (Treatment)					
	Coefficient	SE	t	p	95% CI
Constant	-.26	0.10	-2.64	.009	[-.46, -.07]
Circular Framing (CF)	.58	0.15	3.95	<.001	[.29, .88]
Chronic Construal (CC)	-.02	0.02	-.10	.321	[-.05, .02]
CF x CC	.01	0.02	.27	.785	[-.04, .05]

DV: Sustainable Behavior (Intentions) IV: Circular Framing (Treatment) // IV: Construal of Sustainability					
	Coefficient	SE	t	p	95% CI
Constant	3.80	0.05	69.73	<.001	[3.69, 3.90]
Circular Framing (CF)	-.07	0.08	-.79	.431	[-.23, .10]
Construal of sustainability (CS)	.16	0.04	4.63	<.001	[.09, .23]
Chronic Construal (CC)	.00	0.01	-.63	.530	[-.02, .01]
CS x CC	.00	0.01	-.28	.777	[-.01, .01]

Table 12

2nd Mediation Regression (Hayes PROCESS Model 4) Results (Study 3)

Indirect effect of Circular Framing on Sustainable Behavior Intention				
	Effect	SE	p	95% CI
Construal of Sustainability (CS)	.01	0.03	<.05	[.04, .17]

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Table 13

*Moderated Sequential Mediation Regression Results, Study 3 – Both Waves*

DV: Sustainable Behavior Intentions (Wave 1) IV: Circular Framing (Video from Wave 1)					
	Coefficient	SE	t	p	95% CI
Constant	.03	0.06	.53	.596	[-.08, .14]
Circular Framing (CF)	-.06	0.09	-.71	.475	[-.24, .11]
Const. of Sust Wave 1 (CS1)	.16	0.04	4.20	<.001	[.08, .23]
Chronic Construal (CC)	-.07	0.01	-.77	.445	[-.03, .01]
CF x CC	.01	0.01	.80	.426	[-.02, .04]
CS1 X CC	.00	0.01	.12	.92	[-.01, .01]

DV: Sustainable Behavior (Past Week, Wave 2) IV: Circular Framing (Video from Wave 1)					
	Coefficient	SE	t	p	95% CI
Constant	3.57	0.04	80.92	<.001	[3.48, 3.65]
Circular Framing (CF)	.04	0.07	.61	.542	[-.09, .17]
Const of Sust. Wave 1 (CS1)	.01	0.03	.47	.636	[-.04, .08]
Intentions Sustainable Behavior Wave 1 (SB1)	.85	0.05	16.40	<.001	[.76, .96]
Chronic Construal (CC)	-.01	0.01	-.14	.150	[-.01, .01]
CF x CC	.02	0.01	1.42	.157	[-.03, .01]
CS1 X CC	.00	0.01	-.66	.510	[-.01, .01]
SB1 X CC	.01	0.01	-1.21	.229	[-.03, .01]

Indirect Effect CF-CS1-SB1-SB2				
Chronic Construal	Effect	SE	p	95% CI
-1 SD	.076	0.04	<.05	[.01, .16]
Average	.097	0.03	<.05	[.04, .17]
+1 SD	.121	0.05	<.05	[.03, .24]

Summary

The objective of Study 3 was to assess whether a short educational video that frames sustainability as circularity can prompt more concrete construal of sustainability, leading to more sustainable behavior compared to a control group. The study also assessed if the effects were moderated by individual chronic level of construal. Overall, results from Wave 1 showed that a short educational video that framed sustainability as circularity using a short educational video did result in a more concrete interpretation of sustainability (H3) and this more concrete interpretation of sustainability prompted both intentions to engage in sustainable behaviors as well as a higher level of donations to charities that support sustainable initiatives (H1). Contrary to H4 and H5, these effects were the same regardless of individuals' chronic level of construal. Contrary to H2, there was no main effect of individual chronic level of construal on sustainable behavior. Wave 2 results indicated that not only does framing sustainability as circularity using a short educational video result in a more concrete interpretation of sustainability, it also prompted higher intentions to engage in sustainable behaviors (H3), which in turn led to more engagement in sustainable behaviors one week after the intervention (H1). Again, contrary to H4 and H5, the effects were the same regardless of an individual's chronic level of construal. One finding was not predicted in the model but fully aligned with the predictions; the effect of an educational video that frames sustainability as circularity on engagement in sustainable behaviors one week after the intervention was fully mediated sequentially through construal of sustainability and sustainable behavior intentions. Figure 6 summarizes the findings.

Figure 6

Unexpected Mediation Model for Study 3
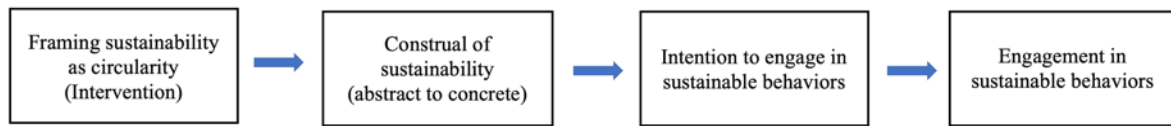
Study 4

A final study was developed to provide external validity by assessing consumers perceptions of sustainable marketing claims currently used on household products. The study's goal was to assess the relationship between a marketing claim's perceived circularity and concreteness of sustainable message construal as well as the moderating role of individual chronic level of construal in this relationship.

Study 4 Pre-Study

The purpose of the pre-test was to select a set of existing marketing claims with a maximal variance in level of circularity for placement in the main study. Table 14 shows a list of all claims tested in the pre-study.

Table 14

Sustainable Marketing Claims Tested (Pre-Study 4)

Product	Ingredients	Manufacturing	Packaging
Eco friendly	Compostable	Reduced carbon footprint	Recyclable
Green	Biodegradable	Made with renewable energy	From recycled materials
Environmentally friendly	Renewable	Zero waste to landfill	Refillable
Sustainable	Plant based	Ozone friendly	Reusable
Non toxic	Biobased	Carbon neutral	No plastic
Natural	Phosphate free	Less CO_2 emissions	0% plastic

Methods

Participants

60 adults based in the U.S. were recruited via Prolific for monetary compensation to participate in a study. 1 respondent who did not pass at least one of the two attention check questions was removed for data analysis purposes, resulting in a sample size of 59. 47.5% of participants were female (M = 29.86 years old, SD = 10.62).

Procedures

Participants were informed that the purpose of the research was to evaluate variations of sustainable marketing claims which describe different ways in which household product companies are helping to protect the environment. The study relied on a within-subjects design to assess 24 different sustainable marketing claims used for household products, the order of which was randomized. Participants rated the extent to which each sustainable marketing claim encompasses activities which are circular, taking into consideration the following definition: circular activities aim to eliminate waste by reusing or recycling resources and materials. Claims were presented in four blocks of questions, each containing six sustainable claims for evaluation. The four blocks included: overall product

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claims, ingredient claims, manufacturing process claims, and packaging claims. Claims for testing were selected from the 11 sustainable marketing claim categories of the Federal Trade Commission Green Guide: general environmental benefit, carbon offsets, compostable, degradable, toxicity, ozone, recycling, refillable, renewable, free form, and source reduction. 7 additional claims used by the 20-top selling product launches in the U.S. from March 2020 to March 2021 with ethical-sustainable claims in the categories of household care (Mintel Global New Products Database) were added: natural, biobased, plant based, zero waste to landfill, ozone friendly, 0% plastic. The survey closed with two demographic questions: age and gender.

