Exploring Psychological Boundary Conditions of Priming in Promoting Sustainable Consumption

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Abstract

Sustainable products and services are becoming popular in the market, but in some areas, sustainable projects are not as effective as governments and companies had hoped they would be (e.g., aviation voluntary carbon offsets). To promote sustainable consumption, many marketing interventions attempt to encourage sustainable consumption by altering attitudes, nevertheless, these are not always successful because consumers may not follow through on attitudes due to a variety of factors. Thus, many researchers in marketing and consumer research have explored using alternative strategies, such as *priming*, to aid consumers to achieve their attitudes. As a behavioural change technique that triggers non-conscious processing, priming is economical to conduct and could be effective in many situations. However, different types of priming (e.g., health priming, construal priming) have different levels of effectiveness in various purchase contexts, which has been subject to limited integral scrutiny. Through three essays, this thesis maps the conceptual framework that summarises different approaches to priming sustainable purchases from theoretical and methodological perspectives in various contexts (*Essay One*), explores the conditions in which priming thwarts consumers executing sustainable purchases (*Essay Two*), and delineates the conditions in which priming empowers consumers to take responsibility of protecting the environment when making purchase decisions (*Essay Three*). This thesis offers several contributions. By integrating general, theoretical, and methodological characteristics of past research on priming sustainable consumption, it provides an overview of research foci and gaps in the area, outlines consumption topics studied, and taxonomises different variables. Moreover, the thesis identifies a mechanism where priming could lead consumers to unload their responsibility of protecting the environment, thus elucidating why many consumers do not follow their environmental-friendly values and attitudes. Finally, the thesis delineates a decision process in which priming could empower consumers to be

environmentally responsible and identifies several boundary conditions of a such process.

Keywords: Sustainable consumption, priming, motivated reasoning, self-accountability, environmental responsibilisation

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1. Chapter One: Introduction and Research Overview

This thesis examines, through three essays, the role of priming in promoting sustainable consumption, especially in the consumption context where carbon emissions are considerable and consumers are not very positively responsive to sustainable choices (e.g., aviation voluntary carbon offsets). The current introduction chapter discusses the purpose of the thesis (Section 1.1). Then, it reviews how sustainable consumption in marketing correlates with the important role that consumers play and how priming works in influencing consumer behaviour (Section 1.2). Finally, this chapter introduces the motivations, aims, methods, and contributions of the three essays (Section 1.3).

1.1. Purpose Statement

To take responsibility for tackling environmental challenges, such as waste disposal (Liu, Oosterveer, & Spaargaren, 2016), and enjoy long-term strategical benefits (e.g., leveraging emerging technologies) (Kotler, Kartajaya, & Setiawan 2010), many companies, to various degrees, are employing new business models that encourage sustainable consumption (e.g., sharing economy) (White, Habib, & Hardisty, 2019). In accordance with this trend, marketers try to spur more sustainable purchase behaviour. Partially because of the dominance of standard economic models (Elster, 1986), most conventional interventions have relied on attitude change as a route to behaviour modification (Dolan, et al, 2012; Lunde, 2018). However, the problem is that the behaviour often is mismatched with the attitudes (Davies et al., 2020; Kollmuss & Agyeman, 2002; Paço, Shiel, & Alves, 2019). Therefore, another stream of behavioural change techniques that do not focus on changing attitudes, *priming*, is considered an important alternative approach to encouraging sustainable consumption (e.g., Costa Pinto, Herter, Rossi, & Borges, 2014; Weissmann, &

Hock, 2022; Yan, Keh, & Wang, 2021).

Priming - a behavioural change technique that activates cognitive representations within associative memory to change individuals' behaviour in the desired direction - is pervasive in sustainable marketing. For example, priming a dieting goal can encourage consumers to choose more healthy foods (Papies & Hamstra, 2010), and priming the concept of creativity by calibrating the product package can increase the rate of product reuse and upcycle (Tarabashkina, Devine, & Quester, 2022), and when priming global identity, consumers tend to have more access-based consumption (i.e., sharing economy) (Nie, Yang, Zhang, & Janakiraman, 2022). Nevertheless, the effectiveness of the priming effect is not cross-situational consistent, which means the presence of a prime may induce a consistent response or reactant response (Minton, Cornwell, & Kahle, 2017). As an example of *consistent* response, when consumers are primed with a healthy recipe poster, consumers tend to have fewer meat samples than consumers receiving no priming (Papies & Hamstra, 2010). By contrast, an example of a *reactant* response would be a low-quality brand slogan (e.g., “Save More. Live Better”) that primes consumers to spend more money than when primed with a high-quality brand slogan (Laran & Janiszewski, 2011). This suggests boundary conditions or conditionalities of priming effects.

Although some research has already investigated boundary conditions of priming in promoting sustainable consumption, such as the moderation effect of pro-environmental attitude (Tate, Stewart, & Daly, 2014), scepticism (Minton, 2015), and frame (gain/loss) (Do, Wang, & Guchait, 2021), the deployment of priming can still be complex for marketers and policymakers. Different types of priming could face different conditionalities. For example, a conditionality of materialism priming may not be applied to power priming (Talukdar & Yu, 2020). In addition, conditionalities are possibly not able to be applied across different consumption contexts, for instance, the moderation effect of review valence in the context of

resort booking, may not be able to be applied to the context of saving and recycling behaviour (Kim, Tanford, & Book, 2021). Therefore, it is important for marketers and policymakers to carefully consider appropriate moderation factors that match the outcomes, methods, stimuli, and contexts of priming and consumption contexts. To facilitate this application, there is a need to synthesise dispersed and scattered studies that delineate different conditionalities of different priming, to theorise conditionalities into a taxonomy and a coordinate system, which outlines the characteristics of moderators.

This *consistent*/*reactant* dilemma also accords with the discussion about individuals' reactions toward moral obligations. According to Bandura (2002, 2014), moral decisions are motivated and regulated by personal and social standards, from which sanctions result from behaviour that deviates. To avoid negative self-condemning affect (e.g., guilt) stemming from personal standards and social pressure stemming from social standards, individuals tend to adhere to moral obligations (Bandura, 2002). For example, moral priming could encourage individuals to take more responsibility for taking care of others (Aquino, Freeman, Reed II, Lim, & Felps, 2009) and aid consumers to provide authentic and accurate reviews of their consumption experiences (Adjei, Zhang, Bagherzadeh, Farhang, & Bhattarai, 2022). Whereas, self-regulatory mechanisms do not function if they are not activated. In such conditions, individuals may avoid experiencing negative affects through moral-disengagement even deviating from self-standards (Bandura, 2002). For instance, self-construal priming may induce more consumer unethical behaviour when using peer-to-peer accommodation services (Peng, Wang, Huang, & Wang, 2022).

However, prior research is deficient in investigating the cognitive processes by which priming stimulates consistent/reactant responses toward sustainable consumption, as well as the conditionalities. The growing research interest in priming sustainable consumption lacks a theoretical perspective in the numerous empirical studies. Instead, the majority of these

studies examine how companies and policymakers employ various priming strategies in promoting sustainable actions in many contexts from a practical perspective. For instance, moral priming is applied to encourage purchasing organic food (Panzone, Ulph, Hilton, Gortemaker, & Tajudeen, 2021), global identity priming is employed to promote sustainable tourism (Nie et al., 2022), and sustainable priming is used to spur recycling behaviour (Clot, Della Giusta, & Jewell, 2022) and to increase the acceptance of new sustainable infrastructure (Gómez-Román, Sabucedo, Alzate, & Medina, 2021). As discussed above, while the various empirical investigations on priming strategy elucidate its practical applications in several areas, many of these studies fail to account for how priming may reduce/enhance sustainable purchase and under what conditions the reduction/enhancement is stronger or weaker.

As the cognitive processes and conditionalities of priming are under-explored in general (Albarracin, & Dai, 2021), the lack of theoretical explication on priming is particularly prominent in the sustainable consumption area (Minton et al., 2017). This theoretical deficiency is especially problematic for both academia and companies, given that researchers desire to acquire more theoretical comprehension of cognitive processes and conditionalities of priming to help avoid reactant responses when promoting sustainable consumption. For companies, as a useful behavioural change technique in promoting sustainable consumption (Lee et al., 2020; Panzone et al., 2021), priming is supposed to be facilitative to strengthening companies' sustainable strategies, helping brands design sustainable images, and smoothing the implementation of sustainable policies. Thus, it is essential to investigate and comprehend the cognitive processes and conditionalities of priming in sustainability in order to apply priming strategies more effectively and constrain the risk of occurring reactant responses. To address this lack of theoretical clarity and to further explore the value and the role of priming in sustainable consumption, this thesis

examines the process by which priming may decrease sustainable consumption and its potential conditionality, and identifies the process by which priming may increase sustainable consumption and its potential conditionality.

To conclude, the purpose of the thesis is threefold. First, it aims to map and catalogue existing research on priming interventions targeting sustainable consumption, synthesise scattered empirical information and delineate theoretical and methodological characteristics of this area. Thus, facilitating the application of priming strategy and bringing about future research agenda. Second, this thesis explores a mechanism that could explain why and under what conditions reactant responses may occur when applying priming interventions to promote sustainable consumption. Thus, explicating the negative side of employing priming in sustainability. Third, it tends to identify a mechanism that priming could empower consumers to take pro-environmental responsibility and explore its conditionalities. Thus, envisioning new possibilities for encouraging and empowering consumers to play a more essential role in sustainability. In what follows, this chapter reviews the literature about the relationship between sustainable consumption and consumers, as well as how priming works in influencing consumer behaviour.

1.2. What Is Sustainable Consumption and Priming

1.2.1. Sustainable consumption and consumer behaviour

This part presents an overview of sustainable consumption and production and introduces the research status of sustainable consumption in the consumer behaviour field. In light of global environmental challenges such as climate change, sustainable consumption and production were first formally introduced during the 1992 World Summit on Sustainable Development, which is defined by *UK Department for Environment, Food & Rural Affairs*

(DEFRA) as:

> Continuous economic and social progress that respects the limits of the Earth's ecosystems and meets the needs and aspirations of everyone for a better quality of life, now and for future generations to come (DEFRA, 2005).

Sustainable consumption and production have been an important challenge for human beings in the 21st century. For example, the UN has recognised it as the 12th goal of its programmatic document: *Transforming Our World: 2030 Agenda for Sustainable Development* (United Nations, 2015). The 12th goal includes "Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle" (Point 12.6) as the supply-side (i.e., producers) request and "ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature" (Point 12.8) as the demand-side (e.g., consumers) requirement. Therefore, many countries have started pursuing sustainable consumption and production goal, even since an earlier time and kept implementing related policies to embrace the sustainable consumption and production goal (Cohen & Munoz, 2016). For instance, the UK domestic material consumption drops from 10.3 tonnes per capita in 2013 to 8.85 tonnes per capita in 2015 (UK Government, 2019).

Pursuing the sustainable consumption and production development goal is pivotal in striving to change social practices both from the supply side and demand side, as mentioned above. As for the supply side, companies create, produce, and innovate green products and services into the market to gain profit (i.e., eco-innovation) (Hensen, Keeling, de Ruyter, Wetzels, & de Jong, 2016). Characterised green products, such as biodegradable detergents, inverter air conditioners, and biodegradable shoes and clothing, are penetrating deeply into every corner of some markets (Lee, Kim, Jim, & Choi, 2014). With respect to services, some coffee shops in the UK introduce a surcharge on disposable paper cups (dubbed the "Latte

Levy") to increase the use of reusable mugs (Hubbub Foundation, 2018; Poortinga & Whitaker, 2018). Sustainable products and services exist on the condition that the gained value does outweigh the cost (Lee et al., 2014). Under the current condition of the market, some companies can make profits over their eco-innovation cost in some programmes and take advantage of green products and services to build a pro-environmental brand image (Sasmita & Mohd Suki, 2015). In line with this green strategy, researchers start investigating how companies can advance their social and financial competitive advantage through eco-innovation as a cause of the escalation of sales (Scandelius & Cohen, 2016). However, the success of such a strategy bases on the premise of far-reaching environmental consciousness and the prevalence of corresponding actions among massive individual consumers, because sustainable companies require sustainable consumers and vice versa.

Table 1.1 Four fundamental explananda of marketing

Explananda	**Description**
First explananda	The behaviours of buyers directed at consummating exchanges
Second explananda	The behaviours of sellers directed at consummating exchanges
Third explananda	The institutional framework directed at consummating and/or facilitating exchanges
Fourth explananda	The consequences on society of the behaviours of buyers, the behaviours of sellers, and the institutional framework directed at consummating and/or facilitating exchanges

From the marketing perspective that is grounded in the theory of exchange (Alderson, 1957) and the four fundamental explananda of marketing (Hunt, 1983) (see Table 1.1), the purpose of sellers' behaviour is to provide products that can be sold (the second explananda), which means sustainable products and services can only exist when lots of buyers are asking for. Companies can only make profits from providing products and services that consumers can derive value to satisfy personal or organisational needs from the exchange. Therefore, it is not equitable to only ask the supply side to take the responsibility for sustainable consumption and production. Furthermore, the value and purpose of promoting sustainable

business are boosting the quality of life and general well-being of all consumers (Bahl et al., 2016). Regarding consumers, academia has endeavoured to shape pro-environmental social practices among them. For example, in the UK, some academics attempt to approach the government and influence policymaking through a different lens of a variety of academic disciplines, such as the Nexus Network (Cairns, Wilsdon, O' Donovan, 2017) and the Centre for the Evaluation of Complexity Across the Nexus (Sheate et al., 2016). Through these platforms, academics have contributed to forging sustainable practices by assisting policy-making.

Apart from the interdisciplinary coalition platforms, researchers, especially those in consumer psychology and marketing, have made considerable strides in making sustainable consumption more prevalent among individual consumers in the last two decades. Consumer psychologists apply psychologically-based behavioural theories and models to explain the attitudes and behaviours of consumers, such as the Theory of Reasoned Action (Ajzen & Fishbein, 1980) and the Theory of Planned Behaviour (Ajzen, 1985). For instance, a study applies the theory of reasoned action to argue that consumers with a high level of pro-environmental attitudes are more proportionally willing to pay for green products with environmental certification (Husted, Russo, Meza, & Tilleman, 2014). At the same time, other attitude-related factors, mainly ecological or environmental concern, environmental knowledge, and environmental awareness or consciousness, have been featured in many studies (Maniatis, 2016; Paço, Alves, Shiel, & Filho, 2013), which primarily investigate how these factors associate with or function as antecedents of pro-environmental attitudes (e.g., Aminrad, Zakariya, Hadi, & Sakari, 2013; Arcury, 1990; Bang, Ellinger, Hadjimarcou, & Traichal, 2000; Ogiemwonyi, Harun, Alam, & Othman, 2020).

To some extent, these theories can explain sustainable consumption and predict sustainable purchases. For instance, after incorporating perceived behavioural control into

the theory of reasoned action, the theory of planned behaviour has a better capacity to understand sustainable purchase intention and real sustainable purchase behaviour (Paul, Modi, & Patel, 2016). However, there is still much to learn from and beyond these theories, because, overall, the studies that are framed using these psychologically based behavioural theories are mainly restricted to the "attitude-behavioural gap" or the gap between attitude-related factors (e.g., environmental awareness) and behaviours (i.e., the behaviour is not adjusted in accordance with the attitudes or values) (Leonidou et al., 2010; Lunde, 2018; Perera et al., 2018). Namely, pro-environmental attitudes do not necessarily generate corresponding sustainable behaviour (Bamberg & Möser, 2007; Paço et al., 2019) and pro-environmental attitudes are not always the main reasons for those consumers who engage in sustainable consumption (Biswas, 2017; He, Cai, Deng, & Li, 2016).

Liquid consumption could be a prominent example to illustrate this attitude-behaviour gap. In the process of dematerialisation, liquid consumption is on the rise along with the appearance of sharing economy represented by home sharing (e.g., Airbnb) and ride-sharing (e.g., Uber). Liquid consumption is described as "ephemeral, access-based, and dematerialized", while solid consumption is described as "enduring, ownership-based, and material", and "liquid and solid consumption are conceptualized as existing on a spectrum" (Bardhi & Eckhardt, 2017, p.528). The intuitive motive to explain the rise of liquid consumption is pro-environmental consciousness or pro-environmental attitudes. Unfortunately, although many of these consumers are highly conscious of environmental issues and hold positive attitudes towards sustainable consumption and production, the main reasons account for liquid consumption are circumventing the burden of ownership (e.g., social risk and finance burden) and pursuing higher flexibility and fluidity in the background of fast-paced, globalised, and highly flowing society (Edbring, Lehner, & Mont, 2016; Schaefers, Lawson, & Kukar-Kinney, 2016). Besides these consumers who engage in

sustainable consumption, those who do not take actions responding to environmental challenges, are possibly still concerned about the environment and hold strong pro-environmental attitudes (Terlau & Hirsch, 2015; Young, Hwang, McDonald, & Oates, 2010).

Moreover, some empirical evidence shows that consumers do line up their ecological concerns and pro-environmental attitudes only when some prerequisites exist. There is evidence to suggest that many consumers only act sustainably when there are benefits from it (Naderi & Strutton, 2015). Meanwhile, other reports find that many consumers only line up with their ecological concerns and pro-environmental attitudes when there is no personal expense involved (Laroche, Tomiuk, Bergeron, & Barbaro-Forleo, 2002).

In short, the attitude-behaviour gap is one of the reasons to explain why the success rates of eco-innovation products are generally below 25% although there are tremendous endeavours from producers (e.g., Adams et al., 2016; Bossle et al., 2016; Hermundsdottir & Aspelund, 2021). It can also explain why the sustainable consumption movement has not been as successful as people anticipate in spite of substantial efforts (Evanschitzky, Eisend, Calantone, & Jiang, 2012). Sustainable consumption can always be a challenge until companies and governments can close this gap at the individual consumer level (Lunde, 2018). Therefore, new research is needed, then some researchers suggest building new psychological models and frameworks that can close this gap to some extent (Hensen et al., 2016; Paço et al., 2019). Other academics criticise that it is too voluntarism-inclined to focus on personal factors disproportionately while losing sight of structuralism (Halkier, Katz-Gerro, & Martens, 2011; Hampton & Adams, 2018). These researchers then propose to refer to other disciplines (e.g., sociology) to incorporate a broader view of the whole society (Burningham & Venn, 2017). Green purchase behaviours are highly situational and depend on a combination of personal, behavioural and contextual forces (Keenan, 2015), thus it is reasonable to combine insights both from voluntarism and structuralism by employing some

particular behaviour change techniques (i.e., priming) (Kasperbauer, 2017; Lehner, Mont, & Heiskanen, 2016).

1.2.2. Priming as a behavioural change technique

This section introduces the research status of priming in the sustainable consumption context. Priming has become a promising approach as an inexpensive and unobtrusive way of influencing individuals' decision-making in marketing and consumer psychology (Weingarten et al., 2016). For example, consumers primed with low-quality brand names (e.g., Wal-Mart) were more likely to shop for low-value products as opposed to consumers primed with high-quality brand names (e.g., Nordstrom) (Laran, Dalton, & Andrade, 2011). Priming is built on much research of behavioural science, particularly the burgeoning field of behavioural economics, which draws on psychology, and neuroscience, to be the 'descriptive' science of studying how humans make decisions (Hampton & Adams, 2018). The essential rationale underlying priming is moving beyond *homo economicus*, the traditional view argues that decision-making is solely driven by rational reflections (Kosters & Heijden, 2015). Rather, decision-making "is actually led by our very human, emotional, and fallible brain and influenced greatly by the context or environment within which many of our decisions are taken" (Vlaev, King, Dolan, & Darzi, 2016, p. 551). More recently, a more comprehensive understanding of human decision-making has been proposed progressively in the ways of bounded rationality, dual process model, and prospect theory, which formulate that human decision makings are systematically biased and erroneous led by a number of heuristics (Ariely, 2008; Cialdini, 2009; Kahneman, 2011; Kahneman & Tversky, 2013). In the case of priming, the primed stimulus is held unconsciously in associative memory and influences subsequent decisions and behaviour due to the availability heuristic (Momsen & Stoerk, 2014).

Table 1.2 Definitions of priming

Author	Definition
Sanyal (1992)	Priming refers to the process by which previous experience increases the general accessibility of a conceptual category, thereby increasing the likelihood of that category being used to encode new information
Bargh & Chartrand (1999)	Mental representations are activated in a subtle, unobtrusive manner in an earlier phase, and then, the unconscious, unintended effects of this activation are assessed in a subsequent phase
McNamara (2005)	An improvement in performance in a perceptual or cognitive task, relative to an appropriate baseline, produced by context or prior experience
Kristjánsson & Campana (2010)	Altered activation state of particular representations or associations in memory
Dolan et al. (2012)	Priming is a way to spark knowledge in memory, which makes it more accessible and therefore more influential in processing new stimuli
Janiszewski & Wyer (2014)	Priming is an experimental framework in which the processing of an initially encountered stimulus is shown to influence a response to a subsequently encountered stimulus. Priming occurs because the processing of the prime stimulus makes content, and the cognitive operations used to comprehend and manipulate this content, more accessible
Wilson et al. (2016)	Subconscious cues which may be physical, verbal or sensational, are changed to nudge a particular choice

Some major definitions of priming are shown in Table 1.2. Different definitions emphasise different aspects of priming. For instance, Kristjánsson and Campana's (2010) definition focuses on the mechanism of the priming effect, which is more definitional. On the other hand, McNamara's (2005) definition concentrates on the purpose or the result of priming, while Sanyal's (1992) definition is more procedural (i.e., describing the operation process of priming). Guided by these definitions, there is a need to create a more inclusive definition because none of the above definitions could provide a comprehensive understanding. I define priming as: *the interventions that involve presenting objects or stimuli within micro-environments or evoking prior experiences with minimal conscious engagement, which can activate one or more nodes in knowledge structure in associative memory, and improve the performance of a perceptual or cognitive task, relative to an appropriate baseline*.

Such interventions of presenting stimuli or evoking prior experiences are normally implemented within the same micro-environment as that in which the target tasks are

performed, typically require minimal conscious engagement, can in principle influence the behaviour of many people simultaneously, and are not targeted or tailored to specific individuals (Holland et al., 2013). It is worth noting that although the purpose of priming is to improve the performance of the target behaviour in accordance with the choice architect's intention, priming can also involve a change in performance that is neutral or poorer (e.g., *reactant response*) (Papies & Hamstra, 2010). Moreover, marketers may be confused about priming with subliminal messaging, which makes use of covert, rapidly presented stimuli. Priming per se is not necessarily unbeknownst to the individuals even if the priming effect occurs subconsciously.

This definition specifically signifies the concentration of priming on automatic processes, where minimal conscious involvement is obligate, but it does not mean the application of priming should exclude conscious and reflective processes (Vlaev et al., 2016). By contrast, conventional behaviour change techniques usually contain disseminating new information, which intends to change the way people think and subsequently transform their behaviours; And provide different incentives that seek to vary the consequences of decisions (Cecchini et al., 2010). One essence of these conventional tools is relying on reflective processes with moderate or high consciousness engagement in order to provide informed choices drawn upon the assumption that people transform their decisions and behaviours proportionately after conscious cognition is altered (Martin & DiMatteo, 2013). On the contrary, priming does not aim at changing individuals' conscious cognition but altering the micro-environments by lining up with the characteristics of automatic processes (Thaler & Sunstein, 2009).

Such a distinction between priming and conventional techniques is underpinned by a theoretical basis from behavioural science. The dual process model has been proposed as an important theoretical model to understand how humans behave and make decisions

(Stanovich & West, 2000; Lambe, O'reilly, Kelly, & Curristan, 2016; Spiliopoulos, 2018; Tversky & Kahneman, 1992). Principally, psychologists and neuroscientists have converged on a depiction of human brain functioning that is built on two forms of cognitive processes, also construed as two discrete systems (Hickson & Khemka, 2014; Reyna & Brainerd, 2011). The evolutionarily older 'System One' draws on associations that are acquired through experience, and it is referred to automatic, fast, effortless, associative, affective, and non-conscious, while 'System Two' draws on rules that are acquired through culture or formal learning, and it is described as controlled, reflective, effortful, slow, rule-based, and conscious thinking (Evans, 2008; Samson, & Voyer, 2012; Sherman, Gawronski, & Trope, 2014). The model is supported by substantial neurobiological evidence that there are separate neural substrates for these two systems (Fiske & Taylor, 2013). Drawn on the dual process model, priming takes advantage of human cognitive peculiarities or heuristics (system one) (Kahneman, 2011) to systematically trigger automatic decisions in accordance with societally beneficial direction (i.e., priming goes-with-the-grain of human nature, rather than aiming for transforming it) (Marteau, Hollands, & Fletcher, 2012).

Later research shows that 'System one' can be divided into two parts with different neural substrates (Glimcher & Fehr, 2013). The two parts are the impulsive system and habit system, which correspond to the mental processes of drives and emotions, and the mental processes of mental and motor habits respectively (Vlaev & Dolan, 2015). Reflective and rational thoughts are embodied in the goal-directed system (system two), in which the input-outcome contingencies are gauged and the consequences of the choice are rationally reasoned in order to bring about expected results. Regarding the habit system, through learning within a steady and predictable environment, a series of actions are assigned with values based on the positive or negative consequences of executing those actions (Orbell & Verplanken, 2010; Verplanken, Friborg, Wang, Trafimow, & Woolf, 2007). The habit system

not only engenders motor habits, but also generates mental habits (e.g., heuristics) (Orbell & Verplanken, 2010; Maio, Haddock, & Verplanken, 2018). As for the impulsive system, it associates stimuli (e.g., a person, environment, computers) to evolutionarily gained affective reactions (e.g., belonging, disgust, fear) (Rolls, 2013; Romer, Reyna, & Satterthwaite, 2017). Thus, stimuli are referred to as 'approach' or 'avoidance' as they spark inherent automatic affective reactions as well as the following behaviours. The impulsive system can also enhance or suppress how motor or mental habits manifest and how the goal-directed system reckons behavioural results (Gutnik, Hakimzada, Yoskowitz, & Patel, 2006). These three systems can generate different decision changes independently (Vlaev et al., 2016) (see Figure 1.1).

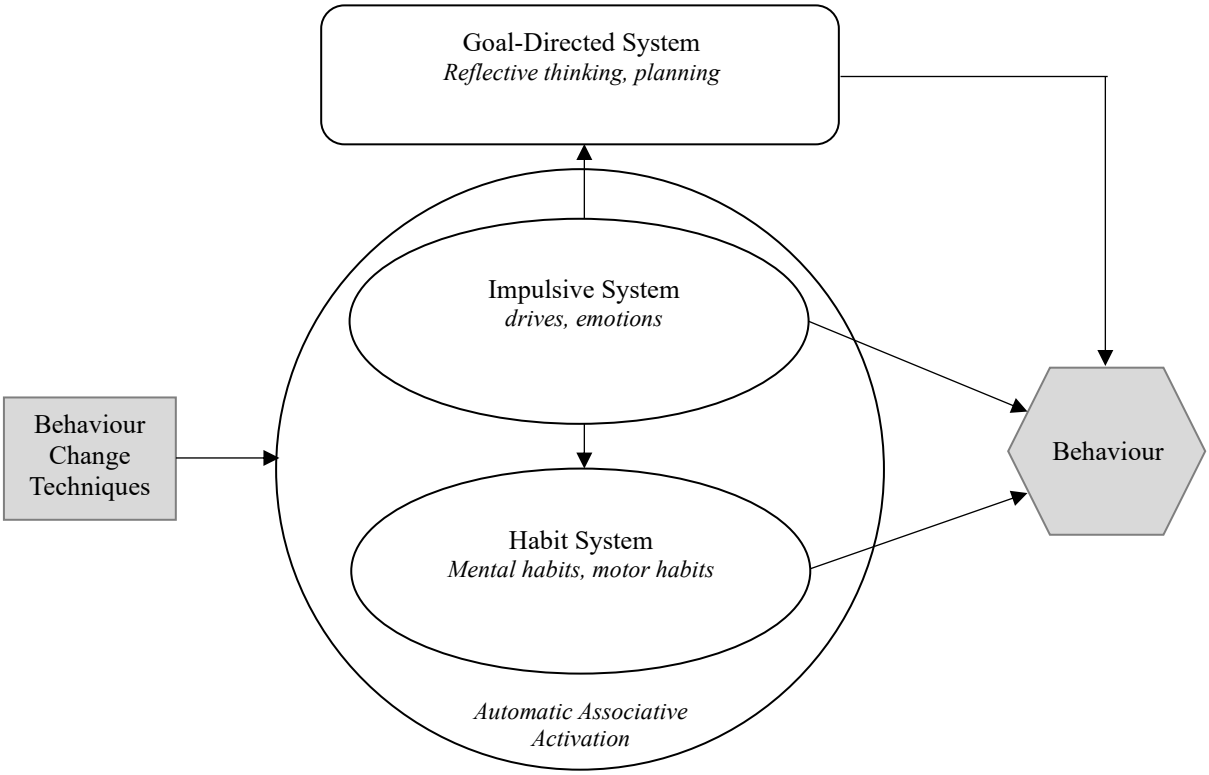


Figure 1.1 The three core brain systems for behavioural control (Vlaev et al., 2016)

As for the priming effect, it corresponds to the *habit system*. More specifically, a prime activates one or more nodes in memory that are associated with the prime, and then produces behavioural consequences based on the activated nodes (i.e., behavioural scripts). According

to the spreading activation theory (Quillian, 1967), when an individual responds to a perceptual or cognitive task, they are more likely to behave in accordance with the activated nodes, as opposed to non-activated nodes, in the target response. For example, if the morality prime is used, many nodes in one's memory associated with morality become activated (e.g., fair, compassionate, and honest). Then, when a primed individual is asked to distribute the money among the group including his/herself, the individual is more likely to contribute more money to the public account because words associated with morality are more active in the individual's mind (Aquino et al., 2009). As a result of knowledge activation's occurrence prior to exposure to the target, the spreading activation theory is said to be a prospective theory.

In what follows, this chapter introduces the motivations, aims, methods, and both theoretical and practical contributions of the three essays.

1.3. Three Essays on Priming: Motivation, Aims, Methods and Contributions

The three essays in this thesis examine the role of priming in promoting sustainable consumption. Essay one is titled "*Conceptualising Sustainable Consumption Priming: A Scoping Review*" and scans empirical research in the area and integrates scattered studies into a conceptual framework. Essays two and three focus on how priming could affect sustainable consumption in the context of aviation voluntary carbon offsets. Voluntary carbon offset in air travel is the empirical context of sustainable consumption in essays two and three, and the findings of essays two and three could be generalised to other contexts in future research. For instance, future research may conduct studies in the context of electric vehicles or fashion goods to test the role of psychological distance and motivated reasoning in sustainable consumption. The reasons why I choose aviation voluntary carbon offsets as

the empirical context are twofold. First, the carbon emissions from air travel contribute at least 8% to the global carbon footprint (Strauss & Cui, 2021), and it is predicted to increase by 300% by 2050 (Higham, Ellis, & Maclaurin, 2019). Second, the purchase rate of aviation voluntary carbon offsets is considerably lower than the awareness rate of it (c.f., Kim, Yun, Lee, & Ko, 2018; Lu, & Wang, 2018; Zhang, Ritchie, Mair, & Driml, 2019), and research suggests that the awareness of voluntary carbon offsets does not necessarily result in a purchase (Lee, Bae, & Kim, 2020; Ritchie, Sie, Gössling, & Dwyer, 2020). Essay two is titled "*Do We Need to Care about the Carbon Emissions from Flights? How Do Consumers Shift the Moral Burden away from Non-Sustainable Consumption*" and explains how and when priming makes consumers not willing to purchase voluntary carbon offsets. Essay three is titled "*Being Self-Accountable for Environmental Issues: The Role of Consumer Responsibilisation in Purchasing Airline Voluntary Carbon Offsets*" and examines how and when priming could empower consumers to internalise responsibility for protecting the environment and purchase voluntary carbon offsets. The rest of this section then summarises the motivation, aims, methods, main findings, and contributions of the three essays, and Table 1.3 provides an overview of the three essays.

Table 1.3 Summary of the three essays

	Essay one: ***Conceptualising Sustainable Consumption Priming: A Scoping Review***	**Essay two:** ***How Do Consumers Shift the Moral Burden away from Non-Sustainable Consumption***	**Essay three:** ***The Role of Consumer Responsibilisation in Purchasing Airline Voluntary Carbon Offsets***
Motivation	Studies about priming in sustainable consumption are fragmented and scattered, thus needing a comprehensive map	Previous research is not enough to promote the purchase of voluntary carbon offsets and cannot explain why consumers are not buying them	Consumer responsibilisation is gaining growing managerial and academic interest as a social process and practice to tackle public problems
Research aim(s)	To scan, examine and add insight into how priming is applied and evolves in the area To synthesise evidence, and map the general, theoretical, and methodological characteristics of existing studies	To identify a psychological process that could explain why consumers do not purchase voluntary carbon offsets and explore when they are more reluctant to purchase	To examine how priming could boost the purchase of voluntary carbon offsets by activating consumer responsibilisation
Methods	Scoping review including 74 papers published from 2000 to Sep. 2022	Three online behavioural experiments on Prolific	Three online pretests and four online behavioural experiments on Prolific
Main findings	The systematic map reveals general, theoretical, and methodological characteristics of studies about priming in sustainable consumption	Consumers have stronger motivations to justify their behaviour of taking a flight when they feel psychological-closely connected with a vacation by air, which negatively affects their purchase	Self-accountability priming could activate consumer environmental responsibilisation, which in turn increases anticipated guilt and the purchase of voluntary carbon offsets
Contributions	Providing a systematic map and delineating the research boundary of this area Developing new analytical approaches for mediators, moderators, and priming stimuli in this area Bringing about new research agendas building on the insights emerging from the review	Identifying a new perspective to promote the purchase of voluntary carbon offsets Testing cognitive self-serving justification quantitively in the sustainable consumption context	Identifying a new perspective to comprehend the promotion of voluntary carbon offsets Testing the role of consumer responsibilisation in sustainable consumption from a psychological standpoint quantitatively Developing a new priming approach for self-accountability priming

1.3.1. Essay one: Conceptualising sustainable consumption priming: a scoping review

The motivation for essay one lies in the considerable role that priming plays in promoting sustainable consumption (e.g., Costa Pinto et al., 2014; Weissmann, & Hock, 2022; Yan et al., 2021). There is growing empirical evidence suggesting that priming promises favourable pro-environmental effects (Sunstein & Thaler, 2003) and is potentially both effective and cost-efficient (Benartzi et al., 2017). Also, priming seems to be well accepted by the public in many areas, which makes it a practical choice for marketers and other stakeholders (Sunstein & Reisch, 2019). However, the literature on priming sustainable consumption is fragmented and scattered across different areas and various consumption contexts, which makes unclear the current research situation and research boundary of priming in sustainable consumption. It is challenging to embark on new research without knowing where prior researchers have reached and what they have found. Thus, it is necessary to create a review to delineate the research boundaries of this area and identify the variables that have been studied.

The aim of essay one is to scan, examine, and add insight into how priming is applied and evolves in the area of consumers' sustainable consumption, synthesise evidence, and map the general, theoretical, and methodological characteristics of existing studies. The essay, thus, adopts a scoping review approach to the review of this area. Scoping review is a relatively new approach and has become an increasingly popular approach for synthesising academic evidence (e.g., Daudt, van Mossel, & Scott, 2013; Liverpool-Tasaie et al., 2020; Puig-Barrachina et al., 2020). A scoping review can be particularly appropriate when the authors feel intrigued in identifying certain characteristics/concepts in the area, and mapping, reporting or discussing these characteristics (Munn et al., 2018). Compared with a systematic review, scoping review does not report study results, as this may encourage vote-counting. Instead, scoping review catalogues existing evidence, and it extracts and compiles relevant

descriptive information about the methods, contexts, and other characteristics based on predetermined coding criteria (Arksey & O'Malley, 2005). Then it produces knowledge clusters and identifies potential knowledge gaps following with future research agenda.

Through a comprehensive scoping review of 74 articles published between 2000 and September 2022, essay one delineates the general, theoretical, and methodological characteristics of the studies in the area. In terms of general characteristics, essay one reveals the distribution of the studies in time and geographical locations, features of participants sample, and consumption contexts of prior studies. As for theoretical characteristics, essay one catalogues the theories that have been applied, and synthesises contexts of priming, mediators, and moderators, which suggests that cognitive processes and corresponding boundary conditions are underexplored. Therefore, clarification is needed to explain when and how priming produces consistent or reactant responses. Regarding methodological characteristics, essay one summarises study methods, priming outcomes, and priming methods, as well as priming stimuli. Overall, essay one provides researchers with a conceptual framework that maps the research status and boundary of the area, which could inspire new research directions.

Essay one contributes to the literature by providing a comprehensive map and delineating the research boundary of this area. In this map, researchers could easily find what kind of priming outcomes, priming methods, and stimuli have been applied, what theories have been applied for describing, explaining, and predicting, and what factors have been studied in this area to explain the mechanism and boundary conditions of priming in promoting sustainable consumption. This map, thus, could help researchers find what is missing and what should be explored further. Furthermore, this essay develops new analytical approaches for mediators, moderators, and priming stimuli in this area, which helps researchers judge and evaluate the factors that have been studied before and explore

new factors to investigate in future research. Essay one also integrates different conceptualisation streams of priming together and provides a more comprehensive definition, and summarises the four constituents of priming (i.e., outcomes, methods, stimuli, and contexts of priming). At last, it brings about new research agendas building on the insights emerging from the scoping review.

1.3.2. Essay two: how do consumers shift the moral burden away from non-sustainable consumption

Building on essay one's comprehensive map and analysis of the consumption context, mechanism, and conditionality of priming in promoting sustainable consumption, essay two addresses the lack of exploration of the mechanism and conditionality of priming. To be specific, prior research is deficient to explain when and how priming produces consistent or reactant responses. Essay two is going to identify a process and corresponding boundary conditions to explain when and how priming produce reactant responses. With respect to the topic of how to encourage the purchase of voluntary carbon offsets, previous research loses sight of the decision process of why consumers generally are not intrigued by voluntary carbon offsets. Essay two provides insights into why the purchase rate of aviation voluntary carbon offsets is low (which is important but missing in prior research), and the psychological process through which consumers shift their moral burden away when they do not take responsibility for protecting the environment in consumption decisions.

The carbon emissions from air travel are considerable (Strauss & Cui, 2021). Airlines introduce voluntary carbon offsets to consumers, which ask consumers to pay an extra fee to offset their carbon emissions from flying. Yet, the purchase rate of aviation voluntary carbon offsets is low, with less than 10% of air passengers purchasing them (Zhang, Ritchie, Mair,

& Driml, 2019). Prior research mainly argues that consumers are not buying carbon offsets because they are not aware of this product (Denton, Chi, & Gursoy, 2020; Gössling et al., 2009; Lu & Shon, 2012). However, the purchase rate of aviation voluntary carbon offsets is significantly lower than the awareness rate of it (c.f., Kim, Yun, Lee, & Ko, 2018; Lu, & Wang, 2018; Zhang, Ritchie, Mair, & Driml, 2019). Therefore, previous research fails to explain why consumers do not purchase voluntary carbon offset even after being aware of this product. Essay two aims to answer this question by identifying a psychological process that can explain why and when consumers become reactant to purchase voluntary carbon offsets.

Essay two explores how psychological distance priming may interact with the environmental information of air travel to affect the level of motivated reasoning, which negatively influences the purchase of voluntary carbon offsets. By conducting three online experiments, essay two indicates that after being exposed to the information about negative consequences of air travel on the environment, consumers have stronger motivations to justify their behaviour of taking a flight when they feel psychological-closely connected with a vacation by air (study 1), and such motivation can negatively affect the purchase outcome of voluntary carbon offsets (study 2) and this negative effect may even diffuse to general pro-environmental behaviour (study 3).

Essay two contributes to the marketing literature on voluntary carbon offsets by elucidating how air passengers shift the moral burden away when they do not take responsibility for protecting the environment through purchasing voluntary carbon offsets. Specifically, after being presented with information about the detrimental impact of taking a flight on the environment, consumers who feel psychological-closely connected with a vacation by air would have a stronger motivation to justify their behaviour of taking flights (i.e., motivated reasoning), which shifts their moral burden away from protecting the

environment. This exploration helps researchers investigate how to spur the purchase of aviation voluntary carbon offsets from a new perspective. For example, research shows that cognitive load may decrease the motivation of moral-related justification and reasoning (Paharia, Vohs, & Deshpandé, 2013).

Furthermore, this essay also contributes to the literature on morality. Previous research in moral regulation was integrated as the moral self-regulation framework (Sachdeva, Iliev, & Medin, 2009), which suggests that individuals rely on moral cleansing to restore decreased moral self-worth. Nonetheless, people could attenuate the threats toward moral self-concept through cognitive self-serving justifications alone without counting on any behaviour (Shalvi, Gino, Barkan, & Ayal, 2015). However, this idea has not been widely tested in consumer psychology, especially in the sustainable consumption area. Prior research either investigated how consumers justify their environmental-unfriendly consumption through past and current deeds (e.g., Barr, Shaw, Coles, & Prillwitz, 2010), or studied consumers' justifications qualitatively (e.g., Árnadóttir, Czepkiewicz, & Heinonen, 2021; Juvan, Ring, Leisch, & Dolnicar, 2016). On the contrary, essay two quantitatively tests the idea of defending moral self-concept through pure cognitive self-serving justification in the sustainable consumption area, and how it affects consumers' purchase decision-making.

1.3.3. Essay three: the role of consumer responsibilisation in purchasing airline voluntary carbon offsets

After exploring how and when priming may restrain the purchase of voluntary carbon offsets, essay three is going to explore a psychological process through which priming could aid consumers to behave sustainably (i.e., consistent response), which is internalising the responsibility for protecting the environment (i.e., consumer responsibilisation). The

motivation for essay three is the growing managerial and academic research interest in consumer responsibilisation as a social process and practice to deal with public problems (e.g., global warming and income inequality). Consumer responsibilisation is conceptualised as a governmental process with four constituents: personalisation, authorisation, capabilisation, and transformation (Giesler & Veresiu, 2014). This P.A.C.T. process *personalises* focal social problems as issues of individual desires and choices (e.g., global warming issues); *authorises* scientific knowledge to legitimate the responsible consumer subjectivity (e.g., economic, psychological, and other scientific expert knowledge); *capabilises* a market with sustainable products, services, technologies, and support systems (e.g., sustainable products and carbon footprint tracking system); and, finally, *transforms* consumers into enlightened moral agents who take responsibility of particular social problems and try to solve them through individual decision making (e.g., recycling) (Giesler & Veresiu, 2014). Consumer researchers are gaining more interest in delineating how consumers engage in the responsibilisation process confronting public problems including global warming (e.g., Cherrier & Türe, 2022; Eckhardt & Dobscha, 2019; Pellandini-Simányi & Conte, 2021; Thompson & Kumar, 2021).

The aim of essay three is to examine how priming could boost the purchase of voluntary carbon offsets by activating consumer responsibilisation. Specifically, the essay examines how self-accountability priming could activate environmental responsibilisation, which in turn increases the anticipated guilt of not counterbalancing carbon emissions and the purchase of voluntary carbon offsets. Through three online pretests and four online experiments, the essay shows that self-accountability priming could strengthen consumer environmental responsibilisation, especially for those with relatively higher biospheric value. Consumers with stronger environmental responsibilisation would have higher levels of anticipated guilt, especially when the airline has higher perceived environmental CSR. And

last, consumers with higher anticipated guilt would be more likely to purchase voluntary carbon offsets, especially when the carbon offset project is perceived as relative-highly credible.

Essay three offers several important contributions to the literature. First, the essay identifies a new perspective to comprehend and scrutinise the promotion of aviation voluntary carbon offsets. Voluntary carbon offsets transfer some responsibility of containing carbon emissions to air travellers, thus this research returns to this origin and tries to identify a feasible approach to encouraging consumers to take responsibility for their carbon emissions. Based on the logic of neoliberal logic and conscious capitalism, consumers are supposed to take responsibility for environmental problems, especially when corporates initiate environmental CSR projects (Eckhardt & Dobscha, 2019; Lemke, 2015). The essay advocates this logic by identifying an approach to empower consumers involved in the process of responsibilisation, delineating the psychological process of such an approach, and by differentiating various situations and conditions where this approach may have different levels of effectiveness.

Second, essay three contributes to the literature on consumer responsibilisation, too. The theory of consumer responsibilisation (Giesler & Veresiu, 2014) explicates consumer responsibilisation as a governmental process underpinned by sociology theoretical streams. Previous marketing research, thus, qualitatively observes (e.g., ethnographic study and interview) the results of such a process (e.g., Cherrier & Türe, 2022; Eckhardt & Dobscha, 2019). On the contrary, in essay three, consumer responsibilisation is treated as the starting point of a decision-making process and as a psychological status rather than a result of a long-term governmental process. Through four online experiments, participants are triggered into a responsibilised status by self-accountability priming, through which essay three quantitatively delineates the role of environmental responsibilisation in the decision process

of voluntary carbon offsets.

Third, the essay makes a methodological contribution to the literature on self-accountability by providing a goal-priming design of self-accountability. Self-accountability is defined as "a person's desire to live up to internal self-standards" (Peloza et al., 2013, p.105). Consistent with this definition, prior research uses the semantic priming outcome to implement self-accountability priming (e.g., Peloza et al., 2013; Tran & Paparoidamis, 2021). Essay three tests a new self-accountability priming approach by employing the goal priming outcome. Semantic priming is a cognitive priming outcome that presents a set of interrelated concepts to activate associative nodes in the memory (Hutchison, 2003). Whereas goal priming is a behavioural priming outcome that encourages individuals to pursue a specific goal (Papies, 2016), and in the self-accountability context, to pursue a goal of staying tight with personal standards.

2. Chapter Two: Essay One - Conceptualising Sustainable Consumption Priming: A Scoping Review

Abstract

While many marketing interventions attempt to encourage sustainable consumption intentions by altering attitudes, these are not always successful because consumers may not follow through on attitudes due to a variety of factors. Thus, many researchers in psychology, marketing, and consumer research have explored using alternative strategies, such as priming, to aid consumers to achieve their attitudes. In general, *priming* strategies use stimuli that trigger non-conscious processing that has been shown to influence sustainable decisions. Despite the popularity of these strategies, this literature is dispersed and scattered across different areas, which provides the rationale for this paper. Through a comprehensive scoping review of 74 articles published between 2000 and September 2022, this paper unpacks and summarises different approaches to priming sustainable behaviour by delineating theoretical and methodological perspectives in various contexts with a variety of consumer characteristics. The resulting framework provides both a current overview of sustainable consumption priming research and also points to important missing insights that form a research agenda for future investigations.

Keywords Priming, sustainable consumption, pro-environmental behaviour, scoping review

2.1. Introduction

Organisations are expected to meet the challenge posed by the climate crisis (de Ruyter et al., 2021) by applying psychological approaches to their future marketing strategies that encourage sustainable consumption (e.g., Ek Styvén & Mariani, 2020; White, Habib, & Hardisty, 2019). While there are many successful marketing interventions that directly attempt to alter explicit attitudes (e.g., Funk, Sütterlin, & Siegrist, 2021; Röös, Ekelund, & Tjärnemo, 2014), there is often a gulf between sustainable consumption attitudes and observed behaviours (Lunde, 2018; Paço, Shiel, & Alves, 2019). Hence, a non-conscious approach to behaviour change that does not focus on changing attitudes, *priming*, is considered an important alternative approach to encouraging sustainable consumption (e.g., Costa Pinto, Herter, Rossi, & Borges, 2014; Weissmann, & Hock, 2022; Yan, Keh, & Wang, 2021). Priming focuses on designing consumption contexts and environments over persuasive communication (Thaler & Sunstein, 2009). In general, a sustainable prime is a low-intrusion approach to steer consumers' behaviour in the desired direction by non-consciously activating pro-environmental concepts or goals.

While research into priming strategies is promising in promoting sustainable behaviour (c.f., White et al., 2019; Minton, Cornwell, & Kahle, 2017; Weissmann, & Hock, 2022), the sustainable consumption priming literature is dispersed with inconsistent findings across consumption contexts. For example, research indicates that pro-environmental attitudes (Tate, Stewart, & Daly, 2014), power distance beliefs (Yan et al., 2021), or different genres of atmospheric music (Huang & Labroo, 2020) can have magnifying or attenuating impacts on the effectiveness of sustainable consumption priming. However, a review examining priming in sustainable consumption as a set of integrated systems and analysing frameworks or spectrum is currently missing. Thus, this article addresses this deficiency by systematically examining priming in sustainable consumption and consolidates insights in a

comprehensive framework across consumption contexts.

Applying the scoping review methodology (Peters et al., 2015), this article summarises the conceptualisations and research characteristics of 74 empirical articles to generate an overview of sustainable consumption priming strategies. This overview illustrates how sustainable consumption priming research has been examined using different theoretical and empirical approaches. This endeavour offers a conceptual contribution by integrating research characteristics across studies to showcase similarities in processing mechanisms, and also differentiating results depending on contextual boundary conditions. The resulting framework presents a useful starting line for future research into the application of priming strategies by marketers to encourage sustainable consumer behaviours.

2.2. Background

As environmental challenges, such as climate change, have been leading to more extreme weather events, reducing biodiversity, and in many ways threatening our current way of living (O'Neill et al., 2017), the sustainable development goal has been introduced and promoted (United Nations, 2015). One important way to constrain climate change is to decrease carbon emissions by promoting sustainable consumption among individual consumers, as daily consumption by consumers put considerable pressure on the environment. For instance, in the UK, over one-third of carbon emissions come from individuals' consumption (DEFRA, 2005; 2017). Together with households' daily emissions (e.g., heating, and lighting), it could account for 45% of total domestic emissions (DEFRA, 2017). A recent global environmental footprint study singled out air travel and food consumption as well as heating and cooling as the most impactful consumption areas (Ivanova, 2018).

Apart from normal consumption, challenges come from waste and recycling as well. In

the developed world, the single biggest source of food waste is consumers (Priefer, Jörissen, & Bräutigam, 2016). In the US, for instance, 0.28 kg of food is wasted per day per capita, which could have been avoided with more sustainable shopping habits (Thyberg & Tonjes, 2016). As for recycling, a representative case is coffee cups. In the Netherlands, at least 85 million recyclable coffee cups were burned instead of recycled in view of inappropriate waste separation (Scheffer, 2020). These findings support the research backing up pro-environmental publicity towards consumers and confirm the necessity and importance of mitigating environmental pressure by intervening in consumers' daily behaviour.

To promote sustainable consumption among individual consumers, many behavioural change interventions to promote sustainable consumption have been adopted. Examples of promising interventions include many, such as the use of positive models (Funk et al., 2020) and pro-environmental awareness communication campaigns (Röös et al., 2014). Most of these conventional interventions have relied on attitude change as a route to behaviour modification (Dolan, et al, 2012; Lunde, 2018). However, the behaviour often is mismatched with attitudes (Davies et al., 2020; Paço et al., 2019). Many empirical studies have asserted that pro-environmental attitudes do not necessarily generate corresponding sustainable behaviour (Hensen, Keeling, de Ruyter, & Wetzels, 2016; Kaiser, Hübner, & Bogner, 2005). Therefore, another behavioural change technique that does not focus on changing attitudes, *priming*, is considered a crucial alternative behavioural intervention to promoting sustainability (e.g., Costa Pinto et al., 2014; Weissmann, & Hock, 2022)

2.3. A Primer on Priming Strategies

Priming is built on much research of behavioural science, particularly the burgeoning field of behavioural economics, which draws on psychology and neuroscience, to be the 'descriptive' science of studying how humans make decisions (Hampton & Adams, 2018).

Specifically, consumers' decisions are systematically guided by biases (e.g., mental accounting), influenced by environments and surroundings (e.g., odour), and often employ simple heuristics (e.g., availability) (Ariely, 2008; Kahneman & Tversky, 2013). In the case of priming in sustainable consumption, the primed stimulus is held unconsciously in associative memory and influences subsequent decisions because of the availability heuristic (Momsen & Stoerk, 2014). Examples of priming methods are perceptual priming and conceptual priming (see Table 3). All of these aim to make the desirable choice easier and timelier, and therewith more possible and more often to happen.

Based on the working mechanism of priming discussed above, researchers have suggested different definitions of priming (see Table 2.1). Definitions in Table 2.1 are categorised based on which aspect of priming it emphasises. For instance, one definition focuses on the mechanism of the priming effect, which is more cognitive-focused (Kristjánsson & Campana, 2010), while another definition is more outcome-focused (i.e., emphasises the outcome of priming) (Wilson et al., 2016). Guided by these definitions, there is a need to create a more inclusive definition because none of the above definitions could provide a comprehensive understanding. The definition of priming offered in this study is *the interventions that involve presenting objects or stimuli within micro-environments or evoking prior experiences with minimal conscious engagement, which can activate one or more nodes in knowledge structure in associative memory, and improve the performance of a perceptual or cognitive task, relative to an appropriate baseline*. Such interventions of evoking prior experiences are normally implemented within the same micro-environment as that in which the target tasks are performed, typically require minimal conscious engagement, and can in principle influence the behaviour of many people simultaneously (Holland et al., 2013). It is worth noting that although the purpose of priming is to improve the performance of the target behaviour, priming can also involve a change in performance that is neutral or poorer (e.g., *reactant response*) (Papies & Hamstra, 2010). Moreover,

marketers may be confused about priming with subliminal messaging, which makes use of covert, rapidly presented stimuli. Priming per se is not necessarily unbeknownst to the individuals even if the priming effect occurs subconsciously.

Table 2.1 Definitions of priming

Focus	Definition	Author
Cognitive focus	Priming refers to the process by which previous experience increases the general accessibility of a conceptual category, thereby increasing the likelihood of that category being used to encode new information.	Sanyal (1992)
	Mental representations are activated in a subtle, unobtrusive manner in an earlier phase, and then, the unconscious, unintended effects of this activation are assessed in a subsequent phase.	Bargh & Chartrand (1999)
	Altered activation state of particular representations or associations in memory.	Kristjánsson & Campana (2010)
	Priming is a way to spark knowledge in memory, which makes it more accessible and therefore more influential in processing new stimuli.	Dolan et al. (2012)
Outcome focus	An improvement in performance in a perceptual or cognitive task, relative to an appropriate baseline, produced by context or prior experience.	McNamara (2005)
	Subconscious cues which may be physical, verbal or sensational, are changed to nudge a particular choice.	Wilson et al. (2016)
Holistic focus	Priming is an experimental framework in which the processing of an initially encountered stimulus is shown to influence a response to a subsequently encountered stimulus. Priming occurs because the processing of the prime stimulus makes content, and the cognitive operations used to comprehend and manipulate this content, more accessible.	Janiszewski & Wyer (2014)

According to the tri-component ABC model of attitudes (Breckler, 1984), priming intervention can be categorised as three priming outcomes: affective, behavioural, and cognitive (Minton et al., 2017). Table 2.2 provides more details about the priming outcomes, as well as sub-outcomes. The affective priming aims to prime specific affective states or emotions (Raska & Nichols, 2012). Behavioural priming tends to prime an action tendency, for example, procedural priming primes a process for actions (Tong et al., 2011) and goal priming leads actions consistent with goal attainment (Papies & Hamstra, 2010). Cognitive priming are not conducted to activate an emotion or behavioural inclination, rather cognitive priming prime cognitive concepts, for instance, category priming makes concepts of categories more accessible from memory by presenting exemplars of a category (Kawakami

et al., 2012).

Table 2.2 Priming outcomes

Priming outcome	**Description**	**Example**
Affective priming	Affective symbol or stimuli (e.g., red hearts), corresponds to an affective concept (e.g., love).	Love priming (red heart symbols) leads to more healthy foods versus sexual love priming (red kisses symbols) (Raska & Nichols, 2012).
Behavioural priming		
- Goal priming	Activating the end-goal states and encouraging a specific goal.	Consumers eat less red meat when primed with health goals (Papies & Hamstra, 2010).
- Procedural priming	Prime procedural knowledge (e.g., if-then statements) rather than declarative knowledge (e.g., serial strings).	Priming consumers to use cost-benefit analysis can promote a rational mindset (Tong et al., 2011).
Cognitive priming		
- Category priming	Prime with exemplars of a category, that category tends to be temporarily more accessible within associative memory.	Priming social categories (e.g., hippies) could increase associations between the self and the target category (Kawakami et al., 2012).
- Associative priming	Associative priming corresponds to connections developed in the mind that are not necessarily semantically related.	Consumers make different purchase choices when primed with monetary or non-monetary related stimuli (Liu et al., 2012).
- Semantic priming	Respond to a semantically-related stimulus quicker (e.g., cat-dog) versus an unrelated stimulus (e.g., table-dog).	Consumers' brand reactions were more positive for congruent stimuli (Galli & Gorn, 2011).

However, there are still some notable points. First, please note that while priming outcomes can be classified into these three foci, it is misleading to assert that individuals are purely affectively primed or cognitively primed. Primes can be both affective and cognitive in nature, but under the affective priming condition, the affective component is particularly prominent (Musch & Klauer, 2003; Storbeck & Clore, 2008). Behavioural priming also contains cognitive or affective elements (Korzeniewska et al., 2020; Loersch & Payne, 2011). As such, when it comes to the cognitive and affective elements of priming, the classifications should be viewed as relative rather than absolute. Second, in cognitive priming, semantic and associative priming are often used interchangeably (Lucas, 2000). However, semantic priming results from direct semantic relation, whereas associative

priming results from common relations developed in the mind that are not necessarily semantically related (McNamara, 2005). For instance, a “dog” is only semantically connected to a “wolf”, while a golden retriever is both semantically and associatively related to a “dog” (Lucas, 2000).

Table 2.3 Priming methods

Priming method	Description	Example
Conceptual priming	Primes can alter the processing of the meaning of a conceptually related stimulus.	Primed with prestige concepts gave higher ratings to prestige products (Chartrand et al., 2008).
Repetition priming	The more often the stimulus is presented, the more efficient processing of the stimulus.	Children consume more snacks as repetitions of the product (Matthes & Naderer, 2015).
Perceptual priming	Perceptual priming focuses on the form of the stimulus, such as fill-in-the-blank (e.g., “d_ct_r” for “doctor”).	Consumers recognise the brand category better after being primed with fill-in-the-blank primes of brand names (Lee, 2002).
Contextual priming	Environmental cueing in the targeted environment. It could be a conversation among surrounding people.	Consumers using cafeteria trays (contextual prime) have higher evaluations of the digital music player when they were also exposed to the music slogans focusing on dining trays (Berger & Fitzsimons, 2008).
Masked priming	Masked priming presents a prime for a very short time (e.g., 50ms) followed immediately by the target. The prime is “masked” in the sense due to the short time of presentation.	A masked prime of the word “frog” make consumers prefer wine that featured a frog (Labroo et al., 2008)

The taxonomy of priming outcomes is based on priming outcomes and processes. To produce a priming outcome, priming outcomes need to be partnered with a variety of priming methods (see Table 2.3). Priming methods are the specific operationalised methods to implement priming interventions, and one kind of priming outcome can be realised by different methods. For instance, a goal priming could apply conceptual or contextual methods to achieve. Specifically, in terms of conceptual priming, by presenting a paragraph about what are called for consumers to do for protecting the environment, participants could be primed with the pro-environmental goal then they are more inclined to choose eco-friendly products (Tate et al., 2014). Regarding contextual priming, a sustainable goal might be primed by a conversation among surrounding people.

2.4. Method

The application of scoping review is emerging in marketing and other social science disciplines (e.g., Campbell, Parent, Plangger, & Fulgoni, 2011; Deroover, Siegrist, Brain, McIntyre, & Bucher, 2021; Fowler & Thomas, 2023; Makris, Khaliq, & Perkins, 2021; Norsworthy, Jackson, & Dimmock, 2021). Scoping review has become an increasingly popular approach for synthesising academic evidence and is usually conducted for different purposes with a systematic review (see Table 2.4) (e.g., Daudt, van Mossel, & Scott, 2013; Liverpool-Tasie et al., 2020; Puig-Barrachina et al., 2020). Generally, a systematic review is conducted to address a more specific or focused topic, such as assessing the effectiveness of an intervention (Arksey & O'Malley, 2005) or establishing the quality of evidence (Munn et al., 2018). By contrast, a scoping review intends to present a descriptive overview of a large and diverse body for a broad topic (Arksey & O'Malley, 2005), to clarify definitions and conceptual boundaries of a topic (Davis, Drey, & Gould, 2009), or to examine how research is conducted on a certain topic (Munn et al., 2018). Hence, in scoping reviews, a formal assessment of the methodological quality of the included studies is generally not performed, and the action of synthesis in not always undertaken (Peters et al., 2015)

If the researchers have a question addressing the appropriateness or effectiveness of a certain treatment or practice, then it is likely to be the most valid to choose a systematic review approach (Pearson, Wiechula, Court, & Lockwood, 2005). However, researchers do not always wish to ask such single or definite questions about the effectiveness and may be more interested in the identification of certain characteristics in an area, and the mapping of research boundaries, reporting or discussion of characteristics. In these cases, a scoping review is more appropriate than a systematic review (Munn et al., 2018).

Table 2.4 The differences between systematic review and scoping review

	Systematic review	Scoping review
Purpose & aim	• To answer more specific/focused questions (e.g., assess the effectiveness of an intervention) (Higgins et al., 2019) • Confirm current practices, assess the effectiveness of interventions, and identify new practices (Arksey & O'Malley, 2005; Munn et al., 2018) • Establish the quality of evidence, to address any uncertainty or variation in practices (Munn et al., 2018) • Identify and investigate conflicting results (Munn et al., 2018) • Produce statements to guide decision-making (Munn et al., 2018)	• To address relatively broader research questions (e.g., map a body of literature to a topic) (Arksey & O'Malley, 2005) • Present an overview of a large and diverse body for a broad topic (Arksey & O'Malley, 2005) • Commonly used a 'reconnaissance' – to clarify definitions and conceptual boundaries of a topic (Davis et al., 2009) • Determine what range of evidence (quantitative and/or qualitative) is available on a topic (Peters et al., 2015) • Determine the value of undertaking a full systematic review (Levac et al., 2010) • To identify the types of available evidence in a given field (Munn et al., 2018) • To examine how research is conducted on a certain topic (Munn et al., 2018)
Process	• Follow a structured and pre-defined process, rigorous, transparent, systematic (DiCenso et al., 2010)	• Follow a structured and pre-defined process, rigorous, transparent, systematic (DiCenso et al., 2010)
Method	• Collate empirical evidence from a relatively smaller number of literature (Arksey & O'Malley, 2005) • Often focus on randomized controlled trials (Arksey & O'Malley, 2005) • The activity of synthesis is actively undertaken (Peters et al., 2015) • Access the quality of studies included (Munn et al., 2018)	• Collate empirical evidence from a relatively greater range of study designs and methodologies (Pham et al., 2014) • Represent the evidence visually as a mapping or charting of the located data (Arksey & O'Malley, 2005) • The act of synthesis is not highly undertaken (Peters et al., 2015) • A formal assessment of methodological quality is generally not performed (Peters et al., 2015)
Nature	• A synthesis of evidence from studies assessed for risk of bias (Higgins et al., 2019)	• A descriptive overview or map for a topic without critically appraising individual studies (Pham et al., 2014)

Besides research purposes, a scoping review is different from a systematic review regarding methods (Munn et al., 2018; Pham et al., 2014). Compared with a systematic review, they are similar with respect to a structured and pre-defined process, which is rigorous, transparent, and systematic (DiCenso et al., 2010). In contrast to the systematic review, a scoping review has looser selection criteria and concentrates on a broader range of literature without assessing the quality of literature, not estimating the effectiveness of interventions or comparing effect size (Haddaway et al., 2017). Moreover, scoping review

does not even report study results, as this may encourage vote counting. Instead, scoping review catalogues existing evidence, extracts compiles and presents relevant descriptive information in maps, charts, and tables about the methods, contexts, and other characteristics, based on predetermined coding criteria. Then it produces knowledge clusters and identifies potential knowledge gaps following with future research agenda. To sum up, a scoping review normally aims to answer broader questions (Arksey & O'Malley, 2005), with a lower level of synthesis (Peters et al., 2015), is more descriptive (Pham et al., 2014), collates empirical evidence from a relatively greater range of literature (Pham et al., 2014), represent evidence visually as a mapping or charting (Arksey & O'Malley, 2005), and can be a precursor to a systematic review (Munn et al., 2018).