Pre-Study Results

Mean circularity scores were computed for each claim and the claims were sorted by level of circularity. Using a median split methodology and paired t-tests, mean circularity scores were computed for the 12 most circular claims (high circular claims) versus the 12 least circular claims (low circularity claims). Results confirmed that the claims intended to be highly circular were perceived as significantly more circular ($M = 4.28$; $SD = 0.53$) than those intended to be low circular claims ($M = 3.17$; $SD = 0.94$; $t(58) = 9.54$, p = .010). In addition, each high circular claim was perceived as significantly more circular than each low circular claim. Based on these results and with the objective of maximizing variance of claim circularity for testing, I proceeded with the nine most circular and the nine least circular claims into the main study. The claim no plastic was dropped due to its similarity to 0% plastic claim. Table 15 shows the mean and standard deviations for each of the sustainable claims used in the Pre-Study.

Table 15

Sustainable Marketing Claims Level of Circularity (Pre-Study 4)

Sustainable Claims	Mean	SD
High Circularity		
Reusable	4.58	0.700
Recycled materials	4.47	0.796
Recyclable	4.39	0.965
Zero waste to landfill	4.32	0.918
Refillable	4.31	0.915
Renewable	4.22	0.966
Sustainable	4.15	0.887
Compostable	4.12	1.019
Eco-friendly	3.93	1.032
Biodegradable	3.93	1.298
Environmentally friendly	3.80	0.996
Made with renewable energy	3.69	1.303
Low Circularity		
Green	3.61	1.260
Reduced carbon footprint	3.49	1.223
Biobased	3.44	1.236
Plant based	3.44	1.178
Carbon neutral	3.27	1.157
Ozone friendly	3.25	1.294
No plastic	3.14	1.293
Natural	3.12	1.427
Less Co2 emissions	3.08	1.250
Non toxic	3.07	1.311
0% plastic	3.05	1.279
Phosphate free	2.78	1.175

Study 4 Main Study

The main study evaluated whether circular framed marketing messages are more concrete than sustainably framed marketing messages (H3), and whether the relationship between circular framing and concreteness of message interpretation is stronger for more concrete individuals (H5).

Method

Participants

A sample of 454 adults with similar demographics from earlier studies were recruited from the Prolific crowdsourcing platform to participate in an online cross-sectional survey for monetary compensation. 13 respondents who did not pass at least one of the four attention check questions were removed for data analysis purposes, resulting in a sample of 441. 50.57% of participants were female (M = 39.95 years old, SD = 5.14).

Procedures and Measurements

Participants were informed that the purpose of the research was to assess consumers' perceptions of sustainable marketing claims from a fictious household care brand, Almat. To capture individual chronic level of construal, the proposed moderator of this study, respondents answered the 25-item BIF (Vallacher & Wegner, 1989) from earlier studies (α = .89). The study employed a within-subject factorial design. Each participant evaluated two of the 18 marketing claims tested, which included one high circular claim and one low circular claim as validated in the pre-test. Participants completed the Construct Construal Scale (α = .91) to assess how concretely each claim describes what the fictious brand was doing to help the environment (e.g., I have a clear picture of what Almat is doing to be sustainable). Each claim was evaluated by approximately 50 participants. In line with the pre-study, participants also rated the extent to which each of the 18 sustainable marketing claims encompasses activities which are circular. The survey closed with nine demographic

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items including gender, age, race/ethnicity, employment status, level of education, marital/live-in partner status, number of children, size of household, and annual income.

Analytical Approach

Because each participant rated only two claims, the dataset was restructured from wide to long, adding a participant ID to capture the within-subject component. As in the pretest, claims were double checked for perceived level of circularity. Mean circularity scores were computed and ranked. Using an independent samples t-test, means for the nine highest scoring circular claims and the nine lowest scoring circular claims were compared. To determine the main effects of message circularity on construal of sustainability and the interaction effect of individual chronic level of construal, I ran a moderated moderation regression analysis using Hayes PROCESS model 3. Message circularity was entered as the predictor variable; a dichotomous group variable corresponding to low/high circularity was entered as the moderator of message circularity to construal of sustainability relationship to reflect the fact that each participant saw both a low and high circular claim; chronic level of construal was entered as a moderator of low/high circularity between message circularity and construal of sustainability; and construal of sustainable messaging was the outcome variable. All continuous variables were mean centered.

Study 4's Results

The mean score for high circular claims ($M = 4.09$; $SD = 0.10$) was significantly more circular than the mean score of low circular claims ($M = 3.14$; $SD = 1.24$) $t(880) = -12.55$, $p <. 01$, reconfirming results from the pretest. Table 16 shows the mean and standard deviations for each of the sustainable claims used in the main study.

Table 16

High Circular Claims versus Low Circular Claims

Sustainable Claims	Mean	SD
High circularity		
Reusable	4.43	0.853
Recycled materials	4.41	0.815
Recyclable	4.36	0.888
Compostable	4.27	0.958
Zero Waste	4.26	0.973
Renewable	4.24	0.904
Sustainable	4.05	0.929
Refillable	4.15	0.954
Eco-friendly	3.71	1.135
Low Circularity		
Plant Based	3.51	1.191
0% Plastic	3.49	1.204
Biobased	3.39	1.163
Carbon neutral	3.37	1.119
Less Co2 emissions	3.19	1.118
Natural	3.18	1.195
Ozone friendly	3.14	1.206
Phosphate free	2.67	1.171
Non toxic	2.63	1.330

Per H3, there was a positive main effect of level of message circularity on construal of sustainability ($\beta = .27$, $p < .001$) and a negative main effect of low/high circularity on construal of sustainability ($\beta = -.42$, $p < .01$). Although there was no main effect of chronic construal on construal of sustainability ($\beta = .00$, n.s.), there was an interaction effect of chronic construal on the relationship between level of message circularity and construal of sustainability (H5) ($\beta = .02$, $p = .038$). The effect was stronger for more concrete people,

providing further evidence for H5. The same regression analysis was run controlling for age but was not significant and did not change the effects. For parsimony, the model was reported without age.

Summary

The objective of Study 4 was to externally validate that circular framed marketing messages employed in practice are more concrete than sustainably framed marketing messages (H3) and that the effect is stronger for more concrete individuals (H5). As predicted, results provide further evidence that as marketing claims increase in circularity, they also increase in how concretely they are interpreted. This effect is stronger for more concrete individuals. This pattern aligns with H3 and H5. Table 17 and Figure 7 highlight the results of Study 4.

Table 17

Moderated Moderation (Hayes PROCESS Model 3) Regression Results, Study 4

DV: Construal of Sustainability // IV: Circular Framing					
	Coefficient	SE	t	p	95% CI
Constant	3.96	0.07	57.48	<.001	[3.83, 4.10]
Circular Framing (CF)	.27	0.05	5.21	<.001	[.17, .37]
Circular Framing Low/High (CLH)	-.42	0.10	-4.25	<.001	[-.61, -.23]
CF X CLH	.06	0.08	.76	.447	[-.10, .23]
Chronic Construal (CC)	.00	0.01	-.40	.691	[-.03, .02]
CF x CC	.02	0.01	2.08	.038	[.00, .03]
CLH x CC	.00	0.02	.16	.870	[-.03, .03]
CF x CLH x CC	-.02	0.01	-1.52	.129	[-.05, .00]

Figure 7

Moderation Regression Results, Study 4
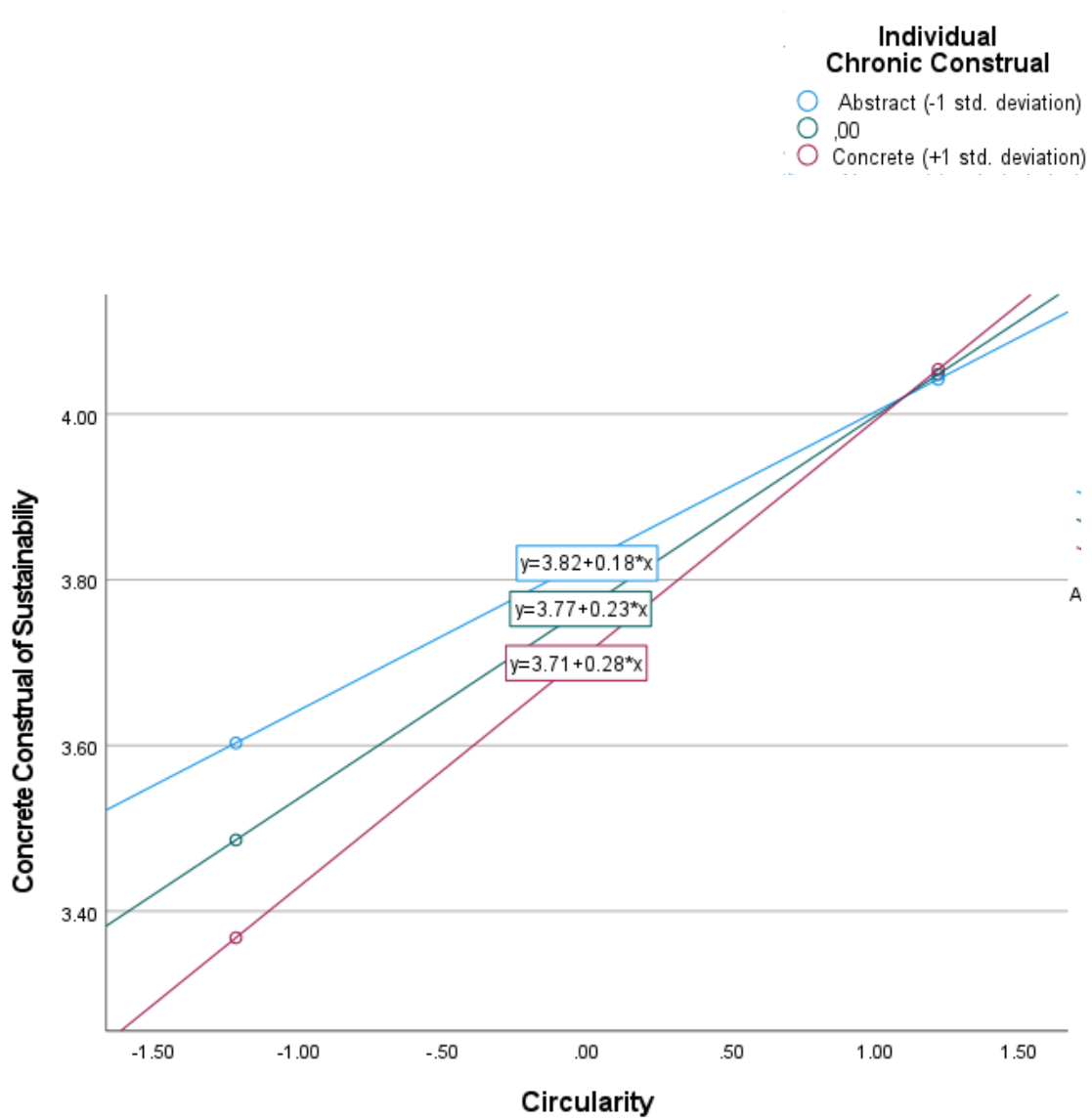
A high level of construal of sustainability is more concrete (low level more abstract)
A high level of circularity is more circular (low level less circular)

CHAPTER 5: DISCUSSION

Overview of Results

This research began with a literature review indicating that concretizing sustainability can have a positive impact on sustainable behaviors (Trudel, 2019; White et al., 2019) and determined that specific interventions could reduce the abstractness of the concept of sustainability, especially amongst more concrete individuals for whom sustainability is particularly abstract. To assess the potential for such an approach, I conducted four studies.

The first study sought to understand the relationship between how concretely people construe sustainability and their engagement in sustainable behaviors, as well as assess whether people's innate tendency to view information more concretely or abstractly (i.e., their chronic construal) affects this relationship. More specifically, I conducted a national, cross-sectional survey to evaluate whether: (1) more concrete construal of sustainability is related to more engagement in sustainable behaviors, (2) more concrete individuals are less likely to engage in sustainable behaviors and, (3) if the relationship between concrete construal of sustainability and engagement in sustainable behaviors is stronger for more concrete individuals.

Study 1 provided support for two of these predictions: engagement in sustainable behaviors is highest when the construct of sustainability is viewed as concrete (H1) and more chronically concrete individuals tended to engage less in sustainable behaviors (H2). As anticipated, individual chronic construal moderated the relationship between construal of sustainability and engagement in sustainable behaviors. Contrary to H4, which predicted that it should be stronger amongst more concrete individuals, the relationship between concreteness of construal of sustainability and sustainable behaviors was significant amongst most individuals, except those who were very concrete (9.2% of the sample).

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In Study 2, I assessed whether circular framed claims on packaging could prompt more concrete interpretation of sustainable messaging than traditional sustainably framed claims (H3) and whether this, in turn, could lead to willingness to pay a higher price for the advertised brand (H1). An online, single factorial experiment with two between-subjects message conditions (circular vs. sustainable framing) revealed that while abstract individuals perceived both circular and sustainable packaging as equally concrete, concrete individuals circular framing of sustainable messaging prompted a more concrete message interpretation.