This thesis aims to map the existing literature in the field of priming sustainable consumption, examine the volume, extent, and range of this area across different consumption contexts and map the general, theoretical, and methodological characteristics of this area, rather than critically appraising and synthesising a specific answer to a particular effectiveness question. Thus, a scoping review approach is employed for this article. The methodology for this scoping review is based on the standard framework for scoping evidence synthesis from the Joanna Briggs Institute (JBI), University of Adelaide (Peters et al., 2015), as well as the framework created by Arksey and O'Malley (2005) then modified by Levac et al. (2010). The review contains the following five key phases: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) extracting and charting the data, and (5) collating, summarising, and reporting the results of the scoping review.

2.4.1. Protocol

Before starting the search, a protocol was settled. In the protocol, the research

objective, research questions, study eligibility criteria, review framework and process, information source and search strategy, as well as data extraction plan were predetermined. Then, the whole search, as well as the screening and coding process is guided by the protocol. Throughout the study, the process deviated slightly from the protocol, namely with respect to the search plan and the coding scheme. Thus, the protocol was finetuned in an iterative manner while searching and coding the studies accordingly where needed. A detailed review protocol can be obtained in Appendix A.

2.4.2. Research question

The review is guided by the overall research question about what are the research status and boundaries of priming sustainable consumption, which can be deconstructed as the following questions: What kind of priming outcomes have been studied in the area of individual consumers' sustainable purchasing intention and behaviour? What theories have been applied for describing, explaining, and predicting how pro-environmental priming influences consumers' sustainable purchasing intention and behaviour? What factors have been studied in this area as moderators, mediators, or other variables in terms of pro-environmental priming? What research gaps exist?

2.4.3. Data sources & search strategy

The search strategy began by selecting relevant terms that are used in the sustainable consumption priming literature that have been finetuned iteratively during the search process. These terms were paired together to form search strings that encompassed "green," "sustainable," "environmental," or "ethical" combined with "priming," "prime," or "primed." The publication temporal range is from January 2000 to September 2022, and we

limited the search to only English-language publications. The databases were selected to be comprehensive and to cover the primary relevant disciplines (e.g., marketing, psychology, and behavioural science).

The core search was performed in the above databases that were chosen based on the assumed relevance for the research questions. The library subscription of King's College London and the University of London was used. The search information and restrictions can be found in Table 2.5. The search restrictions were set to be the title, title or abstract, everywhere except full text according to the available features of each database.

Table 2.5 Bibliographic databases and search information

No.	Database	Platform	Search restrictions
1	Academic Search Complete	Ebsco	Title or abstract
2	Applied Social Sciences Index and Abstracts	ProQuest	Everywhere except full text
3	Business Source Complete	Ebsco	Title or abstract
4	Google Scholar	Google Scholar	Title
5	JSTOR ebooks and journals	JSTOR	Title or abstract
6	PsycEXTRA (APA)	Ebsco	Title or abstract
7	Sage Journals Online	SAGE	Title or abstract
8	SCOPUS	Elsevier	Everywhere except full text

2.4.4. Eligibility screening & inclusion criteria

All search results were downloaded as reference files and assembled as an electronic library using the desktop version of Endnote X9. After removing duplicates both within each database and across databases, a two-stage screening process is conducted to screen references. The first stage is at the title and abstract level and then at a full-text level. The screening process is depicted in Figure 2.1.

The first level (title and abstract) screenings were conducted by two reviewers independently by an iterative sample process. After manually removing any duplicates, 50 randomly selected records were chosen as the sample. Two reviewers carefully read each

title and abstract, and then, make the decision independently based on predetermined inclusion and exclusion criteria.

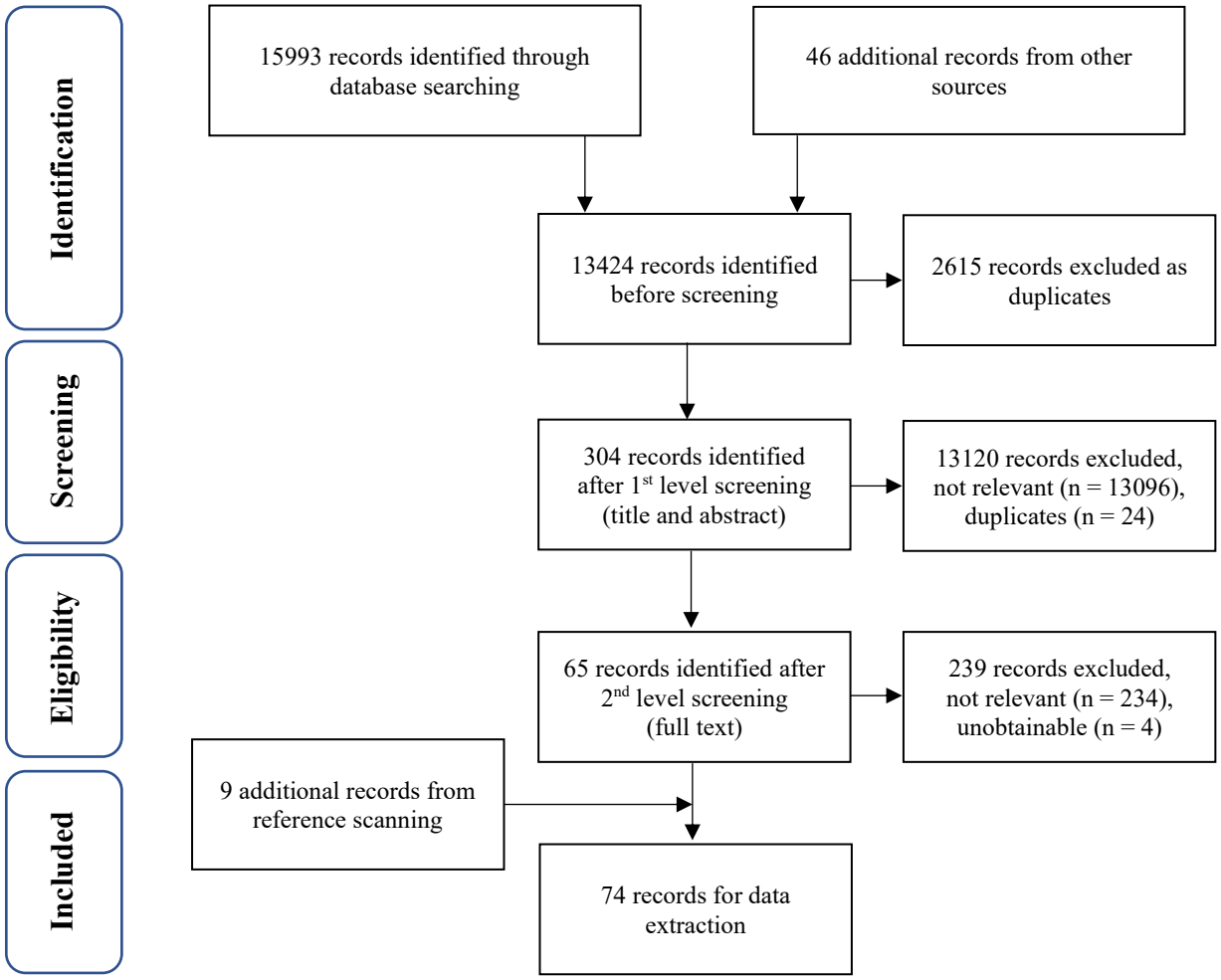


Figure 2.1 Flowchart of the study selection process

Subsequently, the screening results of the sample were compared between the two reviewers. The inter-rater agreement is 86% (Cohen's Kappa = .146; PRL = 85). The two reviewers discussed all disagreements in team meetings and bridged the different understandings of inclusion and exclusion criteria and jointly made decisions on all disagreed records. Then the second sample with 50 randomly selected records was tested in the same process with 94% inter-rater agreement (Cohen's Kappa = .37; PRL = 94) as a result. After the discussion of all disagreements in the second sample, the third sample with 100 randomly selected records was tested, which resulted in a 96% inter-rater agreement

(Cohen's Kappa = .579; PRL = 96). The remaining records were screened by the author team.

Table 2.6 Inclusion & exclusion criteria

Criteria	Relevant-included	Irrelevant-excluded	Examples of inclusion
Population	Individual consumers with any social identities.	Group consumers such as organisations.	Undergraduates patronise the cafeteria.
Intervention	Priming in sustainable consumption field.	Salience in sustainable consumption.	Contextual priming encourages more public transportation.
Comparator	Control group or before-after comparison.	Research does not indicate the comparison in the outcome.	Two groups with and without priming were applied.
Outcome	Intentional & behavioural responses for purchase.	Studies focus on post-purchase responses.	Primed consumers may waste less food.
Motivation	Increase eco-friendly or decrease eco-harmful consumption.	Studies about pollution or social governance.	A study investigates the mechanism of sustainable consumption priming.
Relevance	All kinds of empirical studies.	Papers that do not provide primary data or conceptual statements.	An experimental study with necessary data.

At the full-text level, two independent reviewers repeat the same three-sample process, but this time the sample size is 20, 20, and 30, respectively. The inter-rater agreement is 95% (Cohen's Kappa = .773; PRL = 95), 90% (Cohen's Kappa = .444; PRL = 89), 96.6% (Cohen's Kappa = .651; PRL = 96.6) respectively. Then the remaining records were screened by the author team. After the full-text level screening, 65 papers were identified, and finally, the reference list of these papers and the papers that cited these 65 papers (in Google Scholar) were scanned and 9 more were added. During the screening and selection process, the predetermined inclusion and exclusion criteria were followed (Table 2.6). The two reviewers discussed all disagreements of both levels of screening in team meetings and bridged the different understanding of inclusion and exclusion criteria and jointly made decisions on all disagreed records.

After completing the screening stage, all 74 papers (containing 115 studies) were coded and analysed as full texts according to the protocol. Ten records were coded by the

second reviewer to minimise extraction errors and ensure consistency. All disagreements were discussed, after which, the author conducted the second-round data extraction and coding process to keep accuracy.

2.5. Results

2.5.1. General characteristics

The general characteristics of the papers can be seen in Table 2.7. Records are published between January 2000 and September 2022, with 74.3% (55/74) published after 2015. As for the geographical distribution of the 115 studies, most studies are conducted in the US (around 39%) and Europe (around 36%) (see Figure 2.2). In Asia, China, Japan, and South Korea also paid some attention to the application of priming to promote sustainable consumption. Some research suggests that priming may work differently in different social or cultural contexts (Gruneau Brulin et al., 2018; Na & Kitayama, 2012). Thus, more studies outside the US and Europe might be needed in future.

As for the sample, considerable variations of sample size between the studies are found, with 16 participants being the smallest sample and 5,300 participants the highest (mean: 328; median:192). In most studies, the sample size does not exceed 200, with the majority of the studies with a sample size between 100 and 200 (29.6%), and the second most is less than 100 (22.6%). The source of participants varies considerably across the studies. As is also shown in Figure 2.3, the vast majority of the studies recruited general consumers (54.8%) or university undergraduates (37.4%) as participants.

Table 2.7 General characteristics of selected papers & studies

Characteristic	Number (n = 115)	Percentage
Publication year (papers n = 74)		
2000 - 2005	1	1.4%
2006 - 2010	2	2.7%
2011 - 2015	16	21.6%
2016 - 2022	55	74.3%
Country		
US	45	39.1%
Australia	11	9.5%
China	8	7%
Netherland	8	7%
UK	7	6.1%
Other	36	31.3%
Sample size		
< 100	26	22.6%
100 - 199	34	29.6%
200 - 299	22	19.1%
300 - 499	15	13%
> 500	18	15.7%
Consumption context		
Food	64	55.6%
Saving & Recycling	11	9.6%
Home durables	11	9.6%
Other	29	25.2%

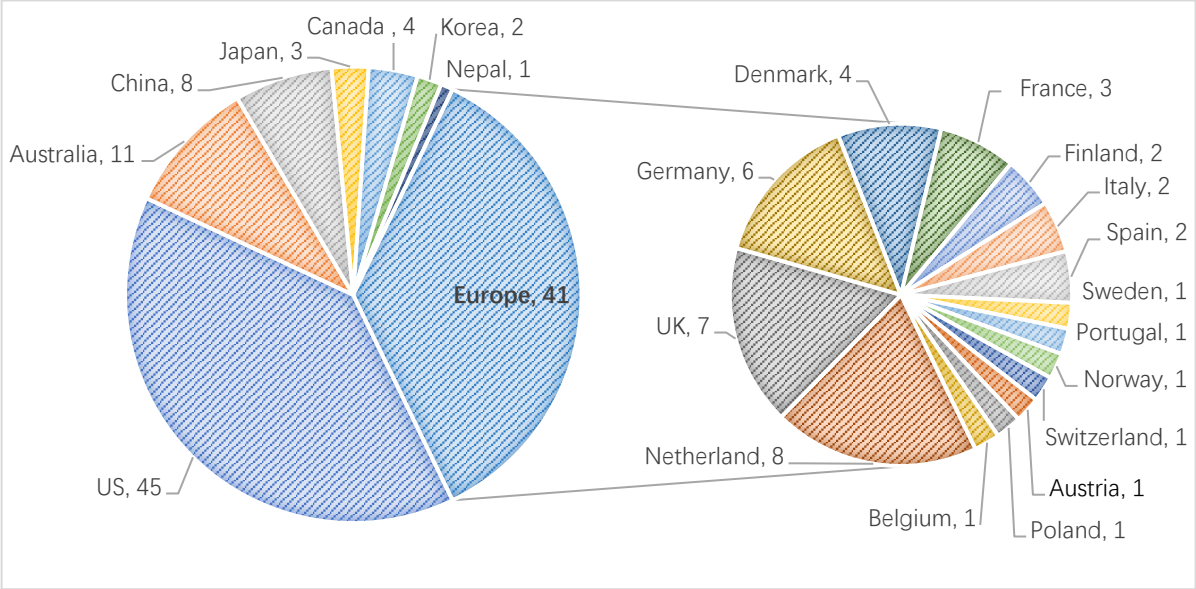


Figure 2.2 Chart of geographical distribution

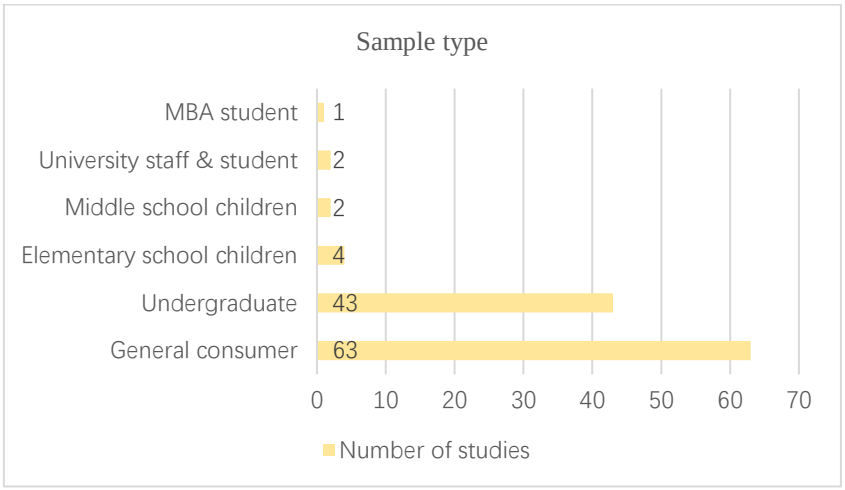
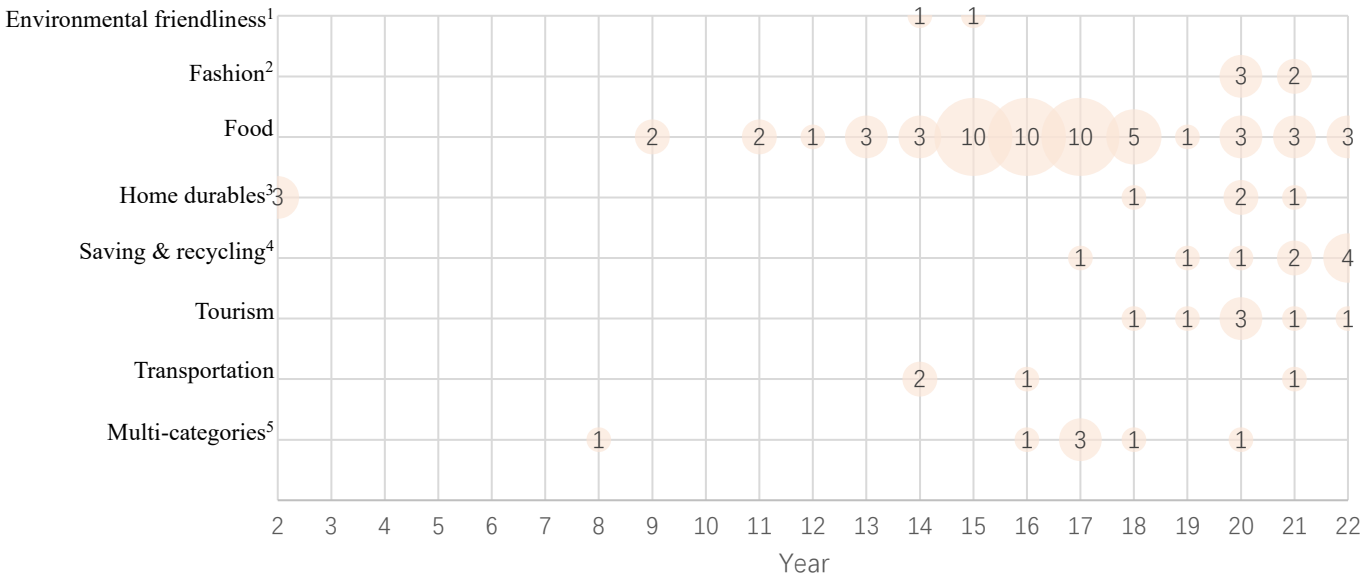


Figure 2.3 Bar chart of the sample population



Notes: [1]Environmental friendliness of packages or products; [2]Including clothing and luxury; [3]such as electronic products; [4]electricity saving or recycling; [5]products across different categories

Figure 2.4 Bubble plot of studies by year and context

This scoping review synthesises evidence for various markets or consumption contexts, and Table 2.7 shows that prior research disproportionately focuses on food context, with 55.6% (64/115) of the studies investigating environmental-friendly food consumption. As we want to know whether the research focus has changed, shifted, and evolved between different consumption contexts, the information on the year and consumption context are combined at the same time (see Figure 2.4). The bubble chart not only points out the

academic concentration on food-related research, but also illustrates the contagion of academic attention from food-related research to other markets since 2015, such as tourism, home durables, and the fashion industry. Meanwhile, the popularity of applying priming to promote sustainable food consumption peaked in 2015 and lasted until 2017, then it drops drastically.

The market or context sometimes plays an important role in behaviour change research. For example, a recent study shows that individuals with less financial knowledge are more inclined to be affected by different nudges when making annuity and pension decisions, in which financial knowledge is a specific factor in the context of the 'annuity and pension' (Mrkva et al., 2021). Regarding sustainable consumption priming, whether consumers are restrained eaters or not influences the effectiveness of priming in the food market but it seems not effective for electronic products (Harris, Bargh, & Brownell, 2009). If researchers are keen on some robust factors that are essential across different contexts or feel intrigued about some context-specific factors, they should consider the range of applications for different factors. It seems that some researchers have already noticed this issue and since 2015 several studies are occurring in the multi-category context and other consumption contexts rather than just food consumption (see Figure 2.4).

2.5.2. Theoretical characteristics

All papers are coded for research purposes including three categories: theoretical purpose only, practical purpose only, and both purposes (see Table 2.8). To elucidate in more detail, typical practical purposes are found to be quite specific, such as exploring if changing the information format can make consumers would like to pay more for sustainable hotels (Kim et al., 2021). Meantime, typical theoretical purpose usually entails theory development (e.g., "uncovering new motivational origins of priming effects") (Luomala, Hellén, &

Jokitalo, 2018), mechanism investigation (e.g., "to investigate the mechanism of pro-environmental goal priming") (Tate, et al., 2014), or the exploration of boundary conditions (e.g., "to investigate the boundary conditions that drive materialists' purchase intention of sustainable over generic luxury products") (Talukdar & Yu, 2020).

Table 2.8 Theoretical characteristics of selected papers

Characteristic	**Number (*n* = 115)**	**Percentage**
Purpose (papers *n* = 74)		
Theoretical only	13	17.6%
Practical only	54	73%
Both purposes	7	9.4%
Theory base (papers *n* = 74)		
Prospect theory (Kahneman & Tversky, 1979)	7	9.5%
Spreading activation theory (Quillian, 1967)	5	6.7%
Goal conflict model (Stroebe et al., 2013)	3	4%
Other	21	28.4%
No theory applied	38	51.4%
Priming contexts (as IV)		
Sustainable priming	37	32.1%
Health priming	24	20.9%
Other	54	47%
Mediator	25	21.7%
Moderator	77	67%

Approximately three-fourths (54/74) of the selected papers were conducted only for practical purposes. Among the remaining papers, 17.6% of them (13/74) only entail a theoretical purpose, while only 9.4% of papers (7/74) have both theoretical and practical purposes. The result suggests a concentration of research in a practical lens but a lack of endeavour with respect to a theoretical strength. This point can be also observed by the analysis of theory application. Among these 74 papers, less than half of them (48.6%; 36/74) have a theoretical discussion or have applied a theory or theoretical model and framework to underpin hypothesis development, and 51.4% (38/74) of the papers purely assessed the usefulness of priming without elaborative theory deliberation. However, while there is only 21.7% (25/115) of studies contain mediators, 67% (77/115) of the studies investigate at least

one moderator, which implies some extent of incremental theoretical exploration.

As for the theories and frameworks used to support hypotheses development, 27 theories or frameworks have been identified. These 27 theories or frameworks are all behavioural and psychological theories concentrating on different aspects of sustainable consumption, and after iterative differentiation and integration, 13 theory themes are identified from 27 theories (see Table 2.9). These 13 theory themes describe and predict individuals' behaviour from different lenses, based on which, they are categorised into four categories based on these aspects: *external cognition, value & goal, self-cognition*, and *disposition & idiosyncrasy* accordingly. About 30% (8/27) of theories discuss how consumers' *external cognition* (e.g., psychological distance) could influence sustainable consumption and these theories have been used 16 times (37.2%; 16/43). To take an example from this category, in the theme of psychological distance theories, the construal level theory (Trope & Liberman, 2003) illustrates how different construal levels affect consumers' tendency to purchase sustainable products (Goldsmith, Roux, & Wilson, 2020).

Theory themes categorised in *value and goal* pay attention to how consumers' values and goal could influence their motivation to practice sustainable consumption. For example, in the theme of value theories, the costly signalling theory (Bird & Smith, 2005) illustrates some consumers' needs to signalling status by purchasing costly products (conspicuous purchases), which could be applied to promote sustainable consumption if marketers make sustainable products expensive and easily visible to other people (Talukdar & Yu, 2020). In terms of the category of *self-cognition*, theories emphasise how consumers' self-perceptions and self-requirements could be applied in priming sustainable consumption, while theories in the category of *disposition and idiosyncrasy*, point out the importance of personal traits (e.g., behavioural inhibition system). Table 2.9 summarises the theory description, application, and extension in priming sustainable consumption.

Table 2.9 Research on sustainable consumption: theoretical lens and selected research

Theory Themes	Used Times	Theories Included	Theory Description	Theory Use in Research	Theory Remarks	Example Citations
			External Cognition			
Loss Aversion Theories	8	Prospect theory (Kahneman & Tversky, 1979) Psychological reactance theory (Brehm, 1966)	These theories indicate that consumers are more sensitive to loss generally than gain and are resistant to the loss of autonomy.	Studies assess whether priming is more effective than those explicit ones and whether the frame of gain and loss can affect the effectiveness of priming.	Findings extend the theories through the context of sustainability. Sustainability priming can be more powerful if it matches consumers' cognition characteristics.	Kim et al. (2021).
Psychological Distance Theories	3	Temporal construal theory (Liberman & Trope, 1998) Construal level theory (Trope & Liberman, 2003)	Competing motivations evolve and change over time with relatively low-level construal ones that are more concrete and may go beyond others.	The connection strength between cognitive nodes, as well as the construal level, can be primed to influence subsequent consumption decisions.	The research extends the theories by providing a possible mechanism of priming and helping explore the reason for the unstable effect of priming.	Goldsmith et al. (2020).
Attitude Theories	3	Fazio's attitude theory (Fazio, 1995) Balance theory (Heider, 1958)	The associative strength between attitude and object, as well as the attitudinal im/balance between different related objects, influence decisions.	The attitudinal imbalance status that restrains sustainable purchase could be changed to a balance status by priming.	Literature suggests that making attitudes more accessible or changing the attitudinal imbalance between related units can be realised by priming.	Danner & Thøgersen. (2022).
Information-Validation Theories	2	Affect-as-information theory (Schwarz & Clore, 1983) Self-validation theory (Brinol & Petty, 2022)	Consumers appraise and validate information based on valence and relevance.	Priming is applied to change the validation of information to promote sustainable purchases.	Research emphasises the valence and relevance of the information provided to consumers.	De Bauw et al. (2022).

Continued

Theory Themes	Used Times	Theories Included	Theory Description	Theory Use in Research	Theory Remarks	Example Citations
			Value & Goal			
Goal Conflict & Compatible Theories	8	Goal conflict model (Stroebe et al., 2013) Goal compatibility framework (Markman & Brendl, 2000) Dual motivation model (Gibbons et al., 1998) Goal framing theory (Lindenberg & Steg, 2013) Regulatory focus theory (Higgins, 1997)	These theories assert that consumers have several goals that are competing and emphasise that priming could change the competing status between goals.	Sustainability priming theoretically could strengthen the competitiveness of pro-environmental goals. However, the effect is not 100% reassured.	Research emphasises the competition between goals and helps explain the mechanism of goal priming. However, the theories cannot explain why sometimes goal priming cannot work.	Thøgersen and Alfinito (2020).
Value Theories	5	Value theory (Schwartz, 1992) Costly signalling theory (Bird & Smith, 2005) Goal theory (Kruglanski et al., 2002) Self-determination theory (Deci & Ryan, 1985)	These theories suggest that individuals have some stable and sustaining values and motivations, which could shape long-term behaviour.	Priming that is aligned with innate or sustaining values and motivations can affect consumers more and may even have a spillover effect.	Findings emphasise that values can not only be activated by external cues but also can be regarded as sustaining traits. Priming can be more effective when it is aligned with specific values.	Talukdar and Yu (2020).

Continued

Theory Themes	Used Times	Theories Included	Theory Description	Theory Use in Research	Theory Remarks	Example Citations
			Self-Cognition			
Self-Standards Theories	3	Self-consistency theory (Stone & Cooper, 2001) Moral identity theory (Aquino & Reed, 2002) Self-standards theory (Baumeister, Stillwell, and Heatherton, 1994)	Individuals tend to behave in accordance with (be consistent) their self-standards of morality and competence.	It investigates whether lifting self-standards would increase the attractiveness of products from the ethical appeal.	Literature brings the concept of morality into sustainability and makes consumers' self-accountability an essential status of sustainable consumption.	Peloza et al. (2013).
Social Class Theories	2	Optimal distinctiveness theory (Brewer, 1991) Social-cognitive theory of social class (Kraus et al., 2012)	Individuals with different social class identities have different cognition patterns and require different balance statuses of assimilating and differentiating within and between social groups and identities.	Primed with different social classes, consumers could respond to sustainable options differently due to different levels of assimilating and differentiating motivations.	Research brings a broader view of sustainable consumption into the area. Consumers' preferences toward sustainable consumption are embedded into social classes.	Yan et al. (2021).
Social Comparison Theory	1	Social comparison theory (Festinger, 1954)	Consumers treat others as a reference point to compare with themselves, and to reduce the uncertainty of self-evaluations.	Primed with a specific goal, consumers are inclined to make opposite choices for others compared with themselves due to the reference point.	Social comparison is also existing in the sustainable consumption area. The progress of pursuing a sustainable goal depends on the social reference point.	Bryksina. (2020).
Self-Perception Theory	1	Self-perception theory (Bem, 1972)	Individuals highly rely on their previous behaviour to form their attitudes.	Using priming interventions to cue consumers with their previous eco-friendly behaviour may change their attitudes towards sustainable products.	This research brings the theory into sustainability by adding a temporal dimension regarding pro-environmental attitudes formation from the spillover effect of prior behaviour.	Cornelissen et al. (2008).

Continued

Theory Themes	Used Times	Theories Included	Theory Description	Theory Use in Research	Theory Remarks	Example Citations
			Disposition & Idiosyncrasy			
Biopsychological Theory of Personality	1	Biopsychological theory of personality (Gray, 1970)	There are two brain-based systems for controlling people's interactions with the environment: the behavioural inhibition system (BIS) and the behavioural activation system (BAS).	This research studies whether the approach of motivational orientation (BAS/BIS) would moderate the effect of priming on sustainable behaviour.	It applies the theory in priming and considers consumers' behavioural innate features, which could help explain why the effect of priming is not stable.	Wang et al. (2017).
Depletion Model	1	Depletion model (Muraven, Tice, & Baumeister, 1998)	People have limited strength or energy to regulate themselves. Once the resource is used, individuals become depleted.	It tests whether the depletion status could influence the effect of priming.	It finds priming only affects non-depleted consumers, which could help explain why the effect of priming is not stable.	Walsh (2014).
			Other			
Spreading Activation Theory[13]	5	Spreading activation theory (Quillian, 1967)	A prime activates related nodes in memory then individuals tend to use activated nodes in the target response.	This theory has been applied to explain why priming can work.	This theory is applied to elucidate the mechanism of priming in sustainable consumption.	Stockli et al. (2016).

Table 2.10 The classification of mediators

Classification	Description	Used Times	Factors	Example Citations
Behaviour	Conation and behaviour factors are directly observable rather than latent.	5	Information acquisition behaviour; Response time; Visual attention (eye-tracking); Number of new ideas; Idea originality.	Fukawa (2016); van der Laan et al. (2017).
External Perception	Consumers' perception of products, brands etc.	8	Brand image; Hotel image; Perceived attribute importance; Perceived functional value; Environmental attitude; Service evaluation; Consideration of future; Consumption openness.	Tanford et al. (2020); Talukdar and Yu (2020).
Motivation	Relatively sustaining motivational factors that drive consumers to behave.	9	Hedonic willingness[1]; Health consciousness; Approach/reactane[2]; Pro-environmental self-accountability[3]; Prosocial focus[4]; Inspiration; Mood; Dual motivation for assimilation and differentiation; Moral self-perception.	Wang and Zhang (2016); Wu et al. (2018).
Cognitive Processing	The aspects or the easiness of cognitive processing towards products can change.	2	Evaluative readiness[5]; Accessibility of fullness.	Tate et al. (2014).

Notes: [1.] An unintentional or impulsive motivation for instant attraction; [2.] The motivational strength of approach or reactance to a stimulus; [3.] One's desire to live up to his or her internal self-standards; [4.] A prosocial focus prioritises others' welfare and future interests; [5.] The automatic evaluation of an object is contingent on the object's utility to goal attainment.

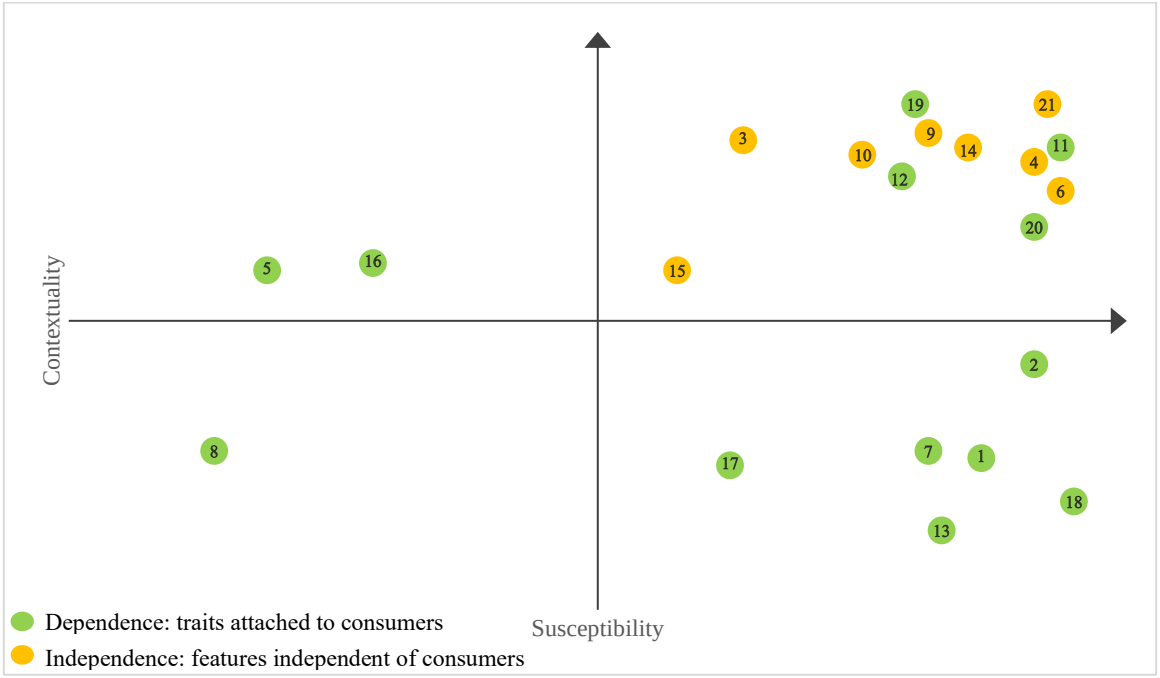
As for the independent variables studied, sustainable priming and health priming emerge as the two main contexts (see Table 2.8), while other priming contexts are rarely studied, such as self-accountability priming and power priming. There are 24 mediators found from 25 studies during the coding and analysis (see Table 2.10). Based on their attributes, these factors are iteratively differentiated and integrated then they are divided into four categories: *behaviour, external perception, motivation*, and *cognitive processing*. Factors in the category of *behaviour* refer to those behaviour indicators that can be measured or observed directedly (e.g., response time). *External perception* corresponds to consumers' perception of outside entities such as brand and product function. Nine mediators are classified as *motivation*, which is the category with the most mediators, while there are only

two factors classified as *cognitive processing*.

Seventy-four moderators are identified from 77 studies. Some conceptually related moderators are grouped into clusters (see Appendix B). For example, the *green signal* includes the green logo on fashion products, organic labelling on foods, and environmental publicity information in virtual stores. Through differentiation and integration, they are grouped into 23 moderator clusters. All 23 clusters are analysed in two ways. Firstly, during the process of review, it is noted that some moderators are easy to be manipulated (e.g., the gain/loss frame), while some others are not that easy to manipulate (e.g., value centrality). Meanwhile, some moderators such as dieting orientation are specific to food context while some other are not that context-specific like dieting orientation. To explore to what extent previous-studied moderators are relatively easy to manipulate and context-specific, they are located in a 2×2×2 scatter plot, in which the vertical axis refers to the susceptibility (i.e., the extent of instability and the easiness to be manipulated), while the horizontal axis represents contextuality (i.e., the extent of generic effect across consumption contexts), and the colour represents the dependence/independence of the factor toward consumers. For instance, moral identity is much more stable than dispositional mindfulness, dieting orientation is much more context-specific than moral identity, and moral identity is dependent on consumers while the product attributes are independent of consumers.

This analysis method may help marketers apply priming strategies. Some consumer-dependence moderators can be treated as criteria to segment different consumers (e.g., consumers with high vs. low moral identity), while for consumer-independence moderators, marketers can manipulate them based on their needs (e.g., change product attributes). However, it is worth noting that, not all consumer-dependence moderators could be treated as the criteria of segmentation because the essence of consumer-dependence moderators is the characteristics or status of consumers, which marketers cannot manipulate or influence for certain. On the contrary, consumer-independence moderators like a green signal or

product attributes can be manipulated by marketers easily. Regarding contextuality, moderators with high contextuality are supposed to work in different consumption contexts, thus these factors could be useful for marketers from different industries. Moderators with low contextuality are expected to be effective in a small number of consumption contexts. For example, dieting orientation might be useful only in a food context. At last, highly-susceptible moderators may be easily manipulated by single advertising, while low-susceptible moderators may be hardly changed by marketers only in a short time (e.g., ethical mindset).



Notes: *Demographics* (incl. gender and the number of dependents) and *time slots* (morning or afternoon) are not shown in the figure because they are just plain descriptive information. Specifications of moderator clusters 1 to 21 can be found in Appendix B.

Figure 2.5 Bubble plot of moderators by susceptibility, contextuality and dependence/independence

To assess these factors on these three dimensions, three raters evaluate each of these factors independently on a 9-point Likert scale (from 1 -not contextually generic at all- to 9 -very contextually generic; from 1 -not susceptible at all- to 9 -very susceptible), resulting in excellent reliability on contextuality (ICC = .935 average measure, $p < .01$), and good reliability on susceptibility (ICC = .875 average measure, $p < .01$) based on an absolute-

agreement, two-way mixed model. The final location of each factor is decided by the mean of all three raters' results. The top of the vertical axis means very high susceptibility (i.e., very susceptible) while the right of the horizontal axis means very high contextuality (i.e., very contextually generic). The dependence/independence of these clusters is discussed by all three raters till reaching a consensus.

Figure 2.5 provides an overview of all the moderator clusters that have been studied in the area and indicates the nature and quality of these factors. To sum up, when exploring possible moderation effects of priming in sustainable consumption, current research keeps an acceptable balance between susceptible and unsusceptible factors but pays more attention to high-contextual factors. However, it is worth noting that, many of these studies were conducted in a single market context (see Table 2.7 and Figure 2.4), hence, the contextuality of these moderators has not been empirically tested. As for the dependence/independence dimension, when studying consumer-independence moderators, current research loses sight of low contextuality or low susceptibility factors, which could be addressed in future studies.

The second analysis examines these moderation factors as similar to what has been done to mediators. Based on the different aspects of these moderator clusters, they are classified into five categories after differentiation and integration (see Table 2.11): *behaviour, external perception, motivation, personal traits*, and *cognitive processing*. Factors in *behaviour* correspond to actual behaviour during the study or what has happened before. Consumers' perception of external entities (e.g., *external perception*) accounts for the largest percentage of moderation factors, such as the frame of gains and losses. *Motivation* corresponds to consumers' sustaining motivational orientations, such as the nature of the behavioural approach system, while *personal traits* refer to idiosyncratic characteristics, and it is the category with the second most moderators. Factors in *cognitive processing* describe the status of consumers' cognition.

Table 2.11 Classification of moderator clusters

Classification	Description	Used Times	Factors	Example Citations
Behaviour	Consumers' current and past behavioural factors.	2	Dieting orientation; Habit attribute.	Luomala et al. (2018); Ohtomo, (2017).
External Perception	Consumers' perception of products, contextual stimuli, product-related traits etc.	11	Green signal; Product attribute; Cost; Message attribute; Framing; Psychological attribute; Review valence; Guilt appeal; Time slot; Psychological stress; Microenvironment.	Hahnel et al. (2014); Tanford et al. (2020).
Motivation	Relatively sustaining motivational factors that drive consumers to behave.	3	Pro-environmental orientation; Motivational orientation; Ethical mindset.	Bauer and Menrad, (2020); Tate et al. (2014).
Personal Traits	Consumers' dispositional and relatively sustaining characteristics.	5	Demographic; Physiological status; Health knowledge; Mindfulness; Moral identity.	Campbell et al. (2016); Forwood et al. (2015).
Cognitive Processing	Cognitive status or inclination.	2	Cognitive load; Attributed motivation.	Forwood et al. (2015); Karmarkar and Bollinger (2015).

2.5.3. Methodological characteristics

The summary of methodological characteristics is shown in Table 2.12. While the sample contained some field studies and empirical analysis, the vast majority of the 115 studies applied experimental methods with slightly more than half done in the lab (n = 53) and the others conducted online (n = 45). In terms of the priming outcome, the majority of studies adopt either semantic priming (47%; 54/115) or goal priming (25.2%; 29/115). As for the priming method, over 80% of studies apply either conceptual priming (63.5%; 73/115) or perceptual priming (20%; 23/115). At last, there are 123 priming stimuli identified in the extraction. Image (17.9%; 22/123) and imagination (17.9%; 22/123) are the two dominant stimulus types.

Table 2.12 Methodological characteristics of selected studies

Characteristic	Number (*n* = 115)	Percentage
Study method		
Lab experiment	53	46.1%
Online experiment	45	39.1%
Field study	16	13.9%
Empirical analysis	1	0.9%
Priming outcome		
Semantic priming	54	47%
Goal priming	29	25.2%
Associative priming	20	17.4%
Affective priming	7	6.1%
Category priming	5	4.3%
Priming method		
Conceptual priming	73	63.5%
Perceptual priming	23	20%
Contextual priming	18	15.6%
Repetition priming	1	0.9%
Priming stimuli (n = 123)[1]		
Image	22	17.9%
Text	22	17.9%
Imagination	18	14.6%
Writing task	12	9.8%
Video	7	5.7%
Other	42	34.1%

Notes: [1.] The total number of priming stimuli is 123 some studies apply more than one stimulus.

Table 2.13 Deconstructing priming stimuli

		Engagement		
		Low	Medium	High
Sensory Richness	Low	Auditory[1]; Banner (present); Image (present); Odour; Poster; Slogan; Product option[2]; Online post; Eco-label; text (present).	Image (evaluate)[3]; Image (search)[4]; Questionnaire[5]; Text (crossing out); Text (scrambled sentence); Text (thematic categorising); Text (word search puzzles); Value ranking[6].	Imagination[7]; Writing[8].
	Medium	Verbal and graphical ads.	Menu (scan & read); Recipe (scan & read).	Image (answer)[9].
	High	Video (watch).	Contextual items (plate & bowl); Food sample[10]; Video (evaluate); Product evaluation.	Lecture; Workshop; Presentation (interactive).

Notes: Specifications of marked priming stimuli forms can be found in Appendix C.

These 123 priming stimuli are integrated into 32 forms, which entail different sensory

richness and require a different level of behavioural or cognitive engagement (see Table 2.13). Stimuli differ in *sensory richness* in two ways. Firstly, it varies in one sensory dimension. For instance, letting participants watch videos or pictures is both visual stimulations, but apparently, videos are richer than pictures. The second way is the difference between uni-sensory and multi-sensory stimuli. For example, verbal and graphical ads encompass both auditory and visual stimulation while odour only contains olfactory stimulation. Meanwhile, *engagement* also comprises two aspects: behavioural and cognitive. For example, cognitive engagement is embedded more in imagination while scenario writing involves more behavioural engagement. Table 2.13 summarises that most priming stimuli employed in these studies have medium engagement levels and low sensory richness levels.

2.5.4. The overview of reviewed materials

In order to provide a clearer overview of all reviewed papers, all 74 papers are listed below in Table 2.14 with key information presented. These papers are categorised based on the consumption context (see Figure 2.4). It is worth noting that some papers consist of more than one study with different consumption contexts, thus a paper may occur in more than one consumption context. The key information in Table 2.14 extracted from these papers are four kinds of variables (independent variable, mediator, moderator, and dependent variable), as well as the different priming (outcome, method, and stimulus).

It is clear that prior research mainly focuses on priming sustainable consumption in food context, which is also shown in Table 2.7 and Figure 2.4. The contexts of priming studied as independent variables in these papers are disproportionately health priming and sustainable priming (see Table 2.8 & 2.14), which means that other contexts are generally underexplored, such as self-accountability priming (Peloza et al., 2013). Furthermore, as shown in Table 2.14, the exploration of mediators is deficient, and according to Table 2.10,

the process of priming in promoting sustainable consumption is not sufficiently studied. Moderators and dependent variables are presented in Table 2.14 as well for reference. Together with Table 2.11, the majority of moderators studied in prior research can be classified into External perception (e.g., review valence) and personal trait (e.g., moral identity).

Moreover, the characteristics of priming are shown in Table 2.14. Combined with Table 2.12 and Table 2.13, the main priming outcomes employed are semantic priming and goal priming, while the main priming methods are conceptual priming and perceptual priming. As shown in Table 2.12 and Table 2.14, the main priming stimuli are image, text, and imagination, and these stimuli entail different levels of engagement and sensory richness (see Table 2.13).

Grounded on these findings, this review brings about four main contributions. First, this scoping review delineates the research boundary of the area. In this review, general, theoretical, and methodological characteristics are delineated. Second, this review brings to bear new approaches to analyse prior research in this area, such as the 'contextuality', 'susceptibility', and 'dependence/independence' dimensions when analysing moderation factors, and 'sensory richness' and 'engagement' when thinking about priming stimuli. Third, it integrates different conceptualisation streams of priming together and provides a more comprehensive definition and summarises the four constituents of priming (i.e., outcomes, methods, stimuli, and contexts of priming) in this area. Fourth, some research gaps are identified in this review and the corresponding future research recommendations are proposed. The future research agenda will be discussed in the discussion part.

Table 2.14 Reviewed papers on priming in sustainable consumption

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Food	Bacon and Krpan (2018)	Sustainable priming	N/A	Past eating behaviour	Food intake	Associative priming	Perceptual priming	Menu (scan & read)
	Boland, Connell, and Vallen (2013)	Health priming	N/A	Time (morning or afternoon)	Food intake	Goal priming	Conceptual priming, perceptual priming	Video (watch)
	Bryksina (2020)	Health priming	N/A	Recipient, reactance	Consumption choice	Goal priming	Conceptual priming	Imagination
	Campbell, Manning, Leonard, and Manning (2016)	Stereotype priming	N/A	Health knowledge	Food intake	Goal priming	Perceptual priming	Image (present)
	Chambaron et al. (2015)	Health priming	N/A	N/A	Consumption choice	Affective priming	Contextual priming	Odour
	Chao (2022)	Sustainable priming	N/A	N/A	Positive feeling, willingness to pay, recycling behaviour	Semantic priming	Conceptual priming	Eco-label
	Danner and Thøgersen (2022)	Sustainable priming	N/A	Attitude, buying experience	Consumption choice, policy acceptance	Semantic priming	Repetition priming	Text (present)
	De Bauw, Franssens, and Vranken (2022)	Sustainable priming	N/A	Self-confidence	Food preference	Goal priming	Conceptual priming	Imagination
	Farmer, Breazeale, Stevens, and Waites (2017)	Sustainable priming	Prosocial focus, health consciousness	Self-control	Food purchase	Semantic priming	Conceptual priming	Verbal and graphical ads

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Food	Fatemi and Dube (2021)	CSR priming	Consideration of future consequences	N/A	Consumption choice	Semantic priming	Conceptual priming	Text (present)
	Forwood et al. (2015)	Health priming	N/A	Hunger, education level, cognitive load	Consumption choice	Goal priming	Conceptual priming	Image (evaluate)
	Friis et al. (2017)	Health priming	N/A	N/A	Food intake	Affective priming	Contextual priming	Contextual items
	Fukawa (2016)	Health priming	Response time	Cognitive load	Brand preference	Semantic priming	Conceptual priming	Text (present)
	Gao, Lowrey, Shrum, and Landau (2022)	Fullness priming	Accessibility of fullness	Word type	Food intake	Associative priming	Perceptual priming	Image (present)
	Harris, Bargh, and Brownell (2009)	Appetite priming	N/A	Restrained eating	Food intake	Semantic priming	Conceptual priming	Video (Watch)
	Hu et al. (2014)	Sustainable priming	N/A	N/A	Food preference	Goal priming	Conceptual priming	Lecture
	Huang and Labroo (2020)	Moral priming	Moral self-perception	Music genre, morality salience	Food purchase	Associative priming	Contextual priming	Auditory
	Karmarkar and Bollinger (2015)	Self-behaviour priming	N/A	Young dependents, price premium, Choice attribution	Food purchase	Associative priming	Contextual priming	Imagination
	Loebnitz and Aschemann-Witzel (2016)	Sustainable priming	N/A	Value centrality, organic labelling	Food preference	Semantic priming	Conceptual priming	Value ranking

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Food	Loebnitz, Loose, and Grunert (2015)	Sustainable priming	N/A	Time pressure	Consumption choice	Semantic priming	Conceptual priming	Imagination
	Luomala, Hellén, and Jokitalo (2018).	Situation priming	N/A	Dieting status	Purchase intent	Semantic priming	Conceptual priming	Writing
	Manippa et al. (2019)	Health priming	N/A	Food type	Attention, consumption choice	Goal priming	Perceptual priming	Image (present)
	Minas, Poor, Dennis, and Bartelt (2016)	Health priming	N/A	Gender, restrained eating	Food intake	Goal priming	Perceptual priming	Image (present)
	Mors et al. (2018)	Food odour priming	N/A	N/A	Food intake	Affective priming	Contextual priming	Odour
	Ohtomo (2017)	Health priming	Behavioural willingness	Eating habits, dieting intent	Food intake	Goal priming	Perceptual priming	Image (present)
	Panzone et al. (2021)	Moral priming	N/A	Choice architecture, carbon tax	Carbon footprint	Goal priming	Conceptual priming	Banner
	Papies et al. (2014)	Health priming	N/A	Weight status	Food purchase	Goal priming	Conceptual priming	Recipe (scan & read)
	Peloza, White, and Shang (2013)	Self-accountability priming	N/A	Guilt appeal	Consumption choice	Semantic priming	Conceptual priming	Text (thematic categorising)
	Richter, Thøgersen, and Klöckner (2018)	Health priming	N/A	N/A	Food purchase	Category priming	Conceptual priming	Image (present)
	Rohm et al. (2017)	Sustainable priming	N/A	Freshness	Willing to pay	Semantic priming	Conceptual priming	Text (present)

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Food	Sihvonen and Luomala (2017)	Health priming	N/A	Food type	Consumption choice	Goal priming	Conceptual priming	Video (evaluate)
	Stöckli, Stämpfli, Messner, and Brunner (2016)	Health priming	N/A	N/A	Food purchase	Semantic priming	Contextual priming	Poster
	Tal and Wansink (2015)	Health priming	N/A	N/A	Food purchase	Associative priming	Perceptual priming	Food sample
	Thøgersen and Alfinito (2020)	Sustainable priming	N/A	Country	Purchase intent	Goal priming	Conceptual priming, perceptual priming	Text (present)
	Van der Laan et al. (2017)	Health priming	Visual attention	Restrained eating	Consumption choice	Goal priming	Conceptual priming	Banner
	Van Doorn and Verhoef (2011)	Moral priming	N/A	Organic claim	Willing to pay	Semantic priming	Conceptual priming	Text (scrambled sentence)
	Walsh (2014)	Health priming	N/A	Depletion	Food intake	Goal priming	Conceptual priming	Text (crossing out)
	Wang and Zhang (2016)	Power priming	Motivation	Assertiveness of message	Purchase intent	Semantic priming	Conceptual priming	Text (present)
	Wansink, Shimizu, and Camps (2012)	Health priming	N/A	N/A	Food intake	Affective priming	Perceptual priming	Image (answer)
	Wilder and Webster (2011)	Regulatory focus priming	N/A	Self-regulatory orientation	Food intake	Goal priming	Conceptual priming	*Not provided in the paper*
	Wu, Li, and Zhang (2018)	Moral identity priming	Pro-environmental self-accountability	Construal level	Purchase intent	Semantic priming	Conceptual priming	Writing

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Saving & recycling	Chwialkowska and Flicinska-Turkiewicz (2021)	Frame priming	N/A	N/A	Saving & recycling behaviour	Associative priming	Conceptual priming	Presentation (interactive)
	Clot, Della Giusta, and Jewell (2022)	Sustainable priming	N/A	N/A	Saving & recycling behaviour	Semantic priming	Conceptual priming	Product evaluation
	Do, Wang, and Guchait (2021)	Social norm priming	N/A	Frame (gain/loss), anthropomorphism, interdependent self-construal	Recycling intent	Semantic priming	Conceptual priming	Text (present)
	Gómez-Román, Sabucedo, Alzate, and Medina (2021)	Sustainable priming	N/A	Message type	Acceptance for recycling apparatus	Semantic priming	Conceptual priming	Questionnaire
	Loureiro and Lima (2019)	Sustainable priming	N/A	Pro-environmental value, altruistic value	Energy saving intent	Semantic priming	Conceptual priming	Text (scrambled sentence)
	Tarabashkina, Devine, and Quester (2022)	Creativity priming	Number of new ideas, inspiration, idea originality	Individual creativity, engagement in ideation	End-use consumption	Semantic priming	Conceptual priming	Writing, imagination
	Wang, Mukhopadhyay, and Patrick (2017)	Cuteness priming	N/A	Approach motivational orientation	Recycle behaviour	Goal priming	Perceptual priming	Image (present)

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Home durables	Bimonte, Bosco, and Stabile (2020)	Sustainable priming	N/A	Frame (gain/loss)	Willing to pay	Semantic priming	Conceptual priming	Video (watch)
	Goldsmith, Roux, and Wilson (2020)	Construal level priming, competition priming	N/A	Benefit highlight, cost	Consumption choice	Semantic priming	Conceptual priming	Imagination, image (present)
	Nie, Yang, Zhang, and Janakiraman (2022)	Global identity priming	Consumption openness	N/A	Purchase intent	Semantic priming	Conceptual priming	Writing
	Verplanken and Holland (2002)	Sustainable priming	Perceived attribute importance, attention	Value centrality	Consumption choice	Semantic priming	Conceptual priming	Imagination, text (scrambled sentence)
	Wu, Li, and Zhang (2018)	Construal level priming	Pro-environmental accountability	Moral identity	Consumption choice	Semantic priming	Conceptual priming	Questionnaire
	Yan, Keh, and Chen (2021)	Social class priming, global identity priming	Dual motivation for assimilation & differentiation	Product greenness, power distance belief	Consumption choice	Category priming, semantic priming	Conceptual priming	Imagination, writing
Environmental friendliness evaluation	Rademaker, Royne, and Wahlund (2015)	Perception priming	N/A	Product type	Brand image	Semantic priming	Conceptual priming	Workshop
	Tate, Stewart, and Daly (2014)	Sustainable priming	Evaluative readiness	Environmental attitude	EF evaluation, consumption choice	Goal priming	Conceptual priming	Text (present)

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Tourism	Cain, Kim, and Tanford (2022)	Emotional priming, risk priming	Information accessibility	N/A	Purchase intent	Affective priming, associative priming	Conceptual priming	Video, questionnaire
	Kim, Tanford, and Book (2021)	Sustainable priming	N/A	Review valence, new environment	Purchase intent	Semantic priming	Conceptual priming	Questionnaire
	Mellish et al. (2019)	Sustainable priming	N/A	N/A	Attitude, purchase intent	Semantic priming	Contextual priming	Poster
	Nie et al. (2022)	Global identity priming	Consumption openness	Desire for openness, travelling orientation	Product preference	Semantic priming	Conceptual priming	Writing
	Schmücker and Günther (2018)	Sustainable priming	N/A	Pro-environmental attitude	Product preference	Semantic priming	Conceptual priming	Text (present)
	Tanford, Kim, and Kim (2020)	Sustainable priming	Brand image	Cause-related marketing	Brand image, purchase intent	Affective priming	Perceptual priming	Image (present)
	Weissmann and Hock (2022)	Sustainable priming	Brand image, environmental attitude	N/A	Brand image	Affective priming	Conceptual priming	Online post

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Multi-category	Bauer and Menrad (2020)	Sustainable priming	N/A	Ethical mindset	Carbon offset behaviour	Associative priming	Perceptual priming	Product option
	Capaldi and Zelenski (2016)	Money priming	N/A	N/A	Behavioural intent	Semantic priming	Conceptual priming	Text (present)
	Cornelissen, Pandelaere, Warlop, and Dewitte (2008)	Sustainable priming	N/A	Frequency of behaviour	Consumption choice	Semantic priming	Conceptual priming	Questionnaire
	Margetts and Kashima (2017)	Sustainable priming	N/A	Store condition, resource similarity	Pro-environmental behaviour	Goal priming	Conceptual priming	Imagination
	Nie et al. (2022)	Global identity priming	Consumption openness	N/A	Consumption choice	Semantic priming	Conceptual priming	Text (present)
	Panzone et al. (2021)	Sustainable priming	N/A	Carbon tax	Product purchase	Semantic priming	Conceptual priming	Questionnaire
Transportation	Filippini, Kumar, and Srinivasan (2021)	Sustainable consumption	N/A	N/A	Consumption choice	Semantic priming	Conceptual priming	Image (present)
	Hahnel, Ortmann, Korcaj, and Spada (2014)	Sustainable priming	N/A	Product attribute, value centrality	Product evaluation	Associative priming	Perceptual priming	Image (search). Image (evaluate)
	Légal, Meyer, Csillik and Nicolas (2016)	Travel mode priming	N/A	Habit strength, mindfulness	Response speed	Goal priming	Conceptual priming	Text (scrambled sentence)

Continued

Empirical context	Citation	Variables				Priming		
		IV (priming)	Mediator	Moderator	DV	Outcome	Method	Stimulus
Fashion	De Groot (2021)	Hygiene priming	Mood; store, staff, and product evaluation	N/A	Product purchase	Affective priming	Contextual priming	Odour
	Hyun, Lee, and Kim-Vick (2021)	Regulatory-focus priming	N/A	Fashion leadership, trade-off type	Product preference	Semantic priming	Conceptual priming	Verbal & graphical ads
	Lee et al. (2020)	Sustainable priming	N/A	Green logo	Product preference	Semantic priming	Conceptual priming	Video (present)
	Roozen, Raedts, and Meijburg (2021)	Sustainable priming	N/A	N/A	Consumption choice	Semantic priming	Conceptual priming	Auditory, image (present)
	Talukdar and Yu (2020)	Materialism priming	Perceived functional value	Product conspicuousness	Purchase intent	Semantic priming	Perceptual priming	Image (present)
	Yan et al. (2021)	Social class priming	Dual motivation for assimilation & differentiation	Power distance belief	Purchase intent	Category priming	Conceptual priming	Imagination

2.6. Discussion

In this paper, a comprehensive map is provided to delineate the research boundary of applying priming in promoting sustainable consumption and to explore potential research agendas in this area. Sustainable consumption has been an attractive area and many researchers have endeavoured to find effective ways of encouraging consumers to adopt sustainable daily purchases (Funk et al., 2020; Röös et al., 2014). The majority of conventional studies and behavioural change policies have spotlighted attitudes change to spur sustainability, but some studies assert that relying on attitude change as a route to behaviour modification is not as effective as we thought. Thus, another kind of behavioural change technique that does not focus on changing attitudes has attracted more attention: priming. Priming has been applied to promote sustainable consumption. However, there is no view of where the area is going and what is the current research boundary of it. Thus, a comprehensive scoping review is conducted to provide an overview of this research area and help intrigued researchers synthesise research evidence, map existing literature, and examine the extent, range, and nature of research. By completing this review, an overview map encompassing general, theoretical, and methodological characteristics are rendered.

The results corroborate that applying priming in promoting sustainable consumption has gained momentum as a distinct research area in the last two decades. This is a clear trend and more papers (about 82%) have been published in this area since 2015. The geographical spread of the research is centralised. Around 75% of the research is conducted in Europe and the US. The momentum of the food market is getting back to a more normal level of preponderance, and researchers are becoming more interested in other markets, such as transportation and tourism markets.

This review yields key insights on the theoretical side. Around 73% of studies only have a practical purpose. These studies are not undertaken to drive theoretical exploration,

and this is reflected by the research status of mediators. Among 115 studies, only 24 mediators are identified, which shows a scarcity of mechanism investigation. At the same time, 13 theory themes have been discussed and the *external cognition* theory theme is used the most. This finding demonstrates that academic research in priming sustainable consumption has concentrated on the core position of consumers' perceptions toward external entities or units. Under the *external cognition* theme, the concept of loss aversion, psychological distance, and attitudes are studied to find possible reasons to explain the unstable effect of priming. Moreover, the conventional idea of attitudes-changing tactics is not exclusive to pervasive behavioural change techniques such as priming. Under some circumstances, consumers' beliefs and attitudes can potentially be changed in a short time by priming or other behavioural change techniques (e.g., norm). For instance, from the lens of psychological distance theory, under the condition of close psychological distance by a priming manipulation, consumers with higher pro-environmental consciousness may change their attitudes towards sustainable products relatively quickly.

Theories in other categories are also influential in the area. Theories in the *value & goal* theme are used the second most times, which is echoed by the large proportion of goal priming (25.2%) in all five priming outcomes (see Table 2.12). For consumers with adequate and commendable pro-environmental goals and values but deviating from these goals and values in behaviour, this theoretical perspective could be practically impactful. In addition, these goal and value theories could help explore boundary conditions of priming. For instance, based on value theories, priming is proposed to be more effective when it is aligned with specific values (see Table 2.9).

In addition, there are 23 moderator clusters identified. Prior research mainly focuses on factors that are relatively more susceptible and cross-contextual (top right quadrant in Figure 2.5). It keeps a tolerable balance between factors that are more susceptible and less

susceptible to manipulations but pays disproportional attention to cross-contextual factors. However, this is not consistent with the research context. The majority of selected studies are conducted in a single market, principally the food marketplace. Hence whether these cross-contextual factors are as cross-contextual as the three raters assess, may need more research to probe and analyse. Furthermore, behavioural change techniques can have different boundary conditions in different contexts (i.e., context-specific) (Weingarten et al., 2016; Wheeler & Berger, 2007). For example, a recent study puts forward that financial knowledge and numerical ability can alter to what extent individuals are affected by nudging in the context of the 'annuity and pension' (Mrkva et al., 2021). For researchers who are interested in specific contexts (e.g., transportation), exploring more context-specific moderators may inspire more sustainable consumption in practice. Another important finding is the imbalance of research focus across susceptibility and contextuality dimensions for consumer-independence moderators. All eight consumer-independence moderator clusters are located in the top right quadrant of Figure 2.5, which implies that prior research is deficient in exploring consumer-independence moderators with low susceptibility (e.g., social norm, industrial structure, and culture) or with low contextuality (e.g., perceived credibility of aviation carbon offset projects).

In terms of methodological characteristics, many selected studies are either lab or online experiments that provide good conditions for control. Nevertheless, researchers who want to stimulate sustainable consumption in practice may be inclined to cooperate with industries to conduct more field studies. As for the priming stimuli, the top five types are image, imagination, text, video, and writing tasks, and many of these stimuli have medium engagement levels and low sensory richness levels. Since online shopping is prevailing on both websites and shoppable app platforms (WARC, 2021), more types of practical priming stimuli might be developed with different levels of engagement and sensory richness, such as

embedding the priming into an in-app game system (e.g., ant forest) or interactive web persona or avatar.

2.6.1. Conceptual framework and contributions

The scoping review renders a conceptual framework containing key foci of general, theoretical, and methodological characteristics (see Figure 2.6). First, the framework starts with the taxonomies and profile of priming, which indicates how previously studied priming locates into different taxonomies and some basic "demographics" of priming. This part could guide future researchers who want to dive further into some priming methods or discover underdeveloped ones. Second, in the middle, prior-studied mediators and moderators are integrated and mapped, which provides new dimensions of systematising existing mechanisms and conditionalities and sparks new insights into exploring new potential factors. Third, on the right side, sustainable outcome delineates an overview of the interests of previous studies in terms of consumption contexts or markets. Researchers could explore what other consumption outcomes would be the next research topic. Researchers could treat this overview as a starting point. Furthermore, in the box of 'research feature' with the dotted line, researchers can easily know the main research methods and sample types, and in the box of 'context' also with the dotted line, it is clear to see the geographical concentration in the developed world, and a rising trend of this research area by time.

This scoping review contributes to the literature through the following ways. Firstly, it provides a comprehensive definition of priming by analysing previous definitions through the lens of three focuses (see Table 2.1). Secondly, this review identifies key characteristics and factors related to priming in sustainable consumption. Regarding priming, this review identifies four key components (outcome, method, stimulus, and context) and provides an overview of how these components have been investigated in previous research. For

instance, the review highlights that the five primary types of stimuli used in these studies encompass images, imagination, text, videos, and writing tasks. By delineating the status of research on these four constituents, the review sheds light on the current understanding of priming effects. Many of these stimuli exhibit moderate levels of engagement and are characterised by low levels of sensory richness. Moreover, the characteristics of prior-studied mediators and moderators are analysed, which indicate that only two mediators are categorised as cognitive processing and previous research has maintained a satisfactory equilibrium between susceptible and unsusceptible factors, although it has placed greater emphasis on high-contextual factors.