In Study 3, I tested the immediate and lagged effect of a 6-minute educational video that presents circularity as a novel way to look at sustainability in an online experiment which was longitudinal in design. The video provided context regarding society's recent move to a linear economy (based on rapid consumption and wastage of resources) and how circularity, which is based on generation of zero waste through continual reusage of resources like in nature, can address this. The video also provided examples of circular businesses and suggestions for changes in personal consumption behavior. Results demonstrated that an educational video that frames sustainability as circularity did result in a more concrete interpretation of sustainability (H3). This more concrete interpretation of sustainability prompted both higher donations to charities that support sustainable initiatives (H1) and greater intentions to engage in sustainable behaviors, which led to reports of engaging in sustainable behaviors one week after the intervention (H1). The effects were significant at all levels of individual chronic construal. There was no moderating effect of chronic construal.

Study 4 investigated consumers' perceptions of commonly used sustainable marketing claims in household products to validate whether circular framed marketing messages were more concrete than traditional sustainably framed marketing messages, and to assess whether the effect is stronger for more concrete individuals. Data collected via an online, cross-sectional survey showed that consumers indeed perceive circular framed

marketing messages as more concrete, and this relationship between perceived circularity of a claim and concreteness is stronger for more concrete individuals.

Overall, this thesis furthers extant research that concrete individuals perceive sustainability and sustainable messaging as abstract (not directly predicted) and that, without an intervention, more concrete individuals engage less in sustainable behaviors. Furthermore, this research provides robust findings that concretizing sustainability with circular framing leads to more concrete construal of sustainability, which in turn motivates sustainable behavior. These findings suggest that for smaller interventions, such as circular messaging claims used on packaging, this type of concretizing messaging is especially helpful for more concrete individuals, whereas more substantial concretizing interventions can increase the concreteness of sustainability for all individuals, regardless of their chronic level of construal. Moreover, I found evidence of the downstream behavioral outcomes of circular framing interventions which were mediated through construal of sustainability, supported by an index of moderated mediation. In addition, my research points to several important theoretical contributions in the areas of construal level theory, sustainable consumption, and the CE.

Theoretical Contributions

Construal Level Theory

My research makes a theoretical contribution regarding the role of construal level theory in motivating sustainable consumption behavior. Prior research has examined ways to concretize sustainability by making it less psychology distant, including focusing on local issues and impact (Li et al., 2011; Spence et al., 2012), making effects more visible (Weber, 2015), social influence and establishing smaller, achievable milestones (White et al., 2019), focusing on future generations and legacy (Trudel, 2019; White et al., 2011; Zaval et al., 2015), outlining clear steps, employment of imagery and analogies (Reczek et al, 2018), and communication of concrete experiences (Marx et al., 2007). Other CLT research examines

how 'matching' levels of construct construal and individual chronic construal can influence behavior, including sustainable behavior. For instance, Goldsmith et al. (2016) determined that highlighting economic benefits of environmentally friendly products appeals to consumers with a concrete construal while Reczek et al. (2018) found that eco-friendly products can be made more appealing to consumers with concrete construal by providing more specific details and focusing on the present. Other research has shown how activating a future mindset to match the abstract construct of sustainability (Reczek et al., 2018) and matching loss framing with concrete construal and gain framing with abstract construal (Chang et al., 2015; White et al., 2011) can prompt sustainable behavior.

My research extends this stream of research that studies how changing construal of sustainability or sustainability messaging to match individual chronic level of construal can impact consumers' behavior by providing more nuanced evidence of the boundaries of this matching relationship with regards to level of individual chronic level of concrete construal and size of the messaging intervention. Study 1 showed that although more concrete construal of sustainability does lead to a more concrete interpretation of sustainability amongst more concrete people (i.e., those who tend not to engage in sustainable behavior), this more concrete interpretation does not always translate to behavioral change amongst very concrete people. More specifically, the correlation between more concrete construal of sustainability and sustainable behaviors is significant at most levels of individual chronic construal, except the most concrete individuals (9.2% of the sample). In other words, although these very concrete individuals have a concrete interpretation of sustainability, they still do not behave sustainably. This signals that there are other barriers which hinder their engagement in sustainable behaviors. Further research is needed to identify other moderators that may influence their behavior or whether matching concrete construal of sustainability to individual concrete construal simply does not work for very concrete people. Furthermore,

these findings demonstrate that a subtle intervention (more concrete circular framing of sustainable marketing messaging) can concretize construal of sustainable messaging for more concrete people and that a more substantial intervention (short educational video which reframes the abstract concept of sustainability as the more concrete concept of circularity) prompts more concrete construal of sustainability at all chronic levels of individual construal (abstract to concrete). The implication for construal level theory is that matching construct and individual construal to achieve behavioral change has boundaries. This research indicates that there are two factors that may influence the effects of matching construct construal and individual chronic construal: degree of individual concreteness and magnitude of the concretizing intervention.

The most surprising finding of this study is that concretization using a more substantial intervention (educational video) can also motivate abstract individuals, who already tend identify with sustainability and behave sustainably, to engage more in sustainable behaviors to the same degree as concrete individuals. This provides important learnings for construal theory and provides support for a previous finding which postulates that for constructs with a poor link between values and feasibility, as with the environment, activation of both abstract and concrete construal is required to maximize goal related behavior. In other words, it important to achieve an understanding of the goal's importance as well as provide specific steps on how to achieve the goal (Rabinovich et al., 2009).

Finally, these findings indicate that construal of sustainability mediates the treatment of circular framing and adoption of sustainable behaviors. This causal link provides evidence of the importance of construal of sustainability in changing behaviors and can provide impetus to other CLT researchers in recruiting this theory to affect behavioral change. This is critical not only in tackling behavioral change linked to the abstract concepts of the

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environment, climate change, and sustainability, but other abstract phenomena linked to technology, science, society, and business.

Sustainable Consumption Theory

Prior research on sustainable consumption has provided many suggestions on how to reduce the intention-behavior gap and prompt consumers to behave more sustainably. Several important intrinsic and extrinsic factors that influence people's adoption of sustainable consumption have been identified, including social norms, personal values and beliefs, identity, habits, feelings of personal responsibility, emotions, convenience, financial rewards, and product characteristics (Trudel, 2018, White et al., 2019). Most research has focused on factors that impact consumers' adoption of sustainable consumption within the realms of a specific sustainable activity such as recycling, energy conservation, purchase of eco-friendly products, and transportation (Peattie, 2010).

What is missing are solutions that can shift consumers' overall understanding of sustainability to prompt a more general shift to sustainable behavior. This is important because sustainable behavior is not made up of a single action, but rather encompasses a lifestyle requiring changes to many individual actions that make up daily behavioral patterns (Peattie, 2010). This research extends sustainable consumption theory by introducing a novel way for consumers to think about sustainability. Framing sustainability as circularity, the conceptual basis of the CE, has the potential to positively impact sustainable consumption patterns by making it more concrete and changing the way consumers perceive it. As a result, it has the potential to impact a variety of behaviors rather than just a single specific sustainable behavior. This broader approach extends prior theory in that it highlights the importance of achieving a common understanding of the concept of sustainability for widespread behavioral change and that this may be achieved by reframing the concept all together. This opens new avenues for future researchers, marketers, or policy makers to think

of new ways to fundamentally reframe the concept of sustainability to address the discrepancy between society's environmental concerns and actual behaviors.