Thirdly, this review explicates how research is conducted on the topic. The review highlights that previous studies primarily focus on developed countries, specifically within the context of food consumption, and employ online or lab experiments. Furthermore, these studies display an imbalance in terms of their primary purpose, as they predominantly prioritise practical applications only while losing sight of theoretical explorations. The theoretical framework underlying these studies is primarily based on 'external cognition' theories. The most commonly used priming outcome is semantic priming, while the conceptual priming method is frequently employed. Fourthly, the review introduces a novel analytical framework for comprehending moderation factors, which organises these factors within a three-dimensional coordinate system. This framework provides a valuable tool for examining the influence of different factors. Additionally, the review presents a fresh framework for understanding priming stimuli, which assesses the sensory richness and engagement level of these stimuli. This framework allows for a comprehensive evaluation of the sensory and cognitive aspects of priming stimuli, enhancing our understanding of their effects.

Fifthly, the review highlights several research gaps within the field. One prominent gap

is the absence of studies conducted in developing countries, indicating a geographical bias in previous research. Additionally, there is a noted lack of theoretical strength, particularly concerning research purpose and the examination of mediation and moderation effects. Also, the role of consumer types may be considerable. In certain consumption contexts, the characteristics of consumers themselves may act as critical conditional factors in the priming effect. For instance, in the case of technical products like virtual reality (VR) equipment or intelligent vehicles, early adopters and laggards might exhibit divergent responses to priming manipulations. It is important for future research to explore how individual differences and consumer characteristics influence the effectiveness of priming interventions, particularly in specialised contexts where consumer traits may play a significant role in shaping the outcomes of priming effects. Even for the practical application of priming, in terms of the practical application of priming, previous research has not extensively explored the relationship between the effectiveness of priming and the potential combination of different priming stimuli, outcomes, and methods. There is a need for further investigation into how the effectiveness of priming interventions may vary or be enhanced when different combinations of stimuli, outcomes, and methods are employed. This line of inquiry would provide valuable insights for designing more effective and tailored priming interventions in real-world settings. These gaps point to areas where further investigation and theoretical development are needed to advance the understanding of the topic.

Lastly, based on the aforementioned research gaps, a future research agenda is proposed, which will be discussed in more depth in the subsequent section (2.6.2). This research agenda aims to address the identified gaps and further advance the understanding of priming effects in sustainable consumption. By delving deeper into these research directions, future studies can contribute to the development of theoretical frameworks, exploration of boundary conditions, examination of cognitive processes, investigation of consumer

characteristics, and exploration of practical applications. In summary, this review makes a valuable contribution to the existing literature by thoroughly examining the volume, extent, and scope of research in the field of priming effects in various consumption contexts. It provides a comprehensive overview of the general, theoretical, and methodological characteristics of this area of study. Moreover, the review serves as a catalyst for shaping future research endeavours by identifying research gaps and proposing a research agenda. Overall, this review enhances our understanding of priming effects in sustainable consumption and provides valuable insights for future studies in the field.

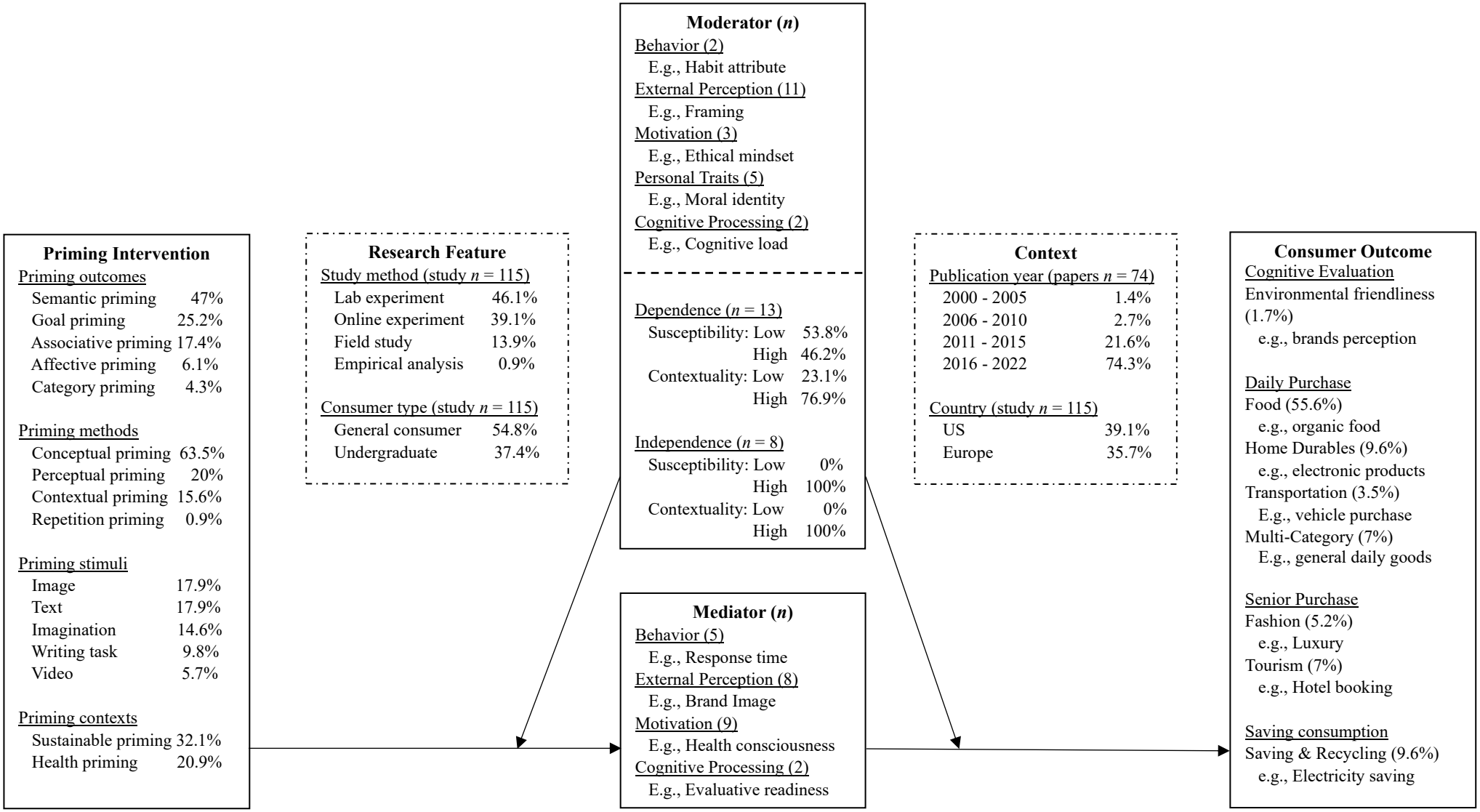


Figure 2.6 The conceptual framework of the scoping review

2.6.2. Future research agenda

Table 2.15 Suggested questions for future research

Theme	Potential Research Question
Different Priming	• Does sensory richness or engagement of priming stimuli affect the effectiveness of priming interventions? • What are the most effective combinations between priming stimuli and priming outcomes and priming methods? • Can AR, VR, and metaverse technology be facilitative in creating new priming stimuli with high sensory richness and engagement levels?
Cognitive Processes	• What are the possible mechanisms to explain how priming interventions cause consistent or reactant responses? • Do different priming outcomes and methods have different cognitive processes? • Do different contexts of priming (e.g., health priming, self-accountability priming) have different cognitive processes?
Boundary Conditions	• What are the possible boundary conditions for priming regarding different cognitive processes resulting in consistent or reactant responses? • How robust are the high-contextuality moderation factors across different consumption contexts? • What are the potential new low-contextuality moderation factors in various consumption contexts and how can marketers apply them? • What could be potential new consumer-independence moderation factors with low contextuality or low susceptibility?
Consumer Type	• Will different types of consumers (e.g., early adopters and laggards) react differently to sustainable consumption priming when purchasing technical products? • Will different types of consumers (e.g., frequent and non-frequent buyers) react differently to sustainable consumption priming when purchasing luxury products? • What are the other potential consumption contexts where consumer types may play a pivotal role regarding sustainable consumption priming?
Geographic Effect	• What are the key cultural factors that may influence the appropriateness of different priming outcomes, methods, stimuli, and contexts of priming? • Will other geographic factors rather than culture (e.g., industrial structure, business practice) affect the appropriateness of different priming outcomes, methods, stimuli, and contexts of priming?

Based on the conceptual framework (Figure 2.6), future research in priming sustainable consumption can build in five directions (see Table 2.15): (1) different priming, (2) mechanism, (3) boundary conditions, (4) consumer type, and (5) geographic effect. First, different priming stimuli have different levels of sensory richness and engagement. Prior research has not investigated a possible relationship between sensory richness or engagement and the effectiveness of priming. However, understanding this relationship is expected to help marketers choose different types of stimuli based on their needs. For instance, under some conditions priming stimuli with high-level engagement may cause more positive

results while under some other conditions, they may lead to more reactant responses. In addition, future research can also endeavour to identify the optimal combinations between priming stimuli and priming outcomes or methods. For instance, a priming stimulus with low engagement and sensory richness may be more suitable for the repetition priming than the conceptual priming (this thought needs to be tested). This review also indicates that prior research rarely applies priming stimuli with both high sensory richness and engagement. Whereas technologies advance quickly, the context of purchase keeps shifting, and new forms of shopping are emerging, such as group purchases, live-streaming selling, and one-to-one live shopping. In addition, enhanced with AR, VR, and metaverse technologies, new forms of shopping would come into researchers' view as well (Dwivedi et al., 2022; Rauschnabel, Felix, & Hinsch, 2019; Yung, Khoo-Lattimore, & Potter, 2021). Therefore, exploring new priming stimuli with both high sensory richness and engagement underpinned by these new technologies may be a must-have for companies in such a technology-driven world.

Second, more research is needed on the cognitive processes of priming. As mentioned previously, 73% of previous studies only have a practical purpose and only 25 studies investigate the mediation effect. Different priming outcomes and priming methods may have nuance regarding the mechanism, and considering the mechanism to explain how different moderation factors can take an effect, current research about the mediation effect is deficient (Albarracin, & Dai, 2021). Additionally, in Table 2.10, it is clear that some mediators studied are not explaining the cognitive processes, such as *response time* and *brand image*, and there is only one factor that is classified into ‘cognitive processing’. However, exploring the cognitive processing of priming can help explain how and why the pendulum of priming affects consumers in contradicting directions (i.e., consistent/reactant response). For example, some studies claim that money priming has two seemingly contradicting findings.

On the one hand, money highlights the importance of cost-saving, leading to the choice of low costs. On the other hand, money can be regarded as a symbol of social status and produce the choice of high cost (Kim, 2017). Hence, more future research is needed to explain the processes of priming in sustainability.

Third, future research in this field should aim to better identify the boundary conditions for priming sustainable consumption. It has been well-documented that the priming effect exhibits pervasive boundary conditions (Chartrand et al., 2008; Sela & Shiv, 2009). This research direction could be integrated with the examination of cognitive processes. Different cognitive processes may lead to consistent or reactant responses, indicating the existence of varying boundary conditions. Therefore, it is crucial for future research to investigate when and how priming elicits consistent or reactant responses by identifying specific cognitive processes and their corresponding boundary conditions. This line of inquiry will contribute to a deeper understanding of the underlying mechanisms and contingencies associated with priming effects in the context of sustainable consumption.

Furthermore, according to Figures 2.5 and 2.6, previous studies mainly investigate high-contextuality moderators, which are supposed to be effective in different consumption contexts. However, many of these cross-contextual moderators are studied in a single context. Hence, future research needs to analyse and test whether these cross-contextual moderators are as across-contextually robust as the three raters assess. The results also show that the investigation of context-specific moderation factors is deficient. There are only three moderator clusters in the position where contextuality is relatively low, and they are all specific to the food consumption context. Context-specific moderation can also help marketers to encourage sustainable consumption and constrain the occurrence of reactant responses. Thus, future studies could look into what are the possible context-specific factors that may help marketers indeed, especially in non-food consumption contexts. Finally, this

review suggests that future research on consumer-independence factors is needed, especially for the factors with low contextuality or low susceptibility (see Figure 2.6). Some typical consumer-independence factors with low susceptibility may include social norms and culture, and typical factors with low contextuality may include the perceived credibility of carbon offset projects in the flight ticket context (Liu, Jiang, & Gleasure, 2021) and technological complexity in the electric vehicle context (Xie, An, & Yasir, 2022).

Fourth, more than half of studies recruit general consumers as participants, which is appropriate for daily purchase contexts (see Figure 2.6). However, for some other consumption contexts, the type of consumers may play an important role as a special conditionality in the priming effect. For example, for technical products, such as VR equipment and intelligent vehicle, early adopters and laggards might respond to priming manipulations differently (Palm, 2020). And for premium products such as luxury textiles, frequent buyers and non-frequent buyers might be differently susceptible to priming interventions (Zhang, Cude, & Zhao, 2020). Or, these various consumers possibly react differently to some other factors that may moderate the effect of priming. Future research, therefore, could explore the potential effects of consumer type to aid marketers to promote sustainable consumption more precisely and efficiently.

Fifth, considering that most of the prior research is conducted in the US and Europe, future research could investigate the priming effect in other geographic areas. It is necessary to encourage sustainable consumption in other regions. Although the emission levels per capita in developing areas are much lower than in the US or Europe, the total amount is considerable. For example, in 2018, India has 2.67 tons of GHG emission per capita while the US has 19.27 tons, but the total emission of India is around 57% of the US (Mamatha & Kulkarni, 2022). It is also practical to promote sustainability in developing countries. For instance, a recent study reports a successful and economic tactic to promote the adoption of

an eco-friendly pesticide to the peasantry in rural China through online social media (Zhang et al., 2021). While sustainable priming overall seems to be quite effective in most of the world (Sunstein & Reisch, 2019), it would be meaningful to explore any possible cultural effects (Aarts, Oikawa, & Oikawa, 2010; Merunka, 2013). Different areas encompass not only different cultural backgrounds, but also different industrial structures and business practices. Regarding industrial structures, in states where the industrial structure is single or dominated by a small number of industries, different priming interventions might work differently compared with a state where the industrial structure is more complex. As for business practices, states may be different with respect to popular product types, price levels, and consumers' purchase routines and habits. Therefore, different priming outcomes, methods, stimuli, and contexts of priming may be differently suitable for these states.

2.6.3. Concluding thoughts

There are several limitations to this review. First, to keep a balance between feasibility and comprehensiveness, the search scope was limited to the last two decades. Consequently, it is possible that relevant literature from earlier years, particularly those published in the last century, may not have been captured in this review. Secondly, due to the authors' language proficiency and the diversity of languages, only manuscripts written in English were included. As a result, there is a possibility that relevant literature written in non-English languages was excluded, which could introduce bias in the findings. However, it is important to note that the findings presented in this review offer a snapshot of the current state of the scientific literature on priming in sustainable consumption.

This scoping review is guided by a predetermined protocol and used rigorous and transparent methods throughout the entire process based on widely recognised frameworks

(Arksey & O'Malley, 2005; Levac et al., 2010; Peters et al., 2015). There are two reviewers engaged in paper screening and selection, as well as data extraction. Grounded on these strengths, this review brings about four main contributions. First, this scoping review delineates the research boundary of the area. In this review, researchers could easily find what kind of outcomes, methods, stimuli, and contexts have been studied, what theories have been applied, and what factors have been studied as mediators and moderators. Second, this review brings to bear new approaches to analyse prior research in this area, such as the 'contextuality', 'susceptibility', and 'dependence/independence' dimensions when analysing moderation factors, and 'sensory richness' and 'engagement' when thinking about priming stimuli. Third, it integrates different conceptualisation streams of priming together and provides a more comprehensive definition and summarises the four constituents of priming (i.e., outcomes, methods, stimuli, and contexts). Fourth, some research gaps are identified in this review and the corresponding future research recommendations are proposed.

To conclude, this scoping review characterised and described the current status of applying priming in promoting sustainable consumption. Priming has increased in popularity in recent years in the sustainable consumption area. However, there is no standard and systematic overview of the status of the area and what are the research boundaries of it. Therefore, there is a need for delineating a systematic map to identify what kind of priming outcomes, methods, stimuli, and contexts have been studied, what theories have been applied for describing, explaining, and predicting, and what factors have been studied in this area as moderators, and mediators. By completing this scoping review, an overview map encompassing general, theoretical, and methodological characteristics are rendered, and potential research agenda is proposed as well.

3. Chapter Three: Essay Two - Do We Need to Care about the Carbon Emissions from Flights? How Do Consumers Shift the Moral Burden away from Non-Sustainable Consumption

Abstract

Amid growing concerns about the environmental impact of air travel, many airlines have created schemes that enable consumers to purchase voluntary carbon offsets when travelling. However, despite the airlines' investments in creating and programming these schemes, consumer uptake remains limited. This research aims to identify one possible mechanism for delineating the process of how consumers give up buying carbon offsets even when they are informed of the environmental cost of taking a flight. Three online experiments were conducted to explicate how consumers justify non-sustainable consumption and shift their moral burden away from such consumption. Findings indicate that consumers have stronger motivations to justify their behaviour of taking a flight when they feel psychological-closely connected with a vacation by air (study 1), and such motivation can negatively affect the purchase decisions of voluntary carbon offsets (study 2) and even general pro-environmental behaviour in daily life (study 3). Contribution to theoretical knowledge and implications for practice are provided, and recommendations for future studies are discussed.

Keywords Motivated reasoning, social psychological distance, voluntary carbon offsets, psychological distance priming

3.1. Introduction

To tackle environmental challenges such as climate change, and to gain long-term benefits from a sustainable strategy, many industries are employing new business models that encourage sustainable consumption (White, Habib, & Hardisty, 2019). As air travel emissions contribute at least 8% to the global carbon footprint (Strauss & Cui, 2021), and are predicted to increase by 300% by 2050 (Higham, Ellis, & Maclaurin, 2019), airlines have taken a series of measures to tackle this issue, such as switching to aviation biofuels and providing voluntary carbon offsets for consumers (Guix, Ollé, & Font, 2022). Voluntary carbon offsets pass on the responsibility of containing carbon emissions of air travel to consumers by encouraging them to pay an extra fee to contribute to pro-environmental projects that reduce carbon emissions (e.g., protecting tropical rainforests) (Ritchie, Kemperman, & Dolnicar, 2021). Yet, the purchase rate of aviation voluntary carbon offsets is low, with less than 10% of air passengers purchasing them (Zhang, Ritchie, Mair, & Driml, 2019).

Researchers have investigated why consumers are not engaging in voluntary carbon offsets. Prior research mainly argues that consumers are not buying carbon offsets because they are not aware of this product (Denton, Chi, & Gursoy, 2020; Gössling et al., 2009; Lu & Shon, 2012). However, the purchase rate of aviation voluntary carbon offsets is significantly lower than the awareness rate of it (c.f., Kim, Yun, Lee, & Ko, 2018; Lu, & Wang, 2018; Zhang, Ritchie, Mair, & Driml, 2019). Current findings cannot explain why some consumers do not engage in voluntary carbon offsets even after being aware of it and when consumers become more reactant to engage. Some other studies argue that consumers do not purchase voluntary carbon offsets because they do not trust carbon offset projects (Babakhani et al., 2017; Blasch & Farsi, 2014; Liu, Jiang, & Gleasure, 2021). However, research shows that only a small percentage of the variance in purchase intention for voluntary carbon offsets can

be explained by credibility (Zhang et al., 2019). Therefore, previous research fails to explain why the purchase rate of trustworthy carbon offset projects cannot be significantly increased (Zhang et al., 2019).

This paper provides insights into why the purchase rate of aviation voluntary carbon offsets is low (which is important but missing in prior research). Drawing upon the moral self-regulation framework (Sachdeva, Iliev, & Medin, 2009) and construal-level theory (Trope & Liberman, 2010), this research investigates the role of motivated reasoning and social psychological distance in decreasing sustainable consumption. By conducting three online experiments, it concludes that when knowing the negative environmental impact of taking a flight, consumers who feel more social-psychologically close to the vacation by air, will have higher levels of motivated reasoning, which decreases their interest in purchasing voluntary carbon offsets and become more reluctant to behave pro-environmentally in general. This decision process for explaining the low purchase rate of aviation voluntary carbon offsets provides a new theoretical perspective on how to promote purchasing voluntary carbon offsets.

3.1.1. Contributions of the current research

By providing an alternative explanation to explain why consumers are not engaging in voluntary carbon offsets, this research offers two substantive contributions. First, it contributes to the literature on voluntary carbon offsets. Prior research fails to explain why the purchase rate of voluntary carbon offsets is significantly lower than the awareness rate of it. This paper explores the key role of motivated reasoning in explaining why some consumers do not engage in voluntary carbon offsets even after being aware of it. Motivated reasoning refers to the tendency leading to justifications or decisions based on self-serving

goals or motives rather than an accurate reflection of the evidence, through which people can arrive at conclusions they prefer (Kunda, 1990). Thus, for consumers who are aware of carbon offset projects, researchers can encourage them to purchase voluntary carbon offset by decreasing their chances of motivated reasoning. For instance, research shows that motivated reasoning for justifying sweatshop labour can be weaker if consumers compare different brands jointly (i.e., joint evaluation for different market actors) (Paharia, Vohs, & Deshpandé, 2013). Thus, airlines may employ social norms to guide consumers jointly compare themselves with the public standards or behaviour to weaken their motivated reasoning.

Second, this research contributes to the literature on morality in marketing. Various studies on moral behaviour draw on the moral self-regulation framework (Sachdeva et al., 2009), which employs the concept of moral self-worth to describe individuals' moral actions. When individuals feel that their moral self-worth is below an ideal standard, they tend to have moral cleansing to restore their moral self-worth. Apart from moral cleansing, an easier way to restore moral self-worth and weaken the threat to moral self-concept can be cognitive self-serving justifications (i.e., motivated reasoning) instead of conducting moral cleansing behaviour (Shalvi, Gino, Barkan, & Ayal, 2015). However, this idea has not been tested and applied widely in sustainable consumption. This research quantitatively tests this idea in sustainable consumption and successfully explains why and when consumers become more reactant to enact sustainable consumption.

3.1.2. Overview of the current research

In what follows, we draw on the moral self-regulation framework (Sachdeva, Iliev, & Medin, 2009) and construal-level theory (Trope & Liberman, 2010) to examine the relationship between motivated reasoning and psychological distance. Our initial

argumentation is followed by a discussion of the role of *the presence/absence of introducing the negative impact of flying on the environment* (environmental information of flying) in activating motivated reasoning, which in turn negatively affects the purchase decisions toward voluntary carbon offsets and general pro-environmental behaviour. Moreover, we examine how primed social psychological distance can moderate the relationships between environmental information of flying and motivated reasoning.

We report the results of three experimental studies designed for testing the role of motivated reasoning in purchasing voluntary carbon offsets. Across three studies, we demonstrate that when knowing the negative impact of flying on the environment, consumers who feel closely (vs. distantly) psychologically connected with a vacation by air become more motivated to justify their behaviour of flying and then express less interest in purchasing voluntary carbon offsets. These consumers even become more reactant to conduct daily pro-environmental behaviour. We conclude by discussing our contributions to the literature on voluntary carbon offsets and morality in marketing and outline important implications for airlines communicating CSR information.

3.2. Theoretical Background and Hypotheses

Given the need to dwindle the carbon emissions from air flights, a suite of measures has been employed, such as switching to aviation biofuels and increasing the fuel efficiency of aircraft (Becken & Mackey, 2017). Apart from these measures that seem to be far away from individual consumers, voluntary carbon offsets were introduced as an important tool that consumers can easily engage in voluntarily. Yet less than 10% of air passengers buy voluntary carbon offsets (Zhang et al., 2019). Prior studies try to explain this phenomenon through deficient awareness rates and weak credibility of voluntary carbon offsets. However,

these studies fail to explain why consumers are not purchasing carbon offsets after being aware of it and why consumers are not as positively responsive to carbon offset projects as expected. Thus, this paper draws on the moral self-regulation framework (Sachdeva et al., 2009) and construal-level theory (Trope & Liberman, 2010) to explain why and when consumers are not purchasing voluntary carbon offsets.

3.2.1. Justifying behaviour with motivated reasoning

Research shows that a significant proportion of travellers hold positive attitudes toward offset programs and express a willingness to contribute to tourism carbon offsets programs (Scott, Gössling, Hall, & Peeters, 2016; Denton, Chi, & Gursoy, 2020). To bridge the gap between consumers' attitudes toward carbon offsets and their actual behaviours, it is essential to explain how consumers face and tackle cognitive dissonance after knowing the environmental cost of taking a flight (Festinger, 1962).

When people realise that what they have done or plan to do could be considered a 'vice', their moral self-concept is threatened, which is expected to cause cognitive dissonance (Cameron & Payne, 2012). One possible approach to resolve such dissonance is to change behaviour, and according to the moral self-regulation framework (Sachdeva et al., 2009), people use moral self-worth to gauge whether moral action is needed (Sachdeva et al., 2009). Moral self-worth is defined as the extent to which people perceive they are moral (Dunning, 2007). When moral self-worth is above an ideal level or standard, people feel "too moral", and then one kind of compensatory behaviour, namely, moral licensing, may occur. For instance, participants are more likely to splurge on a frivolous purchase (e.g., to choose a pair of luxury jeans over a sturdy but boring vacuum cleaner) after imagining that they have been involved in volunteer community service (Khan & Dhar, 2006). Immoral behaviour has

a negative influence on moral self-worth, which threatens moral self-concept. To restore some of the decreased moral self-worth, people tend to engage in another kind of compensatory behaviour (i.e., moral cleansing), to return their moral self-worth to a more comfortable level. For example, participants who reported more moral distress when they play a game with violence against humans, selected more hygiene products subsequently (Gollwitzer & Melzer, 2012). Thus, according to the moral self-regulation framework, when consumers realise they are causing environmental harm in their consumption activities, they are supposed to engage in moral cleansing behaviour. In the context of taking a flight, after knowing the environmental cost of taking a flight, consumers are expected to feel decreased moral self-worth and then are more likely to have moral cleansing, specifically, being more likely to pay for voluntary carbon offsets.

Apart from moral cleansing, consumers can regain their lost moral self-worth and resolve the cognitive dissonance through motivated reasoning, without changing their behaviour. Motivated reasoning refers to the tendency of self-serving justification and reasoning in the service of directed goals or motives, through which people can arrive at conclusions they prefer and protect their self-concept (Kunda, 1990). To arrive at specific conclusions, people rely on cognitive processes to search for and generate beliefs and arguments that support the preferred interpretations and justify their ‘vice’ behaviour (Kunda, 1990). In the context of consumption, moral judgments about consumption behaviour are vulnerable to self-interested motivational factors (Paharia et al., 2013). For instance, consumers are more likely to rationalise the use of sweatshop labour when the products made by sweatshop labour are highly desirable (Paharia et al., 2013). By rationalising and justifying their past ‘vice’ purchases, consumers can keep regarding themselves as moral people even as they engage in ‘vice’ purchases by shifting the moral burden away (Shalvi et al., 2015). Translated to the context of voluntary carbon offsets

purchase decisions, motivated reasoning can help explain why consumers are not willing to pay for it. To be specific, given that many consumers do not pay for voluntary carbon offsets, it is reasonable to speculate that consumers are motivated to justify and rationalise the behaviour of taking a flight, especially when reasonable justifications are accessible and reachable, which bridges consumers' two opposing desires: take advantage of flights and to see themselves as environmentally friendly.

3.2.2. The role of social psychological distance

Consumers are expected to have different motivation levels to protect their threatened moral self-concepts when the social psychological distance between immoral behaviour and moral self-concepts varies (McDonald, Chai, & Newell, 2015). Psychological distance refers to the "subjective experience that something is close or far away from the self, here, and now" (Trope and Liberman 2010, p. 440). While psychological distance consists of temporal distance, spatial distance, and hypothetical distance (probabilistic proximity) (McDonald et al., 2015), several aspects of social cognition have also been revealed to influence perceived psychological distance (i.e., social psychological distance). Social psychological distance refers to the distance between the self and a social target, that is, how similar another individual or group or social role is to the self (Spence, Poortinga, & Pidgeon, 2012; Trope, Liberman, & Wakslak, 2007). For instance, an event perceived to be related to "we" (i.e., first-person lens) is psychologically closer than an event perceived to be related to "they" (i.e., third-person lens) (Pronin & Ross, 2006).

Psychological distance influences construal level, leading to changes in consumer behaviour. According to construal level theory (Trope & Liberman, 2010), the greater the psychological distance of an object or an event from a person, the greater the probability that

the person conceptualises and represents the object or the event at a higher level of abstraction (i.e., high-level construals). By contrast, people tend to conceptualise and represent psychologically close objects or events at a higher level of concreteness (i.e., low-level construals). This relationship between psychological distance and construal level applies to all three critical dimensions of psychological distance: spatial, temporal, and social (Snefjella & Kuperman, 2015). Whether the level of construals of the information is congruent with the psychological distance between objects and consumers affects consumer behaviour. Research shows that consumers evaluate brands more favourably (Connors, Khamitov, Thomson, & Perkins, 2021), and own more positive attitudes toward travelling destinations (Wang, & Lehto, 2020) and hotels (Kim, Kim, Kim, & Magnini, 2016), and are more likely to purchase voluntary carbon offsets (Liu et al., 2021) when the concreteness of communication messages are congruent with the psychological distance between consumers and brands, service providers, or the products. As for the social psychological distance specifically, research suggests that when imagining a vacation by themselves, consumers are more inclined to justify and rationalise the employment of sweatshop labour by holiday resorts, compared with a vacation by their friends (Paharia et al., 2013). Translated to the context of voluntary carbon offsets, the social psychological distance between consumers and vacations by air, hence, is expected to influence the motivation of self-serving justifications and rationalisation of taking a flight without offsetting the carbon emissions.

Individuals strive to maintain a positive moral self-concept both privately and publicly (Rosenberg, 1979), as a result, people tend to think differently about their immoral behaviour than those of others insofar as they think they are more virtuous than other people (Messick & Bazerman, 1996). For instance, sometimes moral hypocrisy may occur, during which people evaluate their moral transgressions to be more inevitable than others' moral transgressions (Batson, Thompson, & Chen, 2002). This is named as the double-distancing

mechanism (Barkan, Ayal, Gino, & Ariely, 2012), that is, when people face dissonance between their moral self-concept and immoral behaviour, they try to distance themselves from the transgressions. People apply stricter moral standards to judge others' immoral behaviour more harshly. By doing so, the distance between their moral self-concept and 'vice' consequences becomes distant. That is, people demonise others to view themselves as virtuous, and lessen the tension of the dissonance between themselves and 'vice' consequences (Barkan et al., 2012). Thus, we propose that the closer the social psychological distance between consumers and the experience associated with immoral behaviour, the higher the threats towards one's moral self-concept, and the higher the motivation to defend one's moral self-concept. Regarding taking a flight, under close social psychological distance, knowing the environmental cost of taking a flight can threaten the moral self-concept:

> **Hypothesis 1**. Motivated reasoning to protect one's moral self-concept will be higher when exposed (vs. absent) to information about the negative environmental impact of taking a flight under close social psychological distance (vs. distant social psychological distance).

Table 3.1 Selected papers on motivated reasoning and behaviour

Citation	**Empirical contexts**			**Agent engagement**		**Role of motivated reasoning**		
	Topic	Agent	Method	Evaluate	Decision	Trigger	Process	Outcome
Arango et al. (2022)	Organisation greed	Consumers	Empirical (experiment)	X		X		
Agrawal and Maheswaran (2005)	Brand preference	Consumers	Empirical (experiment)	X		X		
Boyer (2021)	News consumption	Voters	Empirical (experiment)	X				X
Druckman and Bolsen (2011)	Emergent technology acceptance	Consumers	Empirical (experiment)	X		X		
Gino et al. (2016)	Sustainable consumption	Consumers	Empirical (interview)	X				
Jain and Maheswaran (2000)	Brand preference	Consumers	Empirical (experiment)	X				X
Jost (2017)	Ideology	Voters	Conceptual (debate)					X
Paharia et al. (2013)	Sweatshop labour	Consumers	Empirical (experiment)	X				X
Sorace and Hobolt (2021)	Economic perception	Voters	Empirical (experiment)	X				
Tully and Sharma (2022)	Wealth perception	Consumers	Conceptual (review)	X		X		
Welsh et al. (2020)	Organisational goal setting	Employees	Empirical (experiment)		X		X	
This article	Voluntary carbon offset	Consumers	Empirical (experiment)		X		X	X

3.2.3. The effect of motivated reasoning on behaviour

When facing moral cognitive dissonance, people can resolve it by motivated reasoning, through which people justify and rationalise their immoral behaviour. Through this cognitive mechanism, threats to moral self-concept can be attenuated (Barkan et al., 2012; Shalvi et al., 2015). How motivated reasoning influences individuals' behaviour is mainly studied in the area of political voting and consumer psychology. As shown in Table 3.1, prior research principally focuses on how motivated reasoning influences individuals' evaluation toward a policy (Boyer, 2021) or a company (Arango, Singaraju, Niininen, & D'Souza, 2022), while losing sight of the effect of motivated reasoning on a behavioural decision (e.g., purchase decision and vote decision). Moreover, in previous research, motivated reasoning has rarely been studied as a process between a trigger and an outcome. Rather, motivated reasoning has mainly been examined as a trigger of reactions (e.g., Agrawal & Maheswaran, 2005), or has been examined as an outcome of other triggers (e.g., Paharia et al., 2013). Thus, it has not been comprehensively investigated how motivated reasoning influences behavioural decisions as a process (mediation). In this paper, motivated reasoning will be the mediator to show the process of how other factors influence the purchase decision of voluntary carbon offsets.

Through motivated reasoning, individuals could be less inclined to enact compensatory behaviour (Welsh et al., 2020). As the moral self-regulation framework suggests, when moral self-worth decreased, moral cleansing is likely to happen. Nevertheless, the emergence of moral cleansing is not certain (Wang, Xiao, & Ren, 2022). Once the threat toward the moral self-concept is attenuated, the cognitive dissonance is expected to be relieved. For instance, research indicates that individuals who feel immoral will not be pursuing pro-social compensation after they cleansed themselves physically (Gino, Kouchaki, & Galinsky, 2015), and another study even shows that motivated reasoning would lead to more unethical decisions (Welsh et al., 2020). Thus, with higher levels of motivated reasoning, people tend to justify their behaviour more and are expected to face fewer threats to their moral self-concept, thus they are less likely to engage in compensatory

behaviour. In the context of taking a flight, after realizing the negative consequences of flying on the environment, air travellers are expected to be less likely to compensate for the carbon emissions when they have higher levels of motivated reasoning. The engagement of compensation includes several forms of decisions: the purchase intent for a voluntary carbon offset, the amount of money consumers would like to pay for carbon offset (e.g., how much per cent of ticket fee they would like to pay extra for carbon offset), and the percentage of carbon emissions consumers would like to offset (i.e., compensation per cent):

> **Hypothesis 2.** When exposed to information about the negative environmental impact of taking a flight under close social psychological distance, motivated reasoning to protect one's moral self-concept will be higher, which leads to less voluntary carbon offset purchase through reduced (a) purchase intention, (b) willingness to pay, and (c) compensation per cent.

It is worth noting that, the effect of moral self-concepts is not limited to a specific domain, context, or situation. A change of moral self-worth in one situation or area could even affect the following behaviour in another situation or area. For example, a study reported that people who donated to charity subsequently expressed lower intentions for pro-environmental behaviour (Meijers, Verlegh, Noordewier, & Smit, 2015), and another study found that residents who decreased water consumption increased their electricity consumption (Tiefenbeck, Staake, Roth, & Sachs, 2013). Given that the effect of moral self-concepts is cross-contextual, the effect of motivated reasoning is not limited to voluntary carbon offsets only, but is expected to have a contagion effect on more general pro-environmental behaviour:

> **Hypothesis 3.** When exposed to information about the negative environmental impact of taking a flight under close social psychological distance, motivated reasoning to protect one's moral self-concept will be higher, which leads to less (a) low-effort and

(b) high-effort pro-environmental behaviours.

3.2.4. Outlines of studies

The current research consists of three studies to test the three hypotheses separately (see Table 3.2). A vacation by air is employed as the experience in this research, thus the social psychological distance is the perceived distance between consumers' self and the vacation. Study one is conducted to explore, for consumers who know the negative environmental impact of taking a flight, whether they will be inclined to justify the behaviour of taking a flight. Also, study one tests whether the motivation to justify will be stronger when the social psychological distance is close, as opposed to distant social psychological distance. Study two aims to test whether higher levels of such motivated reasoning will lead to lower sustainable consumption. Specifically, consumers who have higher levels of justification toward the behaviour of taking a flight can rationalise their behaviour more. Such that, self-serving justifications can relieve the threat to the moral self-concept. At last, study three tested the contagion effect of such self-serving justifications. To be specific, we expect that the self-serving justifications consumers get from the airline service context can also decrease the perceived necessity to conduct general pro-environmental behaviours. To conclude, the current research is to explore consumers' resistance to purchasing voluntary carbon offsets through a lens of motivated reasoning and social psychological distance (see Figure 3.1).

Table 3.2 Overview of the current research

Study	Moderator	Mediator	Dependent Variable	Hypothesis	Research Aim
One	Social psychological distance	N/A	Motivated reasoning	H1	To test when presented with information about the negative environmental impact of a service, whether consumers will have higher motivated reasoning when the social psychological distance is close.
Two	Social psychological distance	Motivated reasoning	Voluntary carbon offset purchase	H1; H2a, b, and c	To test whether the level of motivated reasoning for past 'vice' purchase behaviour can decrease the necessity to conduct 'virtue' behaviour in the same consumption context.
Three	Social psychological distance	Motivated reasoning	Low- and high-effort pro-environmental behaviour	H1; H3a and b	To test whether the level of motivated reasoning for past 'vice' purchase behaviour can decrease the necessity to conduct 'virtue' behaviour in other contexts.

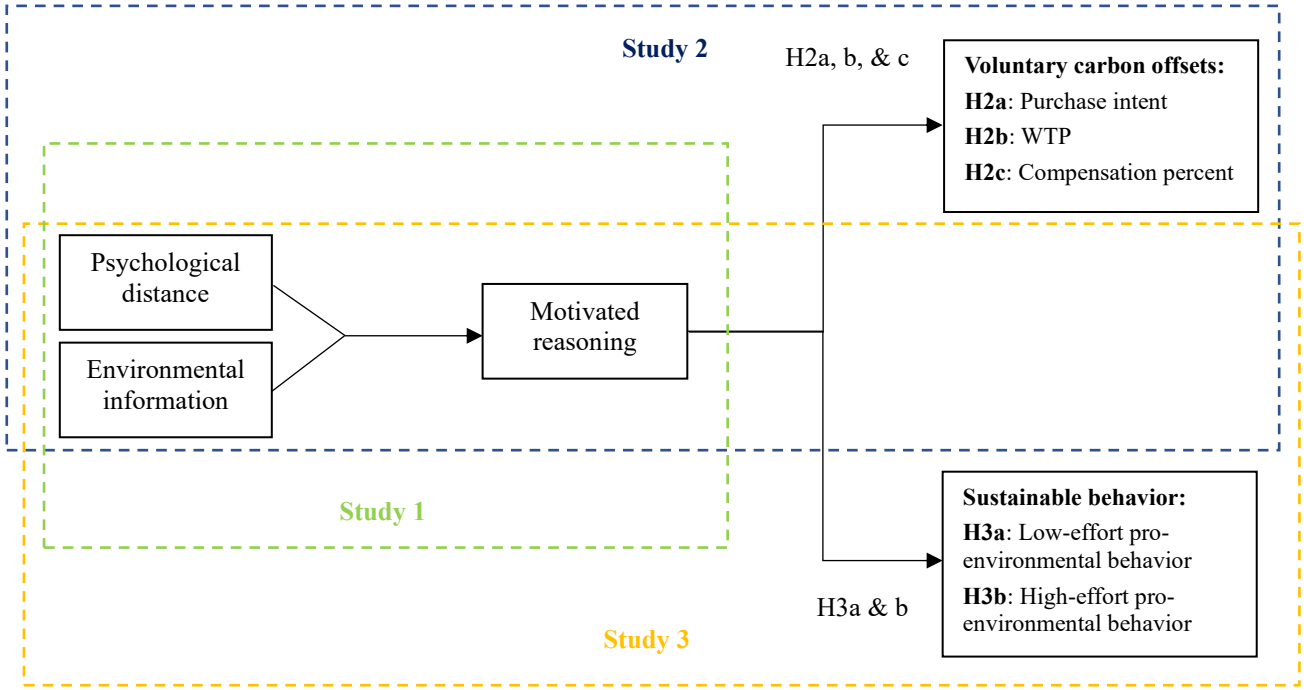


Figure 3.1 Conceptual framework of the current research

3.3. Study One

Study one tested whether the agreement with self-serving justifications for a service

associated with negative environmental impact would differ as a function of social psychological distance, thus the level of motivation to protect one's moral self-concept varied due to different social psychological distances. As hypothesis one states, it is expected that participants would agree more with self-serving justifications after considering the environmental cost of taking a flight when the social psychological distance is relatively close. In this study, self-serving justifications are operationally defined as reasonable statements that can get rid of or alleviate personal responsibility to protect the environment or rationalise the behaviour with negative environmental consequences. Commonly used self-serving justification reasons in sustainable tourism area include denial of responsibility (e.g., myself as a single person is powerless), denial of control (e.g., I am not rich enough), compensation through benefits (e.g., I am doing good in other places), etc. (Juvan & Dolnicar, 2014).

3.3.1. Method

Two hundred and nineteen participants (52 males, M_{age} = 38.3) who live in the UK were recruited on Prolific in exchange for a participation fee. When asked "how frequently do you travel in a normal year (without a pandemic)?", only 19 participants answered "never", while all other participants have at least some travelling. In a 2×2 between-subjects design, participants were randomly assigned to one of four conditions: close vs. distant (primed social psychological distance), crossed with environmental information present vs. absent.

To prime different social psychological distances, all participants' first task was to read information about a vacation. According to construal level theory (Trope & Liberman, 2010), people tend to conceptualise an object at a distant psychological distance at high-level construals that focuses on essential, abstract, and global features, whereas psychologically closer objects are represented at low-level construals that concentrate on concrete, peripheral, and local features (Trope et al., 2007). In addition, when imagined from the first-person perspective, objects are

perceived to be psychologically closer than from the third-person perspective (Eyal, Liberman, & Trope, 2008; Pronin & Ross, 2006; Zezelj & Jokic, 2014). Thus, in the close social psychological condition, the narrative is based on a first-person perspective and includes "contextualized representations that include subordinate and incidental features of events" (Trope et al., 2007, p. 83).

In the close condition, participants read the text: "Imagine after several hard-working months or a hard semester, you and your friends just had a nice week-long vacation at a seaside resort. At the resort, you swam and dived, went on sailing or fishing trips, basked on the beach, took a hot air balloon ride, and enjoyed the nightlife there. You are feeling relaxed and refreshed after a week away from the challenges of work or study." After reading this text, to make sure the close social psychological distance was primed properly, participants in the close condition were also asked to rank the experiences listed in the text based on how much they liked them.

In the distant condition, participants read the text: "Imagine after several hard-working months or a hard semester, your friends just had a nice week-long vacation at a seaside resort. At the resort, they had fun. Your friends took a flight to the resort, and after the week-long vacation, they also took a flight back."

All participants then read about airline information in a website-like format (see Appendix A). In the environmental information present condition, participants were presented with information about the environmental cost of taking a flight while in the environmental information absent condition, participants were presented with neutral information (i.e., production quantity of different aeroplanes).

To measure the level of motivated reasoning, participants then indicated their agreement with commonly used self-serving justifications in the sustainable tourism area (Juvan & Dolnicar, 2014). The Justification of Negative Environmental Behaviors (JNEB) scale was adapted and applied in this research (Hansmann & Binder, 2021), which consists of four items: There are more

important things in life than protecting the environment, so to a certain extent it is justified to take a flight frequently; The impact of a single person's behaviour is small, so it is not worth limiting oneself for the environment; I behave very environmentally friendly in most areas of life, so it is okay to take a flight for my vacation; Eco-friendly behaviour is often more expensive, so it is okay if I pollute the environment through some behaviours (such as flying to a holiday destination now and then instead of travelling more expensively by train) (1 = Strongly disagree; 7 = Strongly agree). The justification measures were collapsed into one justification index (α = .75). At last, participants answered demographic questions and were thanked.

3.3.2. Result

A 2 × 2 analysis of variance (ANOVA) is processed with the two factors of social psychological distance (close vs. distant) and environmental information (present vs. absent) as the independent variables, and the justification index as the dependent variable.

Table 3.3 Study one results of ANOVA

Factors	**df**	**Mean Square**	**F**	**p-value**	**Cohen's d**
A. Environmental information	1	10.57	10.77	0.001	0.443
B. Social psychological distance	1	4.26	4.34	0.038	0.282
A × B	1	7.92	8.06	0.005	0.436
Error	215	0.98			

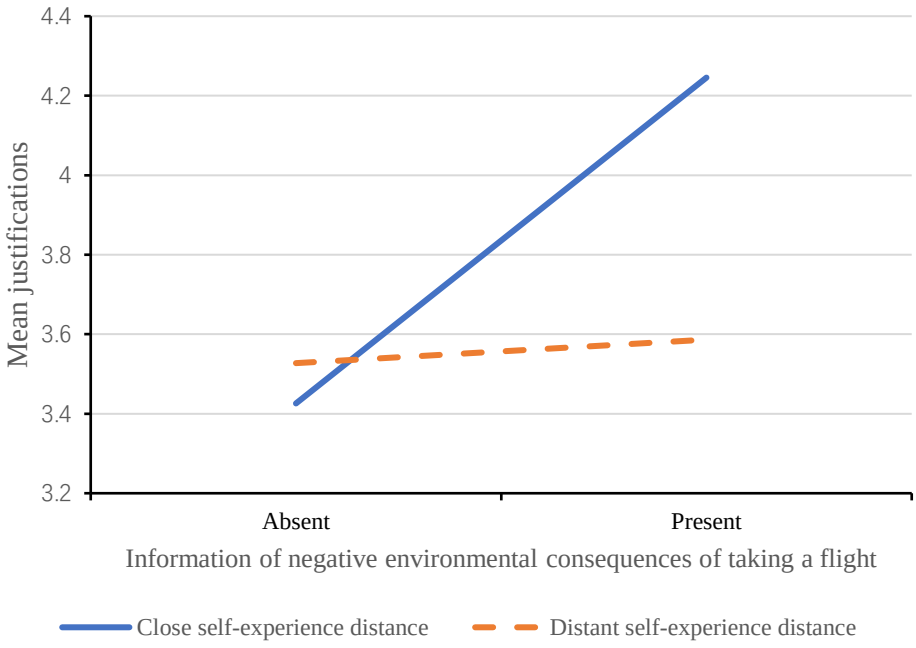


Figure 3.2 Agreement with justifications as a function of social psychological distance and the presence of environmental information

This model revealed the predicted interaction between the social psychological distance and environmental information ($F_{A\times B\ (1,\ 215)} = 8.06$, $p = .005$, $d = .436$) (see Table 3.3). The main effects of social psychological distance and environmental information are also significant ($F_{A\ (1,\ 215)} = 10.77$, $p = .001$, $d = .443$ and $F_{B\ (1,\ 215)} = 4.34$, $p = .038$, $d = .282$ respectively). As seen in Figure 3.2, simple effects showed that, as predicted, when the information on the negative environmental impact of taking a flight was present, participants indicated greater agreement with self-serving justifications when considering the vacation under a close social psychological distance ($M_{close} = 4.25$, $SD_{close} = 1.1$ vs. $M_{distant} = 3.59$, $SD_{distant} = .94$, $t_{108} = 3.39$, $p < .001$, $d = .646$). Also as predicted, there was no significant difference in agreement with self-serving justifications between close and distant social psychological distance when there was no environmental information shown ($M_{close} = 3.43$, $SD_{close} = .95$ vs. $M_{distant} = 3.53$, $SD_{distant} = .96$, $t_{107} = -.55$, $p = .582$, $d = -.106$).

3.3.3. Discussion

Study one showed that participants reported greater agreement with self-serving justifications when considering the severe negative environmental impact of taking a flight under close social psychological distance, which confirms H1. In study two, we sought to connect the use of self-serving justifications to purchase decisions to show that participants who endorsed self-serving justifications more could relieve the threats towards moral self-concept more, then they would feel less necessary for purchasing voluntary carbon offsets.

3.4. Study Two

Study one found that participants are motivated to agree with self-serving justifications based on social psychological distance. When participants realise the environmental cost of taking a flight, especially compared with other transport modes, participants who feel a closer psychological connection with the vacation by air are more inclined to justify their behaviour of taking a flight to a vacation. It remains to be seen whether the effect is strong enough to affect consumer spending on voluntary carbon offsets. To this end, study two advances the research one step further. Study two examines differences in consumers' purchase decisions of voluntary carbon offsets as a function of motivated reasoning. As hypothesis two states, motivated reasoning is estimated as a function of environmental information, with the effect of environmental information on motivated reasoning modelled related to social psychological distance, and the purchase decisions of voluntary carbon offsets are estimated as a function of motivated reasoning.

3.4.1. Method

Two hundred and twenty participants (46 males, M_{age} = 39.6) who live in the UK were recruited on Prolific in exchange for a participation fee. When asked "how frequently do you

travel in a normal year (without a pandemic)?", only 19 participants answered "never", while all other participants have at least some travelling. In a 2×2 between-subjects design, participants were randomly assigned to one of four conditions: close vs. distant (primed social psychological distance), crossed with environmental information present vs. absent.

The experiment procedure and manipulations were the same as it was in study one, except for two differences. First, to rule out the possible effect of the information about the production quantity of different aeroplanes, consumers in the condition of environmental information absent no longer saw this information, and no other information was presented to replace either. Second, after completing the JNEB scale (α = .794), participants were presented with the introduction of a carbon offsets project (see Appendix B) and then were asked to answer three questions associated with the purchase of voluntary carbon offsets.

The three questions associated with the purchase of voluntary carbon offsets correspond to purchase intent, willingness to pay, and compensation per cent: (purchase intent) "To what extent do you intend to buy the carbon offset when you book your next flight?" (From 1- extremely unlikely to 7 - extremely likely); (willingness to pay) "What percentage of your flight ticket fee would you like to add for buying carbon offset for your next flight?" (From 0 to 100); (compensation per cent) "Now the airline company introduces a new way of buying carbon offset, by which customers can not only choose full compensation or no compensation but also can choose the percentage of the CO_2 emissions they want to compensate partially. What percentage of the CO_2 emissions would you like to compensate by buying a carbon offset for your next flight?" (From 0 to 100). At last, participants answered demographic questions and were thanked.

3.4.2. Result

The descriptive statistics results are presented in Table 3.4. A 2 × 2 analysis of variance (ANOVA) is processed with the two factors of social psychological distance (close vs. distant) and

environmental information (present vs. absent) as the independent variables, and the justification index as the dependent variable (see Table 3.5). This analysis shows the same results as study one. The predicted interaction between the social psychological distance and environmental information ($F_{A\times B\ (1,\ 216)} = 4.96$, $p = .027$, $d = .318$) (see Table 3.5) is significant. The main effects of social psychological distance and environmental information are also significant ($F_{A\ (1,\ 216)} = 5.70$, $p = .018$, $d = .319$ and $F_{B\ (1,\ 216)} = 5.13$, $p = .027$, $d = .318$ respectively). As predicted, when the information on the negative environmental impact of taking a flight was present, participants indicated greater agreement with self-serving justifications when considering the vacation under a close social psychological distance ($M_{close} = 4.33$, $SD_{close} = 0.95$ vs. $M_{distant} = 3.72$, $SD_{distant} = 1.10$, $t_{107} = 3.15$, $p = .002$, $d = .603$). There was no significant difference in agreement with self-serving justifications between close and distant social psychological distance when there was no environmental information shown ($M_{close} = 3.70$, $SD_{close} = 1.03$ vs. $M_{distant} = 3.70$, $SD_{distant} = 1$, $t_{109} = .028$, $p = .978$, $d = .005$).

Table 3.4 Descriptive statistics for study two

Factor	N	Mean	SD
Motivated reasoning	220	3.86	1.05
Purchase intent	220	5.70	0.60
Willingness to pay	220	11.31	11.1
Compensation per cent	220	37.29	34.44

Table 3.5 Study two results of ANOVA

Factors	df	Mean Square	F	p-value	Cohen's d
A. Environmental information	1	5.95	5.70	0.018	0.319
B. Social psychological distance	1	5.36	5.13	0.024	0.296
A × B	1	5.17	4.96	0.027	0.318
Error	216	1.04			

Table 3.6 Study two results of moderated mediation for purchase decisions

		Motivated reasoning (*M*)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.068$	Constant	3.701	0.137	27.110	< .001
F (3, 216) = 5.264	Environ. information (*X*)	0.636	0.194	3.277	0.001
p = .002	Social psychological distance (W)	-0.005	0.194	-0.028	0.978
	M × *W*	-0.613	0.276	-2.226	0.027

		Purchase intent (Y_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.058$	Constant	6.225	0.152	40.881	< .001
F (2, 217) = 6.728	Environ. information (*X*)	0.035	0.081	0.436	0.663
p = .002	Motivated reasoning (*M*)	-0.141	0.038	-3.665	< .001
		Conditional Indirect Effects of X on Y_1			
	Levels of moderator	β	SE	LLCI	ULCI
	Close social psychological distance	-0.089	0.038	-0.172	-0.024
	Distant social psychological distance	-0.003	0.029	-0.061	0.056
		Index of moderated mediation			
		Index	SE	LLCI	ULCI
	Social psychological distance	0.086	0.048	0.007	0.193

		Willingness to pay (Y_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.073$	Constant	20.807	2.781	7.482	< .001
F (2, 217) = 8.556	Environ. information (*X*)	2.548	1.467	1.736	0.084
p < .001	Motivated reasoning (*M*)	-2.786	0.699	-3.982	< .001
		Conditional Indirect Effects of X on Y_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Close social psychological distance	-1.771	0.862	-3.774	-0.445
	Distant social psychological distance	-0062	0.603	-1.246	1.222
		Index of moderated mediation			
		Index	SE	LLCI	ULCI
	Social psychological distance	1.709	1.082	0.117	4.357

		Compensation per cent (Y_3)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.096$	Constant	75.982	8.513	8.925	< .001
F (2, 217) = 11.531	Environ. information (*X*)	1.879	4.492	0.419	0.676
p < .001	Motivated reasoning (*M*)	-10.258	2.142	-4.789	< .001
		Conditional Indirect Effects of X on Y_3			
	Levels of moderator	β	SE	LLCI	ULCI
	Close social psychological distance	-6.519	2.324	-11.412	-2.517
	Distant social psychological distance	-0.227	2.123	-4.669	3.849
		Index of moderated mediation			
		Index	SE	LLCI	ULCI
	Social psychological distance	6.292	2.982	0.896	12.716

Note: β = unstandardised regression coefficient, SE = standard error, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval.

Based on the ANOVA analysis, hypothesis one is supported again. As for hypothesis two, it states that, the joint effect of environmental information and social psychological distance on the purchase of voluntary carbon offsets is mediated by motivated reasoning. That is to say, the indirect effect of environmental information on the purchase decisions of voluntary carbon offsets via motivated reasoning is conditional on the level of social psychological distance (i.e., moderated mediation). The process to test the hypothesis about mediated moderation was modelled with two equations, one for motivated reasoning (*M*) and another one for the purchase of voluntary carbon offsets (*Y*) (Hayes, 2013):

(1) $M = i_M + a_1X + a_2W + a_3XW + e_M$

(2) $Y = i_Y + c'X + bM + e_Y$

where *X* represents the independent variable (i.e., environmental information), *M* refers to the mediator (i.e., motivated reasoning), and *Y* is the dependent variable (i.e., purchase decisions of voluntary carbon offsets), and meanwhile, *W* represents the moderator (i.e., social psychological distance). The coefficients for each predictor in the model can be estimated using an ordinary least squares regression program (Hayes, 2015).

The estimated regression coefficients for purchase decisions are displayed in Table 3.6 and Figure 3.3 (executed by PROCESS macro for SPSS version 4.0, 95% bootstrap confidence interval based on 5,000 bootstrap samples). As can be seen, the interaction between environmental information and social psychological distance can significantly affect the level of motivated reasoning (a_3 = -0.613, 95% CI = -1.156 to -0.071, p = .027). To be specific, participants who were primed with close social psychological distance tended to agree more with self-serving justifications when presented with the environmental cost of taking a flight ($F_{(1, 216)}$ = 4.96, p = .027). Also shown in Table 3.6, the indirect effect of environmental information on purchase intentions via motivated reasoning is significant for purchase intent (b = -0.141, 95% CI = -0.216 to -0.065, p < .001), willingness to pay (b = -2.786, 95% CI = -4.165 to -1.407, p < .001), and

compensation per cent (b = -10.258, 95% CI = -14.479 to -6.037, p < .001). When examining the indirect effect of environmental information on purchase intentions, the direct effect of environmental information becomes non-significant, thus it suggests that the mediating effect of motivated reasoning is full mediation.

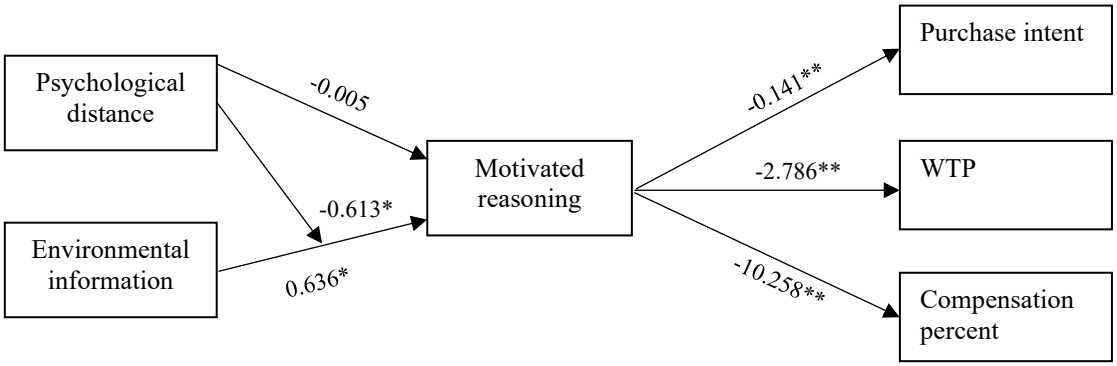


Figure 3.3 Conceptual framework of study two with statistical results

Note: * means p < .05, ** means p < .001

However, the evidence of a significant indirect effect of X on Y via M did not necessarily establish whether the indirect effect of X on Y depends on W, because their relationship was not estimated with a_3. The indirect effect in this model of X on Y through M (ω in the notation below) is the product of the conditional effect of X on M from Equation (1) and the effect of M on Y controlling for X in Equation (2):

$$(3)\ \omega = a_1 b + a_3 b W$$

Based on equation (3), ω is a linear function of W with intercept $a_1 b$ and slope $a_3 b$. The value of W in this study is set as 0 (close distance) and 1 (distant distance). The results of the conditional process analysis (PROCESS Macro) show that only when the social psychological distance is close (i.e., W = 0), the indirect effects of environmental information on purchase intent (ω = -0.089, 95% CI = -0.172 to -0.024), willingness to pay (ω = -1.77, 95% CI = -3.774 to -0.445), and compensation per cent (ω = -6.519, 95% CI = -11.412 to -2.517) are significant. In addition, Hayes (2015) named $a_3 b$ the index of moderated mediation for this model. A conditional process analysis for the index of moderated mediation that does not include zero provided direct and definitive

evidence for the moderated mediation: purchase intent (B = 0.086, 95% CI = 0.007 to 0.193), willingness to pay (B = 1.709, 95% CI = 0.117 to 4.357), and compensation per cent (B = 6.292, 95% CI = 0.896 to 12.716). Thus, it could be concluded (with 95% confidence) that there is a conditional indirect effect, that is, the indirect effect of environmental information on the purchase intentions of voluntary carbon offsets via motivated reasoning is conditional on the level of social psychological distance. To be specific, when participants perceived a close social psychological distance with the vacation by air, knowing the environmental cost of taking a flight can produce higher levels of agreement with self-serving justifications, which led to lower purchase intent, lower willingness to pay, and lower compensation per cent toward voluntary carbon offsets.

3.4.3. Discussion

Study two confirmed that participants reported greater agreement with self-serving justifications when they perceived closer psychological distance to the vacation by air after being presented with the negative environmental impact of taking a flight, which is consistent with H1. Further, study two found that the indirect effect of environmental information on purchase intentions via motivated reasoning is significant only when the social psychological distance is close. Specifically, after being presented with the environmental cost of taking a flight, participants who had closer social psychological distance with the vacation by air indicated greater agreement with self-serving justifications, thus, because the self-serving justification mitigates the threats toward their moral self-concept, they had lower purchase intent and willingness to pay for voluntary carbon offsets, and were less likely to compensate carbon emissions through purchasing voluntary carbon offsets. The findings of study two are consistent with H2, then study three was conducted to explore the contagion effect of such conditional indirect effect.

3.5. Study Three

Study one and study two suggested that participants who were primed with close social psychological distance to the vacation by air indicated greater agreement with self-serving justifications after being presented with the negative environmental impact of taking a flight, and subsequently, these participants were less likely to pay for voluntary carbon offsets. Study three was set up to explore whether this effect can spread to behaviour beyond the purchase of voluntary carbon offsets. As hypothesis three suggested, since the strong motivation to justify the behaviour of taking a flight can attenuate the threats toward moral self-concept, and the effect of moral self-concept is not limited to a narrow domain or context (Meijers et al., 2015; Tiefenbeck et al., 2013), consumers who have higher levels of justifications toward the behaviour of taking a flight would also feel less important or urgent to conduct other pro-environmental behaviour.

3.5.1. Method

Two hundred and four participants (42 males, M_{age} = 37.8) who live in the UK were recruited on Prolific in exchange for a participation fee. In a 2×2 between-subjects design, participants were randomly assigned to one of four conditions: close vs. distant (primed social psychological distance), crossed with environmental information present vs. absent.

The experiment procedure and manipulations were the same as it was in study two, except for one difference. After completing the JNEB scale (α = .808), participants were not seeing the questions about voluntary carbon offsets but were presented with two scales instead. One is a low-effort pro-environmental behaviour scale, and another is a high-effort pro-environmental behaviour scale (Wu, Font, & Liu, 2021). The low-effort pro-environmental behaviour scale measures the intention of performing four kinds of pro-environmental behaviour that correspond to four items: “conserve resource and energy”, “recycle”, “sort garbage”, and “use ‘green’ (non-plastic) shopping bags”, while the high-effort pro-environmental behaviour scale measures the

intention of performing other four kinds of pro-environmental behaviour that correspond to four items as well: “remind others to avoid doing environmentally harmful behaviours”, “look for environmental information on TV, in print, or on the Internet”, “donate money to support environmental conservation, and “volunteer my time to projects that help the environment”. The low-effort and high-effort pro-environmental behaviour measures were collapsed into one index respectively: low-effort (α = .649) and high-effort (α = .824). At last, participants answered demographic questions and were thanked.

3.5.2. Result

The descriptive statistics results are presented in Table 3.7. A 2 × 2 analysis of variance (ANOVA) is processed with the two factors of social psychological distance (close vs. distant) and environmental information (present vs. absent) as the independent variables, and the justification index as the dependent variable (see Table 3.8). This analysis shows the same results as studies one and two. The predicted interaction between the social psychological distance and environmental information ($F_{A\times B\ (1,\ 200)} = 6.67$, $p = .011$, $d = .333$) (see Table 3.8) is significant. The main effects of social psychological distance and environmental information are also significant ($F_{A\ (1,\ 200)} = 5.96$, $p = .015$, $d = .333$ and $F_{B\ (1,\ 200)} = 6.34$, $p = .013$, $d = .340$ respectively). As predicted, when the information on the negative environmental impact of taking a flight was present, participants indicated greater agreement with self-serving justifications when considering the vacation under a close social psychological distance ($M_{\text{close}} = 4.41$, $SD_{\text{close}} = 0.93$ vs. $M_{\text{distant}} = 3.71$, $SD_{\text{distant}} = 0.89$, $t_{100} = 3.86$, $p < .001$, $d = .764$). There was no significant difference in agreement with self-serving justifications between close and distant social psychological distance when there was no environmental information shown ($M_{\text{close}} = 3.72$, $SD_{\text{close}} = 1.02$ vs. $M_{\text{distant}} = 3.73$, $SD_{\text{distant}} = 1.04$, $t_{100} = -.043$, $p = .966$, $d = -.009$).