As such, I address calls to examine new ways to make sustainability less abstract (Trudel, 2019), joining a small, but growing body of studies that provide specific recommendations to do so. These include focusing on local issues and impact (Li et al., 2011; Spence et al., 2012), making effects more visible (Weber, 2015), social influence and establishing smaller, achievable milestones (White et. al., 2019), focusing on future generations and legacy (Trudel, 2019; White et al., 2011; Zaval et al., 2015), outlining clear steps, employment of imagery, and analogies (Reczek et al, 2018), communication of concrete experiences (Marx et al., 2007), and showing product transformation in recycling (Winterich et al. 2019). Framing sustainability as circularity is a solution that encompasses and integrates many of these approaches, which is important as it has the potential to strengthen the level of concretization; hence appealing to more concrete individuals who currently do not identify with or engage with the abstract concept of sustainability. More specifically, framing sustainability as circularity focuses on 'how' rather than 'why' to operationalize sustainability by providing a clear context about what needs to change (the current linear economy which wastes over 90% of resources used to produce goods), a specific goal (zero waste) and measurement (% of resources which are circular), more immediate financial benefits of resource reutilization, specific behaviors to achieve continuous resource reusage (reduce, reuse, recycle, repair, and share), a visual anchor (circle), and analogies to the circularity of nature.

Addressing current gaps in the literature for specific measures to holistically make the concept of sustainability less abstract, I demonstrated that framing sustainable marketing messaging as circularity makes sustainable messaging more concrete for consumers and increases their engagement in sustainable behaviors and willingness to pay for a sustainably

positioned product. I also showed how framing sustainability as circularity with an educational video increases engagement in sustainable behaviors, both immediately and one week after the intervention. Finding an overarching mechanism that makes sustainability less abstract and impacts a broad range of sustainable behavioral activities is vital to step-change widespread adoption of sustainable consumption.

Circular Economy Literature

My findings have implications for the CE literature. I extend CE literature in two ways. First, by demonstrating that circularity is not merely a way to operationalize sustainable development, but also a motivating and relevant concept to more concretely explain what sustainability is and, by doing so, get consumers to change their behavior. Second, I show the applicability of CE principles in a geography in which that notion is still new, the U.S.

Most of the CE literature looks at circularity as an operationalization of sustainable development, focusing on waste reduction, resource utilization, zero waste manufacturing, closed loop supply chain, and business models (Kirchherr et al., 2018; Lieder & Rashid, 2015). Although policymakers and executives have suggested that consumer awareness and adoption remain key barriers to more widespread adoption, consumer acceptance and behavior with regards to circularity is significantly under researched. A review of the scientific and grey papers defining CE found that only 19% include the concept of consumption (Kirchherr et al., 2017). Most CE research involving consumers identify barriers and motivators to acceptance of a particular product, industry, or business model, usually in remanufacturing of consumer electronics or automobile and accommodation sharing (Camacho-Otero et al, 2018). Some scholars describe consumption or consumer involvement in the product design process. This research extends prior work in that it assesses consumers' acceptance of circularity as a holistic concept with the goal to drive a better understanding of

sustainability and ultimately behavioral change. This is critical to achieving widespread adoption of sustainable consumption behaviors.

In addition, there is a need to extend learnings of the CE to the U.S., where awareness and knowledge is relatively low compared to other sustainable topics such as climate change, biodiversity, carbon footprint, and biomass. Prior CE research focuses geographically on China and Europe, where legislative measures are already in place (Merli et al., 2018). The U.S., as a young, individualistic society, is culturally distinct versus the older, more collective societies of Europe and China, hence attitudes toward sustainability and related topics must be examined separately. This is important as circular business models begin to take hold in the U.S. and marketers and policymakers seek new ways to talk about sustainability to consumers in a manner they understand.

Methodological Contributions

Construct Construal Measurement

Robustly validated instruments for construct construal are lacking in academic research. Current measurements of construct construal include rating items (abstract/concrete or general/specific), BIF as a temporary state measure of level of construal activated (Macdonnell & White, 2015), measurements of psychological distance (Reczek, 2018), identifying gestalts (Wakslak, 2006), or analyzing written descriptions of the construct for abstractness of language (Fujta et al., 2006). I contribute methodologically to CLT theory by establishing the Construct Scale as a way of measuring the degree to which an individual construes a construct as abstract/concrete. My research validated the Construct Construal Scale as a suitable measure for a substantive analysis of construct construal. Testing demonstrated that the scale adequately measured previously tested concrete constructs as concrete and abstract constructs as abstract. Moreover, reliability testing for measuring the construal of the sustainability construct over four studies demonstrated good internal

consistency with Cronbach's alpha ranging from .76 to .93. The studies also provide evidence of predictive validity given the relationships of construct construal and various behavioral outcomes. It is anticipated that this new measurement tool could be applied to various types of CLT research, where understanding the inherent construal of a construct linked to consumer behavior (e.g., marketing or public policy) is important. Learnings gathered from such studies could be extremely relevant to CLT researchers.

BDM Donation Measurement

The Becker-DeGroot-Marschak (BDM: Becker et al., 1964) is a well-established measurement of implementation intentions in academic marketing and economic research. It captures a behavioral outcome (Hulland & Houston, 2021) by measuring willingness to pay for a product at various incremental levels of money. To evaluate behavioral change with regards to engagement in sustainable behaviors, I successfully adapted this tool to measure willingness to donate to a charity by offering participants the opportunity to donate or keep various potential incremental levels of a potential monetary bonus. Although sustainability research often employs charity donations as a measurement of behavioral change, it has not, to the best of my knowledge, employed a form of the BDM measurement. This nuance to the BDM measurement could be applied to various types of marketing and economic research, where understanding willingness to donate is an important measurement of behavioral change. Learnings gathered could be extremely relevant to pro-social marketing researchers.

Managerial Contributions

Selling Sustainability in Policy

Findings have important policy implications for how to step change understanding and acceptance of sustainable development, and ultimately change behavior in society. Past research suggests that there is a substantial intention-behavior gap when it comes to adoption of sustainable behaviors (Trudel, 2019; White et al., 2019) which can be addressed by

promoting values, attitudes, and behaviors linked to psychological factors that facilitate

sustainable development (Iyer & Reczek, 2017). The recently established Sustainable

Development Goals from the United Nations includes education about sustainable

development and global citizenship to ensure individuals have the knowledge and skills to

promote sustainability across society.