Based on the ANOVA analysis, hypothesis one is supported again. As for hypothesis three, it

states that, the joint effect of environmental information and social psychological distance on the performance intention of low-effort and high-effort behaviour is mediated by motivated reasoning. That is to say, the indirect effect of environmental information on the performance intention of low-effort and high-effort behaviour via motivated reasoning is conditional on the level of social psychological distance (i.e., moderated mediation). The process to test the hypothesis about the mediated moderation was modelled with equations (1) and (2), but this time *Y* is two different dependent variables (i.e., performance intention of low-effort and high-effort pro-environmental behaviour).

Table 3.7 Descriptive statistics for study three

Factor	N	Mean	SD
Motivated reasoning	204	3.89	1.01
Low-effort pro-environmental behaviour	204	5.53	0.48
High-effort pro-environmental behaviour	204	3.95	0.94

Table 3.8 Study three results of ANOVA

Factors	df	Mean Square	F	p-value	Cohen's d
A. Environmental information	1	5.66	5.96	0.015	0.333
B. Social psychological distance	1	6.02	6.34	0.013	0.340
A × B	1	6.33	6.67	0.011	0.333
Error	200	0.95			

The estimated regression coefficients for performance intention of low-effort and high-effort pro-environmental behaviour are displayed in Table 3.9 and Figure 3.4 (executed by PROCESS macro for SPSS version 4.0, 95% bootstrap confidence interval based on 5,000 bootstrap samples). As can be seen, the interaction between environmental information and social psychological distance can significantly affect the level of motivated reasoning (a_3 = -0.705, 95% CI = -1.243 to -0.167, p = .011). To be specific, participants who were primed with close social psychological distance tended to agree more with self-serving justifications when presented with the environmental cost of taking a flight ($F_{(1, 200)}$ = 6.67, p = .011). Also shown in Table 3.9, the indirect effect of environmental information on the performance intention of pro-environmental

behaviour via motivated reasoning is significant for low-effort behaviour (b = -0.139, 95% CI = -0.202 to -0.075, p < .001) and high-effort behaviour (b = -0.308, 95% CI = -0.431 to -0.184, p < .001). When examining the indirect effect of environmental information on the performance intention of both low-effort and high-effort behaviour, the direct effect of environmental information becomes non-significant, thus it suggests that the mediating effect of motivated reasoning is full mediation.

Table 3.9 Study three results of moderated mediation for pro-environmental behaviour

		Motivated reasoning (M)			
Model summary	Predicting variables	β	SE	t	p
R^2 = 0.087	Constant	3.721	0.135	27.532	< .001
F (3, 200) = 6.325	Environ. Information (X)	0.686	0.192	3.571	< .001
p < .001	Social psychological distance (W)	0.009	0.193	0.046	0.964
	$M \times W$	-0.705	0.273	-2.582	0.011
		Low-effort pro-environmental behaviour (Y_1)			
Model summary	Predicting variables	β	SE	t	p
R^2 = 0.089	Constant	6.011	.128	46.908	< .001
F (2, 201) = 9.887	Environ. Information (X)	0.117	0.065	1.804	0.073
p < .001	Motivated reasoning (M)	-0.139	0.032	-4.306	< .001
		Conditional Indirect Effects of X on Y_1			
	Levels of moderator	β	SE	LLCI	ULCI
	Close social psychological distance	-0.095	0.035	-0.171	-0.034
	Distant social psychological distance	0.003	0.027	-0.053	0.054
		Index of moderated mediation			
		Index	SE	LLCI	ULCI
	Social psychological distance	0.098	0.043	0.021	0.188
		High-effort pro-environmental behaviour (Y_2)			
Model summary	Predicting variables	β	SE	t	p
R^2 = 0.111	Constant	5.163	0.249	20.668	< .001
F (2, 201) = 12.559	Environ. Information (X)	-0.027	0.127	-0.216	0.829
p < .001	Motivated reasoning (M)	-0.308	0.063	-4.903	< .001
		Conditional Indirect Effects of X on Y_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Close social psychological distance	-0.211	0.076	-0.372	-0.079
	Distant social psychological distance	0.006	0.061	-0.111	0.128
		Index of moderated mediation			
		Index	SE	LLCI	ULCI
	Social psychological distance	0.217	0.097	0.051	0.423

Note: β = unstandardised regression coefficient, SE = standard error, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval.

Again, the evidence of a significant indirect effect of *X* on *Y* via *M* did not necessarily establish whether the indirect effect of *X* on *Y* depends on *W*. Based on equation (3), ω is a linear function of *W* with intercept a_1b and slope a_3b. The value of *W* in this study is set as 0 (close distance) and 1 (distant distance). The results of the conditional process analysis (PROCESS Macro) show that only when the social psychological distance is close (i.e., $W = 0$), the indirect effects of environmental information on low-effort pro-environmental behaviour (ω = -0.095, 95% CI = -0.171 to -0.034), and high-effort pro-environmental behaviour (ω = -0.211, 95% CI = -11.412 to -2.517) are significant. In addition, the conditional process analysis for the index of moderated mediation (i.e., a_3b) that does not include zero provided direct and definitive evidence for the moderated mediation: low-effort pro-environmental behaviour (B = 0.098, 95% CI = 0.021 to 0.188) and high-effort pro-environmental behaviour (B = 0.217, 95% CI = 0.051 to 0.423). Thus, it could be concluded (with 95% confidence) that there is a conditional indirect effect, that is, the indirect effect of environmental information on both low-effort and high-effort pro-environmental behaviour via motivated reasoning is conditional on the level of social psychological distance. To be specific, when participants perceived a close social psychological distance with the vacation by air, knowing the environmental cost of taking a flight can produce higher levels of agreement with self-serving justifications, which led to lower performance intention of both low-effort and high-effort pro-environmental behaviour.

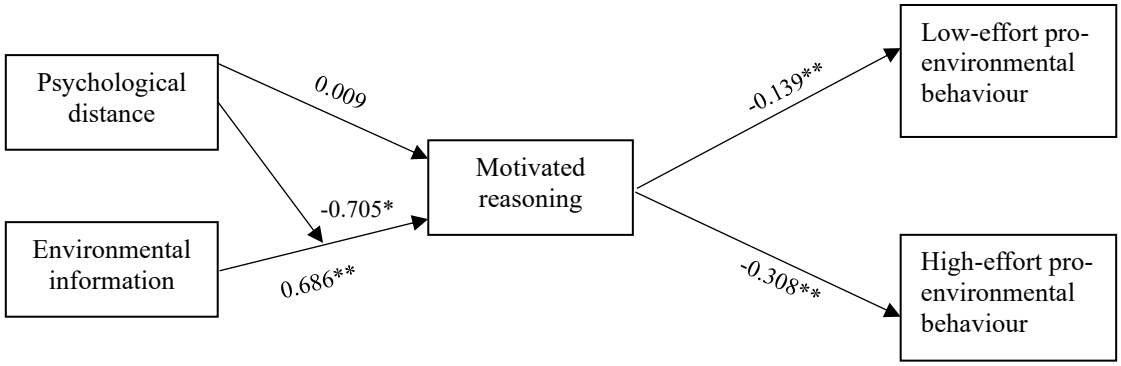


Figure 3.4 Conceptual framework of study three with statistical results

Note: * means $p < .05$, ** means $p < .001$

3.5.3. Discussion

Study three again confirmed that after being presented with the negative environmental impact of taking a flight, participants who perceived closer psychological distance to the vacation by air reported greater agreement with self-serving justification, which is consistent with H1. Further, study three found that the indirect effect of environmental information on both low-effort and high-effort pro-environmental behaviour via motivated reasoning is significant only when social psychological distance is close. Specifically, when emphasised the environmental cost of taking a flight, participants who feel a closer psychological connection with the vacation by air indicated greater agreement with self-serving justifications for their behaviour of taking a flight, thus they would have lower performance intention of both low-effort and high-effort pro-environmental behaviour because the self-serving justification alleviates the threats toward their moral self-concept, which is consistent with H3.

3.6. General Discussion

To contain carbon emissions from flights, voluntary carbon offsets have been employed by many airline companies (Guix et al., 2022). Though people say they care about environmental protection, yet less than 10% of air passengers purchase them (Zhang et al., 2019). Prior research mainly argues that consumers are not buying carbon offsets because they are not aware of this product. However, the purchase rate of carbon offsets is significantly lower than the awareness of this product. Hence, previous research fails to explain why some consumers do not engage in voluntary carbon offsets even after being aware of it. To address this deficiency, this paper aims to identify a cognitive process by which consumers stay in cognitive comfort without taking responsibility for protecting the environment.

Through three online experiments, this research provides one possible mechanism for explaining why the purchase rate of aviation voluntary carbon offsets is low. Three hypotheses are

supported by three studies, which find that cognitive resources can be used in the service of motivated reasoning when considering carbon emissions in the context of self-relevant experience, that is, vacation in this research (see Table 3.10). In study one, an interaction effect of environmental information and social psychological distance on motivated reasoning was detected. Results show that close psychological distance associated with an experience can trigger a strong motivation to justify one's environmentally detrimental behaviour. To be specific, when emphasising the environmental cost of taking a flight, participants who felt closely psychological-connected with the vacation by air were motivated more to justify their carbon emissions from taking a flight. In study two, this effect was confirmed again, and study two further suggested the effect of motivated reasoning on the purchase outcomes of voluntary carbon offsets. Participants who felt more social-psychologically close to the vacation by air, had higher levels of motivated reasoning, which decreased their interest in purchasing voluntary carbon offsets. And in study three, we found that the justifications for taking a flight can not only decrease the likelihood of purchasing voluntary carbon offsets but can also reduce the likelihood of performing general pro-environmental behaviour.

Table 3.10 Summary of hypotheses testing

Hypothesis	Study	Result	Remark
H1	Study 1, 2, and 3	Supported	Close social psychological distance strengthens the motivation to justify environmentally-detrimental purchase behaviour.
H2	Study 2	Supported	Higher justification for environmentally-detrimental travel consumption leads to less possibility of making sustainable travel decisions.
H3	Study 3	Supported	Higher justification for environmentally-detrimental travel consumption leads to less possibility of conducting general pro-environmental behaviour.

3.6.1. Theoretical implications

This research contributes to the literature on voluntary carbon offsets. Prior research cannot explain why the purchase rate of voluntary carbon offsets is substantially lower than the awareness

rate of it. This research tries to answer this question by exploring the essential role of motivated reasoning in decreasing the purchase of voluntary carbon offsets. Motivated reasoning refers to the tendency leading to self-serving justifications or decisions based on personal goals or motives rather than an accurate reflection of the evidence, through which people can reach the conclusions they prefer and protect their self-concept (Kunda, 1990). Thus, consumers who feel stronger threats toward their moral self-concept, have stronger motivations to justify their 'vice' consumption. This paper empirically tests this idea in the context of aviation voluntary carbon offsets, which shows the mediation effect of motivated reasoning on consumers' purchase decisions. In doing so, this paper identifies a psychological mechanism to elucidate how consumers shift the moral burden away when having non-sustainable consumption, and inspires a new perspective to promote voluntary carbon offsets by constraining motivated reasoning.

This research also contributes to the literature on morality in marketing. Previous research in moral regulation was integrated as the moral self-regulation framework (Sachdeva et al., 2009), which employs the concept of moral self-worth to delineate the decision mechanism of moral actions. When moral self-worth is below an ideal level or standard, people tend to ignite moral cleansing, while they are more likely to ignite moral licensing if moral self-worth is above an ideal level. Nonetheless, an easier way to resolve cognitive dissonance is by changing thoughts without altering behaviour (Festinger, 1962). In moral regulation research, researchers also suggest that people can attenuate the threats toward moral self-concept through cognitive self-serving justifications alone without counting on any behaviour (Shalvi et al., 2015). However, this idea has not been tested particularly or applied widely in consumer psychology, especially in the sustainable consumption context. Prior research either investigated how consumers justify their environmental-unfriendly consumption through past and current deeds (e.g., Barr, Shaw, Coles, & Prillwitz, 2010), or studied consumers' justifications qualitatively (e.g., Árnadóttir, Czepkiewicz, & Heinonen, 2021; Juvan, Ring, Leisch, & Dolnicar, 2016). On the contrary, the preceding research tests the idea of defending moral self-concept through pure cognitive self-serving

justification quantitively in the sustainable consumption context, and how it affects consumers' purchase decision-making.

3.6.2. Practical implications

This research reveals a possible mechanism that explains why consumers do not purchase voluntary carbon offsets. Through motivated reasoning, consumers can attenuate the threats to their moral self-concepts even if they are informed of the environmental cost of taking a flight. Thus, airlines may need to be cautious about how to construct their brand image and how to communicate their pro-environmental endeavours. For instance, if an airline has a strong eco-friendly brand image, consumers can presumably easily shift their moral burden away even by only choosing to fly with this airline. If an airline company communicates its pro-environmental endeavours widely and deeply toward current and potential customers, such as "our airline has purchased new aircraft with better fuel efficiency", consumers can possibly feel higher moral self-worth by purchasing tickets from this airline then they may be less likely to buy voluntary carbon offsets. Therefore, airlines might need to take a more thorough and strategic perspective to build their sustainable strategy and avoid providing a resource or lever for motivated reasoning if they want to promote a specific goal of selling voluntary carbon offsets.

3.6.3. Limitations

Although there are considerable contributions of this essay, there are a few limitations. Firstly, there might be a confounding effect. To prime different social psychological distances, two differences are constructed: one is first-person vs. third-person perspectives, and another one is information at low-level construals vs. high-level construals. As for the first-person perspective, objects are perceived to be psychologically closer than from the third-person perspective (Pronin & Ross, 2006). As for the construal level of information, people tend to conceptualise an object or

message at a distant psychological distance at high-level construals, whereas psychologically closer objects are represented at low-level construals (Trope et al., 2007). Therefore, the psychological distance in this essay is matching an appropriate level of construal or message concreteness, which could lead to a mindset-congruency effect (Connors et al., 2021). That is, the congruency between construal level and psychological distance may make information more persuasive (Trope et al., 2007) and more likely to be accurately stored and retained in memory (Kisielius & Sternthal, 1986). Therefore, the effect detected in the studies may be caused by the consistency between psychological distance and the construal level of information. Further investigation might be needed to confirm whether the effect is conditional on mindset congruency.

Secondly, even though the priming manipulation has been successfully tested to be effective to produce different psychological distances (Paharia et al., 2013; Pronin & Ross, 2006), it is not able to guarantee the occurrence of the priming effect considering the alternative explanation. For instance, pre-existing different attitudes toward sustainability or travelling may cause the different levels of motivated reasoning. Hence, it is not categorically sure the operation of priming in the empirical parts produces the observed results. A pre-test or a manipulation check can help strengthen hypothesis tests through some techniques such as the implicit association test (IAT). This limitation can be overcome by future research with a manipulation check or a pre-test to make sure the effectiveness of priming manipulation.

Thirdly, there might be a bias in the studies since there were no filler tasks in any of the above studies. Filler tasks can be used to provide a cover story to hide the real purpose of the studies from participants (Howitt & Cramer, 2017). If the participants can successfully guess the purpose of the studies, they probably change their responses or decisions in line with what the researcher is after (Harris, 2008). This limitation can be addressed by future studies with appropriate filler tasks.

3.6.4. Future research directions

Future studies could advance the understanding of this area in several directions. First, this research only studied social-psychological distance from one perspective, that is, the social-psychological distance between self and the experience associated with flying. Future research may take other kinds of distance into consideration, such as temporal and spatial distances. In addition, as for social psychological distance per se, rather than the social psychological distance between self and the vacation experience, the distance between self and airlines, the destination of the flights, or the carbon offsetting program can also be intriguing lenses for future research work. Second, another possible research direction could be exploring other possible mechanisms that may explain why consumers do not purchase carbon offsets. Research shows that cognitive load can limit the strength of motivated reasoning (Paharia et al., 2013), thus people cannot always feel free to justify their non-sustainable consumption then they might have other ways to deal with cognitive dissonance from non-sustainable consumption. One possible mechanism could be willful ignorance (Ehrich & Irwin, 2005), for example, when people feel tired or are so excited about the flight, information about the environmental cost of the flight may cause negative emotions such as guilt, then people could ignore this information that can lead to negative emotions. The third suggested future direction can be exploring how to promote voluntary carbon offsets. It is known that immoral consumption can threaten consumers' moral self-concept, which could possibly produce moral cleansing. Thus, future research could explore how to encourage consumers to perform moral cleansing rather than motivated reasoning, especially with close psychological distance. Fourth, the main selling mode of voluntary carbon offsets is 'none or all' but changing the mode of selling may make the situation different. For instance, if airlines can allow passengers to pay for any per cent of the carbon emissions on a continuous spectrum rather than choosing the binary 'none or all', the barriers to joining the carbon offsets project may be reduced, thus more consumers may start purchasing voluntary carbon offsets. In the current research, this new selling mode corresponds to the question about compensation per cent, where motivated reasoning has a

higher coefficient on compensation per cent than purchase intent and WTP. Future research could empirically test this new selling mode.

3.6.5. Conclusion

To conclude, this research quantitatively investigates why consumers are not purchasing carbon offsets even after being aware of them. Through three online experiments, this research delineates a decision process in which motivated reasoning can be activated by the presence of negative environmental information and close social psychological distance. This research further shows that motivated reasoning negatively affects the purchase of voluntary carbon offsets and general pro-environmental behaviour. By identifying this cognitive process of shifting the moral burden away from non-sustainable consumption, this research contributes to the literature on voluntary carbon offsets and morality in marketing.

4. Chapter Four: Essay Three - Being Self-Accountable for Environmental Issues: The Role of Consumer Responsibilisation in Purchasing Airline Voluntary Carbon Offsets

Abstract

Amid growing consumer concerns about air travel's environmental impact, many airlines devise strategies to encourage consumers to offset flights' carbon emissions. While these strategies represent an important commitment towards environmental corporate social responsibility (enCSR), their implementation can be complex. This research identifies a new approach to motivate consumers to purchase voluntary carbon offsets, in which self-accountability priming sequentially triggers environmental responsibilisation and anticipated guilt. Findings of four experimental studies show that consumers who are exposed to self-accountability priming experience higher environmental responsibilisation, which in turn activates anticipated guilt, thus influencing purchase outcomes (study 1). Furthermore, we show that this effect only exists when consumers experience strong biospheric value (i.e., concern for the quality of nature) (study 2), when the perceived enCSR of airlines is high (study 3), and when consumers judge carbon offset projects to be highly credible (study 4). We outline important implications to help companies design effective carbon offset programs for their customers.

Keywords Consumer responsibilisation, self-accountability priming, biospheric value, perceived CSR, perceived credibility, voluntary carbon offsets

4.1. Introduction

Consumers are increasingly more concerned about the carbon footprint of the products and services they receive and are voicing these concerns through targeted purchase decisions (e.g., Gao & Souza, 2022). In line with this trend, to reduce the carbon emissions from flights, many airlines have introduced voluntary carbon offsets for air passengers (Guix, Ollé, & Font, 2022). However, research indicates that the purchase rate of pro-environmental products and services is relatively low (Mahardika, Thomas, Ewing, & Japutra, 2020), and specifically in the airline industry, less than 10% of air passengers purchase voluntary carbon offsets (Zhang, Ritchie, Mair, & Driml, 2019). Thus, a problem marketers face is considering how to encourage consumers to purchase voluntary carbon offsets to ensure the viability of these important environmental CRS initiatives.

Prior studies mainly highlight two approaches through which consumer support for voluntary carbon offsets can be enhanced. First, as many consumers are not clear about what the carbon offset projects are, marketers can help raise consumers' knowledge and awareness of how these voluntary carbon offset projects operate. For instance, some research shows that consumers are more likely to pay for carbon offsets after being explained their advantages clearly (e.g., Denton, Chi, & Gursoy, 2020; Kim, Yun, Lee, & Ko, 2018; Lu & Shon, 2012). Second, while some air passengers might want to reduce carbon emissions when travelling, they might doubt the authenticity and effectiveness of the carbon offset projects. In this context, marketing interventions can help build up a more accessible and transparent information system for the carbon offset project that guarantees its accountability. For example, some research shows formal, external accreditation of carbon offsets projects can increase consumers' purchasing likelihood (e.g., Babakhani, Ritchie, & Dolnicar, 2017; Denton et al., 2020; Liu, Jiang, & Gleasure, 2021).

However, these two approaches focus on external factors while losing sight of the

decision process that leads to consumers offsetting their carbon emissions. Hence, both approaches are not effective enough to encourage the purchase of voluntary carbon offsets. For the first approach, it is clear that consumers need some basic knowledge about the products they buy, nonetheless having knowledge of sustainable products does not necessarily result in a purchase decision (Kang, Liu, & Kim, 2013; Lee, Bae, & Kim, 2020). In addition, different kinds of knowledge may have different effects, suggesting the existence of some potential moderators, which need to be explored further (Kim et al., 2016). As for the second approach, research shows that only a small percentage of the variance in purchase decisions for voluntary carbon offsets can be explained by the credibility of information, implying that other factors should be considered (Zhang et al., 2019).

This research suggests a third approach to promote positive responses to voluntary carbon offsets by drawing upon the consumer responsibilisation literature (Giesler & Veresiu, 2014). Since voluntary carbon offsets transfer the responsibility of counterbalancing the carbon emissions to consumers of air travel, we propose that once consumers internalise this responsibility as self-standards (i.e., become responsibilised consumers), they become more inclined to buy voluntary carbon offsets. Specifically, in contexts where responsibility and self-standards are heightened, anticipated guilt for not counterbalancing the carbon emissions will be subtly activated, and consequently, this anticipated guilt will lead consumers to show a preference for voluntary carbon offsets.

4.1.1. Contributions of the current research

By delineating a new approach to stimulate consumers to purchase voluntary carbon offsets, this research offers three substantive contributions. First, this research contributes to the literature on consumer responsibilisation by introducing a new perspective to understand

consumer responsibilisation. The theory of consumer responsibilisation (Giesler & Veresiu, 2014) explicates consumer responsibilisation as a governmental process underpinned by sociology theoretical streams, and previous marketing research, thus, qualitatively observe (e.g., ethnographic study and interview) the results of such a governmental process (e.g., Cherrier & Türe, 2022; Eckhardt & Dobscha, 2019). By contrast, in current research, we treat consumer responsibilisation as the starting point of a decision-making process and as a psychological status rather than a result of a long-term governmental process. Thus, this article is able to quantitatively test a decision-making process that delineates how consumers decide to buy voluntary carbon offsets. It also identifies a way to practically responsibilise consumers in a more fast and active way, which envisions new possibilities for encouraging and empowering consumers to play a more essential role in sustainability.

Second, this research contributes to the marketing literature on voluntary carbon offsets by identifying a new approach to promote voluntary carbon offsets. The essence of voluntary carbon offsets is passing some responsibility of offsetting the carbon emissions to air travellers (Ritchie, Kemperman, & Dolnicar, 2021), thus this article accords with this idea and identifies a feasible approach to stimulate air travellers to take responsibility for their carbon emissions. Third, this article makes a methodological contribution to the literature on self-accountability by providing a goal-priming design of self-accountability. Self-accountability is defined as "a person's desire to live up to internal self-standards" (Peloza, White, & Shang, 2013, p.105), and based on this definition, researchers use a semantic priming to realise self-accountability priming. Semantic priming is a cognitive priming outcome that presents a set of interrelated concepts to activate associative nodes in the memory (Hutchison, 2003). To strengthen the generalisability of the research findings by extending the investigation into other priming outcomes, a goal priming outcome is designed and tested in this research.

4.1.2. Overview of the current research

In what follows, we draw on the theory of consumer responsibilisation (Giesler & Veresiu, 2014) and self-standards theory (Stone & Cooper, 2001; Thibodeau & Aronson, 1992) to examining the relationship between self-accountability and consumer environmental responsibilisation. Our initial argumentation is followed by a discussion of the role of environmental responsibilisation in activating anticipated guilt, which in turn affects the decisions toward voluntary carbon offsets. Moreover, we examine and theorise how different levels of consumers' biospheric value, the environmental dimension of perceived corporate social responsibility (enCSR), and perceived credibility of the carbon offset projects can moderate the relationships between self-accountability, environmental responsibilisation, anticipated guilt, and purchase decisions.

We report the results of four experimental studies designed for testing the role of consumer responsibilisation in purchasing voluntary carbon offsets. Across four studies, we demonstrate the positive indirect effect of self-accountability on purchase decisions toward voluntary carbon offsets via sequentially triggering environmental responsibilisation and anticipated guilt. Furthermore, we demonstrate that consumers with higher biospheric value can be more easily primed to be responsibilised by self-accountability prime, when consumers perceive higher enCSR of companies, responsibilisation can more easily make consumers feel anticipated guilt, and when consumers think the carbon offsets project is very credible, anticipated guilt can increase the likelihood to purchase voluntary carbon offsets. We conclude by discussing our contributions to the literature on consumer responsibilisation, voluntary carbon offsets, and self-accountability and outline important implications for airlines designing voluntary carbon offsets projects.

4.2. Theoretical Background and Hypotheses

4.2.1. Self-accountability and the activation of responsibilisation

According to the theory of consumer responsibilisation (Giesler & Veresiu, 2014), consumers can be conceptualised as responsibilised subjects who invest in public goodness through individual market decisions. Giesler and Veresiu (2014, p.841) propose a four-fold neoliberal consumer responsibilisation process (i.e., *P.A.C.T.* process) "that sets into action a reflexive subjectivity deemed suitable to partake in the deployment of horizontal authority and one which willingly bears the consequences of its actions." This *P.A.C.T.* process *personalises* focal social problems as issues of individual desires and choices (e.g., global warming issue); *authorises* scientific knowledge to legitimate the responsible consumer subjectivity (e.g., economic, psychological, and other scientific expert knowledge); *capabilises* a market with sustainable products, services, technologies, and support systems (e.g., sustainable products and carbon footprint tracking system); and, finally, *transforms* consumers into enlightened moral agents who take responsibility of particular social problems and try to solve them through individual decision making (e.g., recycling).

Despite the major conceptual contribution offered by the theory of consumer responsibilisation, there is still much to learn about the ways in which consumers enact (or do not / cannot enact) their responsibility in different purchase and consumption contexts. Current research highlights the attitude-behaviour gap in excising environmental responsibility (Bradshaw & Zwick, 2016). Although consumers' responsibility to protect the environment has been *personalised* by consumers (Culiberg, Cho, Kos Koklic, & Zabkar, 2022), *authorised* by the scientific system (Giesler & Veresiu, 2014), and *capabilised* by market supply (Tian & Robertson, 2019), consumers do not always engage in sustainable purchases (Mahardika et al., 2020). Research shows that while consumers express a positive attitude toward the environmental attributes of products, they do not frequently consider this

factor when they make purchase decisions (Vittel, 2016). Furthermore, when being appointed as responsible market agents, consumers could feel physical, psychological, and philosophical discomforts (Eckhardt & Dobscha, 2019), and even experience tensions (Cherrier & Türe, 2022).

This research contributes to narrowing the attitude-behaviour gap of bearing environmental responsibility from a new perspective, which conceptualises responsibilised consumers as a psychological status rather than a result of a long-term governmental process. The theory of consumer responsibilisation posits that the formation of responsible consumer subjects occurs through a governmental process. In this process, consumers are *transformed* into free, autonomous, rational, and entrepreneurial subjects through *personalisation, authorisation,* and *capabilisation* (Giesler & Veresiu, 2014). Prior research also puts consumers into a context where they are asked to take responsibility for some social issues and observes the results of this governmental process in those contexts (e.g., Cherrier & Türe, 2022; Eckhardt & Dobscha, 2019). However, unlike previous research that conceptualises responsibilisation as the result of a governmental process from a sociological lens, this research adopts a psychological perspective and tries to prime consumers into a responsibilised status from the onset of a decision-making process.

As consumers generally care about the environment and think they should make purchase decisions according to ethical and sustainable criteria (Culiberg et al., 2022), we propose that once self-accountability to this salient self-standard is primed, consumers will feel more responsible and self-accountable to behave in a sustainable manner. Self-accountability is defined as "a person's desire to live up to internal self-standards" (Peloza et al., 2013, p.105). According to self-standards theory (Stone & Cooper, 2001; Thibodeau & Aronson, 1992), people are motivated to shape their behaviour and decisions to be consistent with personally held standards. This theory proposes that people are more inclined to

appraise their behaviour against such personal criteria when personal standards are particularly accessible and salient (Stone & Cooper, 2001). Hence, in the context where self-accountability is primed, consumers will feel more responsible for issues that are held within self-standards and will be motivated to avoid any discrepancy between the ought self (i.e., the self that the person feels a sense of responsibility or duty to be) and the actual self (i.e., the present self that the person actually is). Building on these arguments, we propose:

> **Hypothesis 1**. When primed with self-accountability, consumers' environmental responsibilisation level will be higher.

4.2.2. The effect of anticipated guilt on purchase decisions

Strong environmental responsibilisation is expected to produce guilt for harming the environment. Guilt is a key emotion in the self-regulation process (Eisenberg, 2000), which can be categorised into four distinctive types: (1) financial guilt; (2) health guilt; (3) moral guilt; and (4) social responsibility guilt (Burnett & Lunsford, 1994). Guilt usually comes from self-regulation failures (Zemack-Rugar, Corus, & Brinberg, 2012). Specifically, a feeling of social responsibility guilt occurs when consumers violate perceived obligations (e.g., protecting the environment) as a result of failing self-regulation against social responsibilities (Zimmermann, Abrams, Doosje, & Manstead, 2011). Guilt can not only arise as a reactive result of the violation of social responsibility, but can also appear as an anticipated feeling for an imaginary negative outcome that may take place in the future. According to cognitive psychology research, guilt is determined by advanced cognitive processes that require people to either imagine and simulate a course of behaviour in the future or remember and appraise past deeds (Tracy, Robins, & Tangney, 2007). The former part is usually called anticipated guilt while the latter part is usually called reactive guilt

(Cotte, Coulter, & Moore, 2005). Consumers can experience anticipated guilt simply through mental simulations that imply possible negative consequences in the future (Antonetti & Baines, 2015). For example, consumers could feel anticipated social responsibility guilt when imagining and considering buying products that are not environmentally friendly (Gregory-Smith, Smith, & Winklhofer, 2013). Thus, we suggest an increased level of environmental responsibilisation can spark higher anticipated guilt of not counterbalancing carbon emissions from flights. Formally, we expect:

> **Hypothesis 2**. Self-accountability priming can increase the level of environmental responsibilisation, which in turn increases the anticipated guilt of not counterbalancing carbon emissions from flights.

Consumers take different strategies to deal with negative emotions such as anticipated guilt. One frequently-used strategy is problem-focused coping, which involves purposive actions to tackle the source of the anticipated guilt (Antonetti & Baines, 2015). In the case of anticipated guilt, this includes changing current or coming personal decisions (Tangney, Stuewig, & Mashek, 2007). Empirical studies show that anticipated guilt is powerful in regulating individual consumption decisions and behaviour (Antonetti & Baines, 2015). For instance, anticipated guilt can curb unhealthy food intake (Durkin, Rae, & Stritzke, 2012), inspire consumers to choose healthier alternatives (Cornish, 2012), and encourage more careful financial prudent decisions (Soman & Cheema, 2011). In terms of social standards, research suggests that anticipated guilt can promote environmentally responsible consumption decisions and behaviours (Carrus, Passafaro, & Bonnes, 2008; Peloza et al., 2013). Therefore, we propose that a higher level of anticipated guilt caused by increased environmental responsibilisation can produce a higher preference for purchasing voluntary carbon offsets. Based on these considerations, we hypothesise:

Hypothesis 3. Self-accountability priming positively affects purchase decisions toward voluntary carbon offsets by triggering consumers' environmental responsibilisation, thus positively influencing anticipated guilt.