Europe and China have already begun to adopt legislation linked to circularity, while

circular business models are growing in popularity in the U.S. Most communication still

focuses on traditional sustainability messaging such as the UN Sustainability Development

Goals, resulting in a mismatch between operationalization of sustainability as circularity and

how it is broadly being communicated to the public. The current research provides important

impetus to policy makers and marketers that education which concretizes the abstract concept

of sustainability can be an important lever to sustainable behavioral change. Furthermore,

circularity offers not only a way to implement sustainability, but also a concept to motivate

citizens to participate. One format of providing this information is through educational

videos, an increasingly popular digital format across a variety of topics. For perspective, 74%

of adults in the U.S. claim to have used YouTube and 62% of YouTube users access the

platform daily (Statista, 2020). Another important contribution is the newly validated

Construct Construal Scale as a reliable scale to measure how abstractly or concretely people

construe sustainability. This measurement may be employed by policymakers to assess the

effect of new policies or interventions that aim to make sustainability more concrete.

In summary, my research contributes important learnings for policy on sustainable

development. It provides initial evidence that, beyond offering a viable economic solution to

operationalize sustainable development, the concept of circularity can concretize the abstract

construct of sustainability, shifting the paradigm of sustainable behavior and consumers'

willingness to engage. This knowledge can be used by governments and policymakers to

develop interventions and communication campaigns that have the potential to step-change consumer acceptance and adoption of sustainable behaviors.

Promoting Sustainable Consumption for Companies and Non-Profit Organizations

One of the core challenges that firms and nonprofit organizations face with regards to sustainable initiatives is how to promote them to consumers and other stakeholders (White et al., 2019). This is exacerbated by widespread usage of greenwashing and overall consumer distrust of sustainable claims (Chen & Chang, 2013). Findings from my research provide guidance for organizations seeking to promote sustainable consumption by suggesting that concretization of sustainable marketing messaging leads to more tangible interpretation which in turn prompts more willingness to purchase sustainable products and engage in sustainable behaviors. For businesses, adopting circular business models and practices such as circular supplies, resource value recovery, product life extension, product service systems, sharing platforms, and virtualization will not only aid in implementation of sustainable growth initiatives, but also enable more concrete, circular messaging, which, in turn, leads to higher levels of purchase. In addition, when looking at product claims for packaging and other forms of communication currently used in the market, it is preferable for brands to use highly circular claims such as reusable, recyclable, zero waste, renewable, and refillable as these are more concretely construed than low circular claims such as carbon neutral, less CO_2 emissions, natural, ozone friendly, phosphate free, and non-toxic.

For non-profit organizations which advocate support for sustainable causes, circular framing can be implemented to increase engagement in social issues and motivate behavioral change. Concretizing the interpretation of social causes and associated messaging using circular framing may help increase societal participation in these causes. Finally, in line with my suggestion for policymakers, the Construct Construal Scale may be employed to measure the level of concreteness of different sustainable platforms, causes, and messaging, enabling

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companies and organizations to benchmark, measure, and select the most concrete form of communication. To the best of my knowledge, there is no measurement tool that does this.

Limitations

I note that this research has potential limitations. First, from a sampling perspective, the research was only conducted amongst consumers in the U.S., with the aim of assessing potential in a region which is nascent with regards to the CE. To further validate these learnings, future research should expand to populations residing outside of the U.S. This would be particularly useful in regions such as Europe and China, given that, legislatively, adoption of the CE has already commenced, and consumer communication is still based in more traditional sustainable messaging. Furthermore, given the limitation of the COVID-19 pandemic, all participants were recruited using an online crowdsourcing platform. Although measures were taken to ensure national representation, participants who regularly participate in a online research platforms may have a unique profile. As such, there is an opportunity for future research to engage participants live, outside of an online platform, using more traditional laboratory settings and sampling procedures.

Second, my research only evaluated the effect of measures to frame sustainability as circularity in the form of packaging claims for household products and a short educational video that frames sustainability as circularity. Both interventions were suitable for online testing. To fully understand the potential application and effects of framing sustainability as circularity, future research could explore other messages, messaging formats (e.g., advertising, pictures, online messaging, white papers, documentary) and contexts (e.g., industries or general categories such as packaging, natural resource usage, or manufacturing). This is critical to determining the potential of widespread application of framing sustainability as circularity.

Third, although I incorporated behavioral measures such as willingness to pay and willingness to donate to causes, I had to rely on self-reported sustainable behaviors. Future research should embrace a greater array of behavioral measures (Hulland & Houston, 2021) to assess the longer-term impact of circularity framing interventions on consumers' sustainable choices over a variety of sustainable behaviors. To determine the true effect of a circularity intervention on behavior, future research could include mixed-method field studies, panel data, diary, garbology (analysis of waste) (Cote et al., 1985), observation of in-home behavior over time, and additional longitudinal field experiments.

Finally, as the data collection took place throughout the COVID-19 pandemic, awareness of the environment and the impact it can have on well-being may have been more pronounced. This may have impacted consumers' willingness to engage in sustainable behavior. The COVID-19 pandemic also changed consumption patterns, including shopping in a broad sense, quantities of products purchased, and types of products purchased (Galoni et al., 2020; Sheth, 2020).

Future Research

Findings suggest several avenues for future research. Since this is the first investigation of how framing sustainability as circularity prompts more concrete construal of sustainability and hence more engagement in sustainable behavior, various opportunities exist for validating this proposal. Phenomenological research and case studies (Creswell & Creswell, 1990) can provide insights as to why circularity is perceived as more concrete and how perceptions of concreteness differ between more abstract and more concrete individuals. Participatory action research, whereby a researcher observes and facilitates members of an organization/community go through an iterative transformation process (Symon & Cassell, 2012) with regards to sustainable behavior based on introduction to principles of the CE

could provide important perspective to regarding the development, process of implementation, and effective change brought about by reframing sustainability as circularity.

Further investigation of other moderators besides individual chronic level of construal will help researchers and practitioners develop measures that strengthen the effect of circular framing on construal of sustainability and ultimately on sustainable behaviors. This may include extrinsic moderators such as level of training and education and type of information on circularity as well or more intrinsic individual variables such level of ambivalence, avoidance, or controllability. Finally, additional research is recommended to further validate and establish discriminant validity for the Construct Construal Scale, not only as a measurement for the construct of sustainability but for other constructs as well.

Conclusion

Given the current values-behavior gap with regards to sustainable consumption, there is a significant need for specific techniques to motivate consumers to behave sustainably. This research offers encouraging evidence that circularity can provide a new sustainability paradigm that has the potential to concretize consumers' understanding of sustainability and ultimately shift consumption patterns. More specifically, my findings demonstrate that framing sustainability as circularity prompts more engagement in sustainable behaviors by providing consumers with a more concrete interpretation of sustainability. For marketing messaging and packaging claims, this is particularly valid for more concrete individuals (who generally engage less in sustainable behaviors). Reframing sustainability as circularity more broadly using an educational video has the potential to motivate more sustainable consumption at all individual chronic levels of construal (abstract to concrete).

The CE represents an innovative economic model and solution to achieving sustainable growth. Instead of reliance on expansion through stimulation of mass production, consumption, and rapid disposal, economic expansion stems from circularity, defined as the

ongoing reutilization of resources and materials with the ultimate goal of generating zero waste (Esposito et al., 2018). Adoption of circularity has commenced, legislatively, in both Europe and China. Moreover, top tier networks of business, cities, governments, researchers, and thought leaders (e.g., Ellen MacArthur Foundation) have accelerated its diffusion. It is an ongoing agenda item at the World Economic Forum. Nevertheless, CE is still nascent in the U.S.; no significant legislation exists and only 28% claim to be aware of CE. Findings from my research indicate shifting towards circularity and circular messaging in the U.S. offers the potential to change consumption patterns. This knowledge has important implications for both companies and policymakers in developing strategies and messaging to step-change consumer acceptance and adoption of sustainable behaviors.

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TABLES

Table 1

Abstract Traits of Sustainability versus Concrete Traits of Circularity

Concrete and Abstract Traits of Circularity vs. Sustainability for Consumers		
	Sustainability	**Circularity**
Concept	**Conceptually** vague, ambiguous and lacks a cohesive schema. Three pillars of sustainability represent broad and abstract categories. Various related concepts including corporate social responsibility, continuity, eco-friendly, bio, clean, organic contribute to confusion and lack of clarity.	**Conceptually** concrete, with a cohesive schema: Circle as a visual and verbal foundation of the concept. Name: circular economy Measurement: circularity Context: linear versus circular Analogy: circularity of nature Associated behaviors: mostly starting with "re" connected to return - reduce, reuse, recycle, repair
Context	**Context is distal and abstract:** climate change and environmental degradation	**Context is proximal and concrete:** current linear economy (take-make-waste) circularity of nature
Goals	More abstract superordinate goals based on values and ideology **(**for future generations, environment preservation and social justice) **are not supported by concrete subordinate goals and measurements**, which are numerous and ambiguous.	Superordinate goal of environmental protection and economic growth is **supported by concrete subordinate goals and measurements** including achieving zero waste, circularity rate (e.g. percentage of resources being reused).
Benefits	**Benefits are aggregate** and not individual: future generations, third world countries, society as a whole. Motivation to participate is value based: doing good for future generations	**Benefits are both aggregate and individual**: economic growth and resource preservation Motivation to participate: impact (economic) is more immediate
Feasibility of Outcome	Emphasis on abstract outcomes of a sustainable, just planet and continuity is **based on desirability**. **Feasibility** of outcomes is not concrete: sustainability is often perceived as too big an issue for personal impact and there is lack of trust with regards to feasibility. Requires various, fragmented behaviors (recycling, energy conservation, mobility, green products) to achieve.	Outcome of economic growth and resource preservation made feasible by concrete actions: circulating resources (outputs = inputs) and behaviors (reduce, reuse, recycle, repair and share)

Table 2

Overview of Studies

Study Overview			
	Purpose	**Study Design**	**Sample Size**
Pre-study 1A	Validate construal of sustainability measurement	Online cross-sectional survey	418
Pre-study 1B	Feedback on survey flow and ecological validity	Telephone survey and interview	9
Study 1	Test H1, H2 and H4. Validate measurements for construal of sustainability, sustainable behaviors and individual chronic construal	Online cross-sectional survey	500
Pre-study 2	Manipulation test: circular versus sustainable message conditions in the form of pack claims and mission statements	Online cross-sectional survey	60
Study 2	Assess the full model (H1-H5) based on packaging claims	Single factorial online experiment: 2 between-subjects message conditions (circular/sustainable framing)	245
Pre-study 3	Validate manipulation (educational video on circularity / control video) and operationalization of sustainable behavior.	Single factorial online experiment with 2 between-subjects conditions (circular framing/control group)	100
Study 3	Assess the full model (H1-H5) based on a short educational video.	Single factorial online experiment (longitudinal) with 2 between-subjects conditions (circular framing and control group)	386
Pre-study 4	Manipulation check: determine the extent to which consumers perceive commonly used sustainable marketing claims for household and personal care products as circular.	Online cross-sectional survey, within-subjects design	60
Study 4	Validate whether circular framed marketing messages are more concrete than sustainably framed marketing messages (H3), and if the effect is stronger for people with more concrete chronic construal (H5).	Online cross-sectional survey, within-subjects design	454

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APPENDIX A: IRB APPROVAL LETTER

PEPPERDINE

NOTICE OF APPROVAL FOR HUMAN RESEARCH

Date: September 22, 2020

Protocol Investigator Name: Jolie Gutentag

Protocol #: 20-08-1423

Project Title: Concretizing Sustainability with Circularity: Closing the Circle on Sustainable Consumption

School: Graziadio School of Business and Management

Dear Jolie Gutentag:

Thank you for submitting your application for exempt review to Pepperdine University's Institutional Review Board (IRB). We appreciate the work you have done on your proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations 45 CFR 46.101 that govern the protections of human subjects.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit an amendment to the IRB. Since your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite the best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the IRB as soon as possible. We will ask for a complete written explanation of the event and your written response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the IRB and documenting the adverse event can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* at community.pepperdine.edu/irb.

Please refer to the protocol number denoted above in all communication or correspondence related to your application and this approval. Should you have additional questions or require clarification of the contents of this letter, please contact the IRB Office. On behalf of the IRB, I wish you success in this scholarly pursuit.

Sincerely,

Judy Ho, Ph.D., IRB Chair

cc: Mrs. Katy Carr, Assistant Provost for Research

Factors	Items

<u>Behavioral Identification (BIF)</u>
Personal level of construal.
* Abstract identification
	Please choose the description that best describes the behavior for you.
	1. Making a list
	   • Getting organized*
	   • Writing things down
	2. Reading
	   • Following lines of print
	   • Gaining knowledge*
	3. Joining the army
	   • Helping the Nation's defense*
	   • Signing up
	4. Washing clothes
	   • Removing odors from clothes*
	   • Putting clothes into the machine
	5. Picking an apple
	   • Getting something to eat*
	   • Pulling an apple off a branch
	Chopping down a tree
	   • Wielding an axe
	   • Getting firewood*
	Measuring a room for carpeting
	   • Getting ready to remodel*
	   • Using a yardstick
	Cleaning the house
	   • Showing one's cleanliness*
	   • Vacuuming the floor
	Painting a room
	   • Applying the brush strokes
	   • Making the room look fresh*
	Paying rent
	   • Maintaining a place to live*
	   • Writing a check
	Caring for houseplants
	   • Watering plants
	   • Making the room look nice*
	Locking the door
	   • Putting a key in the lock
	   • Securing the house*
	Voting
	   • Influencing the election*
	   • Marking a ballot
	Climbing a tree
	   • Getting a good view*
	   • Holding on to branches
	Filling out a personality test
	   • Answering questions
	   • Revealing what you're like*
	Brushing teeth
	   • Preventing tooth decay*
	   • Moving a brush around in one's mouth
	Taking a test
	   • Answering questions
	   • Showing one's knowledge*

	Greeting someone
	   • Saying hello
	   • Showing friendliness*
	Resisting temptation
	   • Saying 'no"
	   • Showing moral courage*
	Eating
	   • Getting good nutrition*
	   • Chewing and swallowing
	Growing a garden
	   • Planting seeds
	   • Getting fresh vegetables*
	Traveling by car
	   • Following a map
	   • Seeing countryside*
	Having a cavity filled
	   • Protecting your teeth*
	   • Going to the dentist
	Talking to a child
	   • Teaching a child something*
	   • Using simple words
	Pushing a doorbell
	   • Moving a finger
	   • Seeing if someone is home*

Construct Construal Scale 7-point scale (1 = strongly disagree, 7 = strongly agree)	1. I have a clear picture of sustainability 2. The image of sustainability comes to my mind right away 3. Sustainability is a difficult item to think about (R) 4. I need more information about sustainability to make myself a clear idea of what it is (R) 5. Sustainability is not that easy to picture (R) 6. Sustainability is easy to describe to another person 7. I feel that sustainability is very general to very specific 8. I feel that sustainability is very abstract to very concrete
Attitudes/values towards sustainability 7-point scale (1 = strongly disagree, 7 = strongly agree).	1. It is important to me that the products I use do not harm the environment". 2. I consider the potential environmental impact of my actions when making many of my decisions, 3. My purchase habits are affected by my concern for our environment 4. I am concerned about wasting the resources of our planet 5. I would describe myself as environmentally responsible 6. I am willing to be inconvenienced in order to take actions that are more environmentally friendly
Sustainable Behaviors 7-point scale (1=never, 7 = always).	1. How often do you separate your household garbage (i.e., glass, papers) for either curbside pick-up or to take to the nearest recycling center? SB2: How often do you use reusable containers to store food in your refrigerator rather than wrapping food in an aluminum foil or plastic wrap? SB3: How often do you conserve water while washing dishes? SB4: How often do you conserve energy by turning off light switches when leaving a room, turning down the thermostat when leaving home, and so forth? SB5: How often do you conserve water while brushing your teeth, shaving, washing your hands, bathing and so forth? SB6: When disposing of durables such as appliances, furniture, clothing, linens and so forth, how often do you either give this item to someone else, sell it to someone else, or donate the item to a charitable organization? SB7: How often do you refuse to buy products that you feel have extensive packaging?

	SB8: How often do you repair your belongings when they are broken or need repair instead of throwing them away"? SB9: How often do you borrow, share, rent or lease products rather than purchasing them?"
Awareness of the Circular Economy 7-point scale (1= strongly disagree, 7 = strongly agree)	ACE 1. I am familiar with the circular economy. ACE2. I am knowledgeable about the circular economy.
Psychological Distance to Sustainability PD1: 7-point scale (1 = strongly disagree, 7 = strongly agree)	1. Sustainability impacts me and people like me 2. Sustainability impacts my local area 3. Sustainability impacts the present 4. The impacts of sustainability are certain 5. Please rate the degree to which sustainability feels very close to very far away. (R)
Sustainable Articles to download	1. "How to fix items rather than replace them" 2. "Best Eco Grooming Products" 3. "How to Reduce Plastic" 4. "Sustainable Managing Electric Waste" 5. "Reducing Waste at Home" 6. "Ways to Live More Sustainably" 7. "Best Eco Cleaning Products" 8. "Sustainable Transport and Cars" 9. "Sharing Economy" 10. "Ways to Save Energy" 11. "Products that Last a Lifetime" 12. "Sustainable Choices in Fashion" 13. "How to effectively Recycle"
Sustainable Apps to download	1. **Good Guide** rates products according to health, environmental and social benefits 2. **PaperKarma** reduces the amount of paper junk mail coming to your house 3. **Ecosia** search engine that donates the profits from ads to plant trees 4. **Good on you** make informed sustainable choices when buying your clothes 5. **Tap app** find water refill stations near you on the go 6. **Happycow** find vegan and vegetarian restaurants 7. **IHuerting** how to grow and care for your own vegetable garden 8.**Think Dirty** find eco-friendly beauty and grooming products. Rate products you already have in your bathroom 9.**Natrehub** connects you to green, socially responsible local businesses around you 10. **Good fish guide** find fish that comes from sustainable farms or stocks 11. **DoneGood** online shopping assistant that recommends the best sustainable brands while you shop.

Pre-study 2

<u>Sustainability Mission Statement</u>

<u>Circular framing</u>   <u>Sustainable Framing</u>

Study 2

Sustainable Packaging Claims

<u>Circular Framing</u>   <u>Sustainable Framing</u>

120

Study 3

Sustainability Framed as Circularity Training Video (storyboards)

PEPPERDINE | GRAZIADIO
BUSINESS SCHOOL

IRB Number # 20-08-1423
Study Title: Closing the Circle on Sustainable Consumption

<u>Invitation to Participate</u>
My name is Jolie Gutentag. I am conducting a study on people's perception of sustainability, sustainable messaging and the associated effect on sustainable consumption behaviors. If you are 19 years of age or older, you may participate in this research.

What is the reason for doing this research study?
The data gathered from this study will be primarily used as the basis for writing my doctoral dissertation at Pepperdine Graziadio School of Business. In addition, it may be used to write articles for publication in both academic or business journals.

What will be done during this research study?
Participation in this study will require approximately 15 minutes. You will be asked to complete and submit a web-based survey which includes questions about your perception of sustainability, your level of engagement in sustainable activities and your evaluation of sustainable messaging. Participation will take place online through the Prolific platform using your own electronic device at a location of your own choice.

What are the possible risks of being in this research study?
There are no known risks or discomforts associated with this research. You may decide not to complete the questionnaire for any reason at any time.

What are the possible benefits to you?
The results of this study will be used to write my doctoral dissertation. If successful, this may be used to guide businesses and policy makers simplify sustainable messaging in order to encourage people to engage in sustainable behaviors. This, in turn, can have a positive impact on the environment, benefiting society as a whole.

How will information about you be protected?
Your responses to this survey will be kept anonymous and answers will not be identifiable to one particular participant. Results will be presented on an aggregate basis together with answers from other participants.

What are your rights as a research subject?

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. For study related questions, please contact the investigator(s): Jolie Gutentag at jolie.gutentag@pepperdine.edu.

For questions concerning your rights or complaints about the research, contact the Institutional Review Board (IRB):

• Phone 1 (310) 568-2305
• Email: gpsirg@pepperdine.edu

What will happen if you decide not to be in this research study or decide to stop participating once you start?

You can decide not to be in this research study, or you can stop being in this research study ("withdraw') at any time before, during, or after the research begins for any reason. Deciding not to be in this research study or deciding to withdraw will not affect your relationship with the investigator, with Pepperdine University or with Prolific.

Documentation of Informed Consent

You are voluntarily making a decision whether or not to participate in this research study. By clicking on the I Agree button below, your consent to participate is implied. You should print a copy of this page for your records.