4.2.3. The moderation effect of biospheric value

Consumers with different levels of self-transcendence values are expected to be differently susceptible to self-accountability priming. Values are conceptions of desirable ways of behaving or preferable end states, for example, behaving in a pro-environmental way or pursuing an end state of a good environment (Schwartz, 1992). Values elicit goals, manoeuvre attention, guide individuals' behaviour, and function as benchmarks against which present experiences can be evaluated (Feather, 1995; Schwartz, 1999). Furthermore, values are central to self-definition and contribute to one's sense of who one is (the actual self) and who one should be (the ought self) (Verplanken & Holland, 2002). Values can be culturally shared, such that different individuals may endorse the same values, especially when these individuals share the same cultural background (Steg, Perlaviciute, Van der Werff, & Lurvink, 2014). However, different people may prioritise values differently. This implies that when facing conflicting values, people will consider the most important value to act on, resulting in different choices for different people (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014).

In the environmental domain, Schwartz's (1992; 1994) value theory reveals two kinds of self-transcendence values (i.e., altruistic and biospheric) placed on different targets (i.e., other people and the biosphere). These two values direct attention toward value-related information, and in turn influence beliefs, attitudes, and decisions related to environmental behaviour (Stern & Dietz, 1994). Altruistic value refers to concern with the welfare of other

human beings (Steg et al., 2014). Biospheric value is defined as "a concern with the quality of nature and the environment for its own sake, without a clear link to the welfare of other human beings" (Steg et al., 2014, p.4). As such, it differs from altruistic values. People with strong biospheric values are more likely to be aware of and feel responsible for, the negative environmental impact of their choices (Bösehans, Bolderdijk, & Wan, 2020). Research indicates that individuals with a high level of biospheric value have stronger pro-environmental beliefs, and attitudes, and exhibit more environmental-friendly behaviours (e.g., De Groot & Steg, 2008, 2010; Honkanen & Verplanken, 2004). Since biospheric value contributes to defining the ought self and guide people to feel responsible for environmental consequences (De Groot & Steg, 2010), we propose that individuals with stronger biospheric value can be more easily primed to be environmentally responsibilised by self-accountability prime. Therefore, we argue:

> **Hypothesis 4**. Compared with consumers with weak biospheric value, self-accountability priming can more easily trigger consumers' environmental responsibilisation for those with strong biospheric value, which in turn positively influences anticipated guilt and purchase decisions toward voluntary carbon offsets.

4.2.4. The moderation effect of perceived environmental CSR

When facing different companies with various levels of CSR, responsibilised consumers are supposed to have different emotional reactions. CSR is crucial in marketing research, particularly regarding its influence on consumer behaviour (Green & Peloza, 2011; Peloza & Shang, 2011). CSR is defined as "a firm's commitment to maximising long-term economic, societal and environmental well-being through business practices, policies and

resources" (Du, Bhattacharya, & Sen, 2011, p.1). The level of CSR perceived by consumers affects consumers' reactions toward companies (Becker-Olsen, Cudmore, & Hill, 2006). For instance, research indicates that perceived CSR has a positive effect on cognitive and affective brand images (He & Li, 2011), cognitive and affective satisfaction (Bianchi, Bruno, & Sarabia-Sanchez, 2019), and purchase intent (Aksak, Ferguson, & Duman, 2016; Bianchi et al., 2019). While there are different conceptualisations of CSR, the three-dimensional model (i.e., economic, social, and environmental CSR) is a widely accepted representation of the construct (Alvarado-Herrera, Bigne, Aldas-Manzano, & Curras-Perez, 2017). Research also affirms that different dimensions of perceived CSR exert different influences (Wu & Wang, 2014). For example, a study suggests that, in the hotel industry, enCSR is highly correlated with conative loyalty, while social CSR is highly correlated with cognitive and affective loyalty (Ahn, Wong, & Kwon, 2020).

The degree of perceived CSR is expected to affect the extent to which consumers consider companies to take fair responsibilities. This evaluation stems from the assumption that, in the neoliberal logic, all responsibility must be fairly shared within a society between different actors (Lemke, 2015). Consumers tend to approve, echo, and imitate socially responsible behaviours when they recognise other actors are taking fair actions that are beneficial to society (Solomon et al., 2017). In the environmental domain, when companies bear fair shares of environmental responsibility, consumers are more willing to perform sustainable purchases (Kim, Yin, & Lee, 2020; Wang, Yuen, Wong, & Teo, 2018). That is to say, consumers' perception of companies' environmental responsibility can stimulate consumers to undertake pro-environmental responsibility (Iglesias, Markovic, Bagherzadeh, & Singh, 2020), which is expected to spark consumers' anticipated guilt if they do not take corresponding pro-environmental actions (c.f., Culiberg et al., 2022; McGraw, 1987). Thus, we propose that when consumers perceive high enCSR, responsibilisation can more easily

lead to anticipated guilt. Formally, we expect:

> **Hypothesis 5**. Self-accountability priming triggers consumers' environmental responsibilisation, and compared with low perceived enCSR, environmental responsibilisation can more easily produce anticipated guilt when perceived enCSR is high, which leads to more favourable purchase decisions toward voluntary carbon offsets.

4.2.5. The moderation effect of perceived credibility

Consumers who experience different levels of anticipated guilt may react differently to voluntary carbon offset projects that signal different levels of credibility. Consumers perceive carbon offset projects with different credibility based on the information provided by airlines (Zhang et al., 2019a). For instance, by disclosing detailed information timely about the operation of carbon offset projects, an airline can increase the perceived credibility of the project (Guix et al., 2022). Whether a carbon offset project is perceived as credible or not is important in terms of environmental purchase decisions (Zhang et al., 2019a, 2019b). Improving credibility levels of voluntary carbon offset communications may generate more positive attitudes and stimulate purchase intent among air passengers (Babakhani et al., 2017; Becken & Mackey, 2017). On the contrary, a low level of perceived credibility of voluntary carbon offset becomes a significant barrier to purchase decisions (Carrete et al., 2012). That is, a high level of perceived credibility may have a limited effect on promoting sustainable purchases, but a low level of perceived credibility could be a considerable barrier to sustainable purchases.

Although only a small percentage of the variance in purchase decisions for voluntary carbon offsets can be explained by perceived credibility (Zhang et al., 2019a), the

effectiveness of perceived credibility probably increases significantly when consumers feel anticipated guilty. As discussed before, one significant strategy people use to deal with negative emotions such as anticipated guilt is problem-focused coping that targets the source of the emotion rather than the emotion per se (Antonetti & Baines, 2015). In the case of anticipated guilt, this strategy includes calibrating forthcoming personal decisions in accordance with the goal of decreasing anticipated guilt (Tangney et al., 2007). When consumers feel anticipated guilty about not offsetting carbon emissions, carbon offset projects with strong credibility are expected to increase consumers' confidence. Credibility is likely to increase consumers' perception of effectiveness when counterbalancing carbon emissions through the purchase of voluntary carbon offsets. Based on this, we posit:

> **Hypothesis 6**. Self-accountability priming triggers consumers' environmental responsibilisation that positively influences anticipated guilt, and compared with low perceived credibility, anticipated guilt leads to more favourable purchase decisions toward voluntary carbon offsets when perceived credibility is high.

4.2.6. Outlines of studies

The current research consists of four studies to test six hypotheses (see Table 4.1 and Figure 4.1). In study one, we test the role of self-accountability in activating environmental responsibilisation, which leads to anticipated guilt of not offsetting carbon emissions and carbon offset purchases. In study two, we add biospheric value as a moderator to study one set-up, to test whether biospheric value could influence the relationship between self-accountability priming and environmental responsibilisation. In study three, we add perceived enCSR as a moderator to test whether perceived enCSR could affect the extent to which environmental responsibilisation can trigger anticipated guilt. In study four, perceived

credibility is added to test whether the level of perceived credibility influences the extent to which anticipated guilt could lead to carbon offset purchase.

Table 4.1 Outline of studies

Study	Moderator	Mediator	Hypothesis	Research Aim
One	N/A	Environmental responsibilisation; Anticipated guilt	H1; H2; H3	To test whether self-accountability priming positively affects carbon offset purchase by triggering environmental responsibilisation and anticipated guilt
Two	Biospheric value	Environmental responsibilisation; Anticipated guilt	H4	To test whether the level of biospheric value influence to what extent self-accountability priming sparks environmental responsibilisation
Three	Perceived enCSR	Environmental responsibilisation; Anticipated guilt	H5	To test whether the level of perceived enCSR influences to what extent environmental responsibilisation triggers anticipated guilt
Four	Perceived credibility	Environmental responsibilisation; Anticipated guilt	H6	To test whether the level of perceived credibility influences to what extent anticipated guilt leads to carbon offset purchase

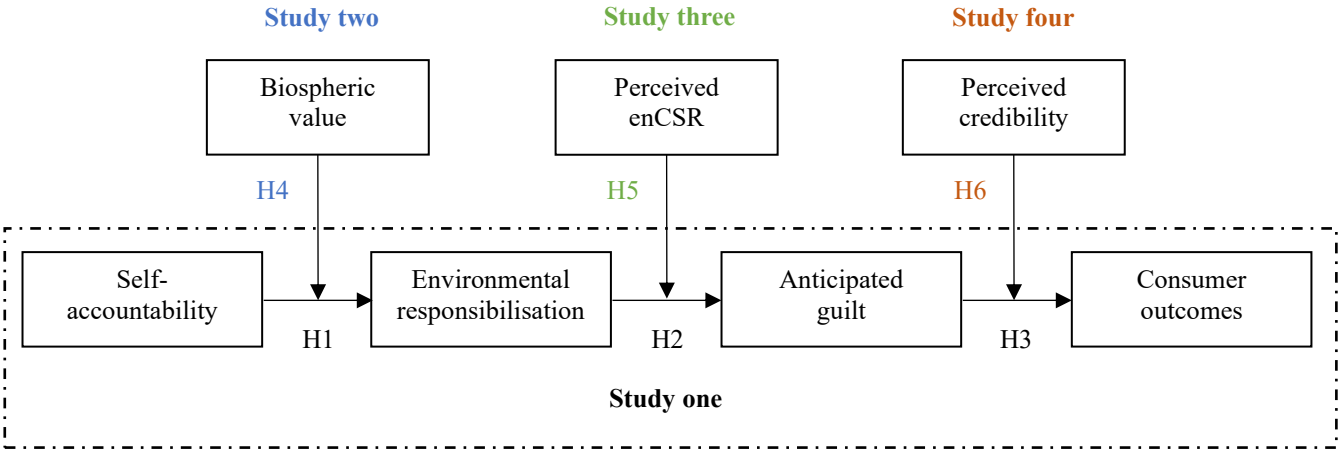


Figure 4.1 Conceptual framework of the current research

4.3. Study One

Study one tests a mediation model with two sequential mediators (see Figure 4.2). As H1, H2, and H3 state, when participants are primed with self-accountability, they become more environmentally responsibilised, which produces higher anticipated guilt of not

offsetting carbon emissions, thus leading to the purchase of voluntary carbon offsets. In study one, a mature semantic priming of self-accountability is employed, in which a series of concepts related to self-standards is used to activate the accessibility of participants' self-standards (e.g., Peloza et al., 2013; Tran & Paparoidamis, 2021).

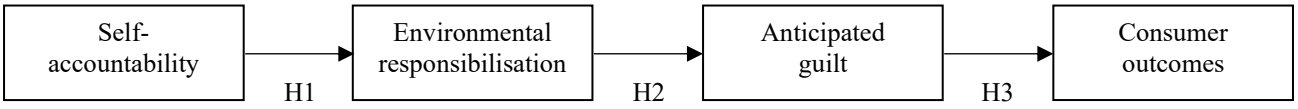


Figure 4.2 The research framework of study one

4.3.1. Method

One hundred and forty-one participants (44 males, M_{age} = 40.7) who live in the UK were recruited on Prolific in exchange for a participation fee. When asked "How many times have you flown in the past 12 months? (Count a return trip as two)?", around 65% of participants indicated they took at least one flight in the past 12 months. In a two-condition between-subjects design, participants were randomly assigned to either the self-accountability condition or the control condition. The study's introduction informed participants that they would be taking part in a flying experience survey and reassured them that all their responses were completely anonymous and would be held in strict confidentiality.

We manipulated self-accountability by following guidelines from previous research (Peloza et al., 2013). All participants were given a list of 36 words, and were instructed to classify them into three categories and to name each category, where no alternative names or labels were provided. All participants received twelve words related to cooking (e.g., "pans", "bake", and "cook"), and 12 words related to children (e.g., "play", "childhood", and "diapers"). Participants in the self-accountability condition receive another 12 words related to self-accountability (e.g., "responsible", "standards", and "the ought self"), while in the

control condition, participants received another 12 words related to furniture (e.g., “chairs”, “rug”, and “ottoman”). The full list of the words can be found in Appendix A. Following this manipulation, all participants completed a filler task A by answering questions about their flying experience (see Appendix B).

After completing the priming task and filler questions, all participants were asked to complete a five-item environmental responsibilisation scale (α = .947; adapted from Scholl, Sassenberg, Scheepers, Ellemers, & de Wit, 2017; see Appendix C). Then the filler task B about the flying experience was presented to participants (see Appendix B), followed by information on the carbon emissions from taking flights, and the introduction of a carbon offset project (see Appendix D). Subsequently, participants were instructed to complete a two-item anticipated guilt measure (α = .966; adapted from Onwezen, Bartels, & Antonides, 2014; see Appendix C).

As for the dependent variables, we measured consumers’ purchase intent, willingness to pay (WTP), and compensation percentage. A three-item measure was presented for measuring purchase intent toward voluntary carbon offset (α = .946; adapted from Peloza et al., 2013; see Appendix C). Then, all participants were asked to answer two questions about WTP (What percentage of your flight ticket fee would you like to add for buying carbon offset for your next flight?”; range from 0 to 100) and compensation percentage: (“Now the airline company introduces a new way of buying carbon offset, by which customers can not only choose full compensation or no compensation but also can choose the percentage of the CO_2 emissions they want to compensate partially. What percentage of the CO_2 emissions would you like to compensate by buying a carbon offset for your next flight?”, range from 0 to 100). The price and the length of the flight have not been assigned or mentioned in the experiment. At last, participants answered demographic questions and were thanked.

4.3.2. Result

Table 4.2 Study one results of mediation for purchase intentions

		Environmental responsibilisation (M_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.043$	Constant	4.076	0.161	25.351	< .001
F (1, 139) = 6.169	Self-accountability priming (X)	0.567	0.228	2.484	0.014
$p = .014$					

		Anticipated guilt (M_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.364$	Constant	0.618	0.404	1.529	0.129
F (2, 138) = 39.546	Self-accountability priming (X)	-0.289	0.247	-1.171	0.244
$p < .001$	Environ responsibilisation (M_1)	0.797	0.090	8.868	< .001

		Purchase intent (Y_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.418$	Constant	1.218	0.331	3.680	< .001
F (3, 137) = 32.847	Self-accountability priming (X)	0.323	0.202	1.602	0.112
$p < .001$	Environ responsibilisation (M_1)	0.231	0.092	2.529	0.013
	Anticipated guilt (M_2)	0.404	0.069	5.841	< .001
		Indirect effect of X on Y_1 via M_1 and M_2			
		β	SE	LLCI	ULCI
		0.183	0.084	0.033	0.362

		Willingness to pay (Y_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.082$	Constant	1.787	3.493	0.511	0.610
F (3, 137) = 4.100	Self-accountability priming (X)	1.901	2.129	0.893	0.374
$p = .008$	Environ responsibilisation (M_1)	0.449	0.966	0.465	0.643
	Anticipated guilt (M_2)	1.702	0.730	2.332	0.021
		Indirect effect of X on Y_2 via M_1 and M_2			
		β	SE	LLCI	ULCI
		0.769	0.466	0.016	1.839

		Compensation percentage (Y_3)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.204$	Constant	-2.015	6.589	-0.306	0.760
F (3, 137) = 11.692	Self-accountability priming (X)	9.679	4.016	2.410	0.017
$p < .001$	Environ responsibilisation (M_1)	-0.282	1.821	-0.155	0.877
	Anticipated guilt (M_2)	5.929	1.377	4.307	< .001
		Indirect effect of X on Y_3 via M_1 and M_2			
		β	SE	LLCI	ULCI
		2.679	1.290	0.526	5.512

Note: β = unstandardised regression coefficient, SE = standard error, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval.

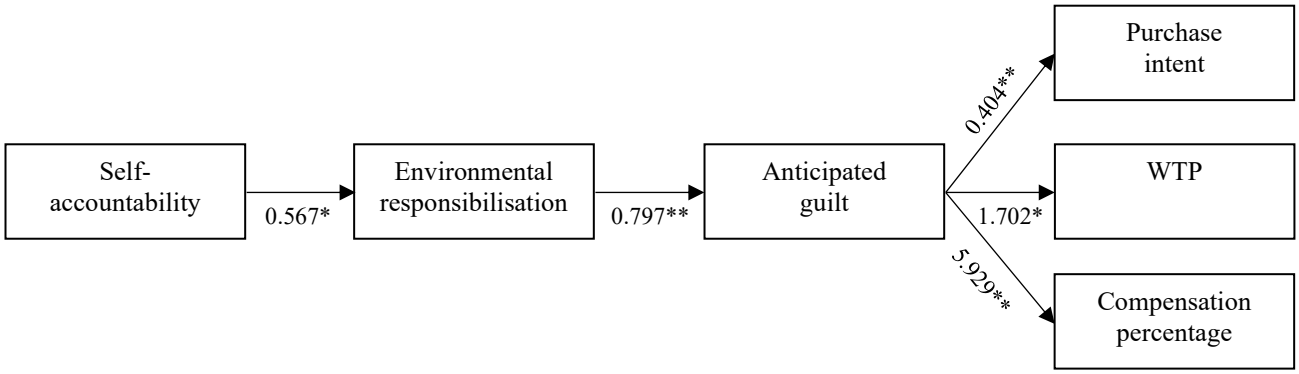


Figure 4.3 The research framework of study one with statistical results

Note: * means $p < .05$, ** means $p < .001$

As H1, H2, and H3 state, self-accountability priming could produce higher environmental responsibilisation, which in turn boosts anticipated guilt and then encourages voluntary carbon offsets purchase. We examine this serial mediation model with model 6 of PROCESS macro for SPSS version 4.0 (95% bootstrap confidence interval, based on 5,000 bootstrap samples) (see Table 4.2 and Figure 4.3).

Study one's results show that participants who are primed with self-accountability experience a higher level of environmental responsibilisation ($\beta = 0.567$, $t = 2.484$, $p = .014$), which supports H1. Participants who have higher levels of environmental responsibilisation can feel more anticipated guilt of not counterbalancing carbon emissions ($\beta = 0.797$, $t = 8.868$, $p < .001$), which supports H2. Regarding H3, the indirect effect of self-accountability priming on consumer outcomes via environmental responsibilisation and anticipated guilt sequentially is also statistically significant for purchase intent ($\beta = 0.183$, SE = 0.084, 95% CI = 0.033 to 0.362), WTP ($\beta = 0.769$, SE = 0.466, 95% CI = 0.016 to 1.839), and compensation percentage ($\beta = 2.679$, SE = 1.290, 95% CI = 0.526 to 5.512).

4.3.3. Discussion

Study one shows that participants who are primed by self-accountability report greater environmental responsibilisation, which stimulates stronger anticipated guilt of not counterbalancing carbon emissions. This sequential process leads to consumers expressing more favourable preferences for voluntary carbon offset purchases. These results support H1, H2, and H3. In study two, we explore further this decision process by introducing biospheric value as a boundary condition of the positive effect of self-accountability on environmental responsibilisation.

4.4. Study Two

Study two tests a moderated mediation model with two sequential mediators (see Figure 4.4). This study extends the finding of study one by considering the varying effectiveness of self-accountability priming in triggering environmental responsibilisation conditional on different types of consumers. As H4 states, for consumers with higher biospheric value, self-accountability priming could more easily increase environmental responsibilisation, which produces higher anticipated guilt of not offsetting carbon emissions, which increases the likelihood to purchase voluntary carbon offset.

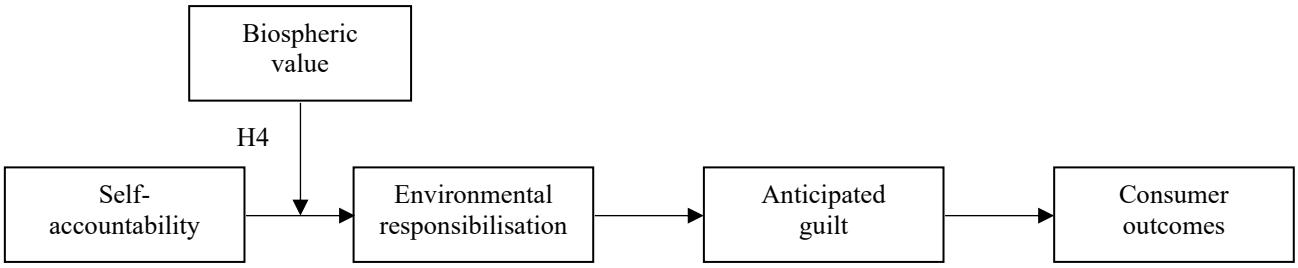


Figure 4.4 The research framework of study two

4.4.1. Method

One hundred and thirty-six participants (51 males, M_{age} = 37.2) who live in the UK were recruited on Prolific in exchange for a participation fee. When asked "How many times have you flown in the past 12 months? (Count a return trip as two)?", around 91% of participants indicated they took at least one flight in the past 12 months. In a two-condition between-subjects design, participants were randomly assigned to either the self-accountability condition or the control condition. The study's introduction informed participants that they would be taking part in a flying experience survey and reassured them that all their responses were completely anonymous and would be held in strict confidentiality.

The experiment procedure and manipulations followed the same protocol implemented in study one, except for one difference. Before the self-accountability priming, all participants were first asked to complete a value measure with four values included (i.e., hedonic, egoistic, altruistic, and biospheric; Steg et al., 2014). To prevent the research purpose from being obvious, participants were asked to complete the full measure, and the measures for all four values show good reliability (biospheric, α = .946; altruistic, α = .851; hedonic, α = .904; egoistic, α = .898). Following this initial set of questions, participants undertook filler task C (see Appendix B) and proceed to complete the remaining sections of the study. Measures adopted in study two also displayed good reliability (environmental responsibilisation, α = .903; anticipated guilt, α = .907; purchase intent, α = .931).

4.4.2. Result

As H4 states, self-accountability priming could produce higher environmental responsibilisation, especially for those participants with higher biospheric value, which in

turn boosts anticipated guilt and then encourages voluntary carbon offsets purchase. We examine this moderated mediation model with two mediators by using model 83 of PROCESS macro for SPSS version 4.0 (95% bootstrap confidence interval based on 5,000 bootstrap samples) (see Table 4.3 and Figure 4.5).

Study two's results show that for participants who have low biospheric value (-1 SD), self-accountability has no effect on them (β = 0.184, SE = 0.203, 95% CI = -0.218 to 0.585), while participants with high biospheric value (+1 SD) can be more easily primed to be environmentally responsibilised (β = 1.118, SE = 0.203, 95% CI = 0.716 to 1.519). As shown in Table 3, participants who have higher levels of environmental responsibilisation can feel more anticipated guilt of not counterbalancing carbon emissions (β = 0.375, t = 3.327, p = .002), which leads to more purchase intent (β = 0.679, t = 8.745, p < .001), WTP (β = 2.211, t = 2.935, p = .004), and higher compensation percentage (β = 6.214, t = 3.809, p < .001) toward voluntary carbon offsets.

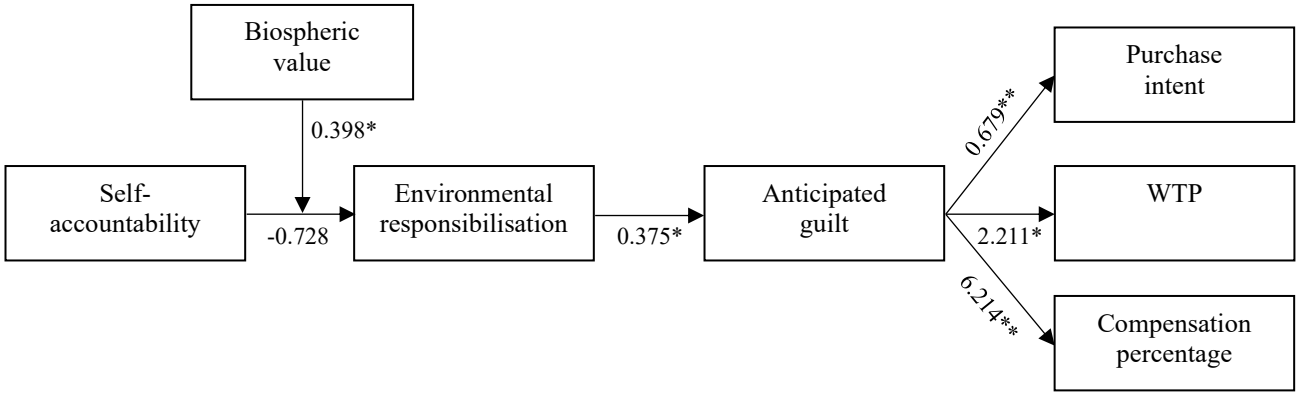


Figure 4.5 The research framework of study two with statistical results

Note: * means p < .05, ** means p < .001

Table 4.3 Study two results of moderated mediation for purchase intentions

		Environmental responsibilisation (M_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.303$	Constant	3.843	0.324	11.849	< .001
F (3, 132) = 19.111	Self-accountability priming (X)	-0.728	0.449	-1.623	0.107
$p < .001$	Biospheric value (W)	0.103	0.089	1.161	0.248
	$X \times W$	0.398	0.123	3.243	0.002
		Conditional effects of X on M_1			
	Levels of moderator	β	SE	LLCI	ULCI
	- 1 SD Biospheric value	0.184	0.203	-0.218	0.585
	+1 SD Biospheric value	1.118	0.203	0.716	1.519

		Anticipated guilt (M_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.103$	Constant	1.851	0.511	3.628	< .001
F (2, 133) = 7.619	Self-accountability priming (X)	0.226	0.229	0.987	0.325
$p < .001$	Environ responsibilisation (M_1)	0.375	0.116	3.237	0.002

		Purchase intent (Y_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.403$	Constant	1.564	0.479	3.267	0.001
F (3, 132) = 29.638	Self-accountability priming (X)	-0.363	0.206	-1.765	0.079
$p < .001$	Environ responsibilisation (M_1)	0.111	0.108	1.031	0.305
	Anticipated guilt (M_2)	0.679	0.078	8.745	< .001
		Conditional indirect effect of X on Y_1 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	- 1 SD Biospheric value	0.047	0.064	-0.064	0.191
	+1 SD Biospheric value	0.285	0.111	0.073	0.511
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Biospheric value	0.101	0.049	0.014	0.208

		Willingness to pay (Y_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.104$	Constant	1.857	4.645	0.399	0.689
F (3, 132) = 5.082	Self-accountability priming (X)	2.293	1.993	1.151	0.252
$p = .002$	Environ responsibilisation (M_1)	0.752	1.046	0.719	0.474
	Anticipated guilt (M_2)	2.211	0.753	2.935	0.004
		Conditional indirect effect of X on Y_2 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	- 1 SD Biospheric value	0.152	0.229	-0.179	0.715
	+1 SD Biospheric value	0.927	0.451	0.197	1.988
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Biospheric value	0.331	0.183	0.032	0.737

Continued

		Compensation percentage (Y_3)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.116$	Constant	1.361	10.063	0.138	0.891
F (3, 132) = 5.775	Self-accountability priming (X)	-3.256	4.317	-0.754	0.452
$p = .001$	Environ responsibilisation (M_1)	1.318	2.265	0.582	0.562
	Anticipated guilt (M_2)	6.214	1.632	3.809	< .001
		Conditional indirect effect of X on Y_3 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	- 1 SD Biospheric value	0.428	0.622	-0.553	1.977
	+1 SD Biospheric value	2.607	1.206	0.604	5.291
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Biospheric value	0.928	0.505	0.117	2.077

Note: β = unstandardised regression coefficient, SE = standard error, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval.

In addition, the conditional process analysis for the index of moderated mediation does not include zero, thus providing evidence for the hypothesised moderated mediation: purchase intent (B = 0.101, 95% CI = 0.014 to 0.208), WTP (B = 0.331, 95% CI = 0.032 to 0.737), and compensation percentage (B = 0.928, 95% CI = 0.117 to 2.077). Thus, we can conclude (with 95% confidence) that there is a conditional indirect effect. When the biospheric value is high, self-accountability positively affects purchase intentions via environmental responsibilisation and anticipated guilt.

At the same time, the moderating effect of the other three values is tested as well (model 83 of PROCESS macro for SPSS version 4.0, 95% bootstrap confidence interval based on 5,000 bootstrap samples). For altruistic value, the index of moderated mediation does include zero, thus not providing evidence for the moderated mediation: purchase intent (B = 0.003, 95% CI = -0.134 to 0.112), WTP (B = 0.009, 95% CI = -0.511 to 0.348), and compensation percentage (B = 0.024, 95% CI = -1.327 to 1.004). For hedonic value, the index of moderated mediation includes zero, thus not providing evidence for the moderated mediation: purchase intent (B = 0.003, 95% CI = -0.063 to 0.066), WTP (B = 0.011, 95% CI = -0.196 to 0.246), and compensation percentage (B = 0.028, 95% CI = -0.532 to 0.679), and

regarding the egoistic value, the index of moderated mediation also includes zero, hence not providing evidence for the moderated mediation either: purchase intent (B = -0.031, 95% CI = -0.152 to 0.055), WTP (B = -0.102, 95% CI = -0.501 to 0.191), and compensation percentage (B = -0.285, 95% CI = -1.379 to 0.579).

4.4.3. Discussion

Study two provides further evidence of the positive indirect effect of self-accountability on purchase intentions toward voluntary carbon offsets via environmental responsibilisation and anticipated guilt, which is consistent with H3. However, taking this process further, study two indicates that this indirect effect only exists for consumers with relatively high biospheric value, which supports H4. Specifically, only for people who hold "protecting the environment" within self-standards, self-accountability priming can make this "ought self" salient, and then stimulates them to be environmentally responsibilised. In study three, we explore another boundary condition of this decision process. In particular, we examine whether the effect of environmental responsibilisation on anticipated guilt is conditional upon perceived enCSR.

4.5. Study Three

Study three tests another moderated mediation model with two sequential mediators (see Figure 4.6). Study three builds on previous studies in two ways. First, it extends the findings by considering the varying effectiveness of environmental responsibilisation in producing anticipated guilt when facing different firms with various perceived enCSR. As H5 states, when responsibilised consumers perceive relatively high enCSR, they are more likely to feel anticipated guilty association with the purchasing behaviour that has a

detrimental impact on the environment. Second, studies one and two employ a semantic priming to manipulate self-accountability, in which a set of concepts related to self-standards are presented to activate interrelated nodes in memory. In study three, we enhance the generalisability of the findings by extending the investigation into another priming outcome: goal priming. Goal priming aims to activate the end-goal state and then encourage individuals to pursue a specific goal. Consistent with the definition of self-accountability, study three applies a goal-priming task asking participants to answer a true/false quiz, in which a self-accountability goal (i.e., a goal of staying tight with self-standards) is primed.

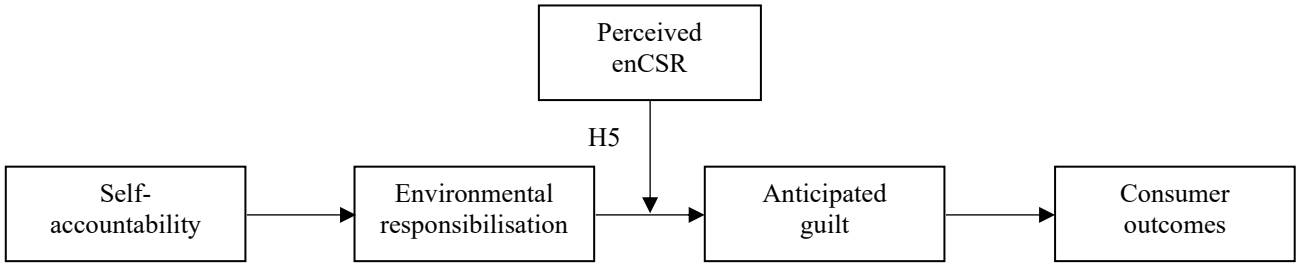


Figure 4.6 The research framework of study three

4.5.1. Pre-test for goal priming

A pre-test was conducted to examine self-accountability priming in the form of goal priming (adapted from the goal priming design by Evans et al., 2013). Seventy participants (27 males, M_{age} = 38.8) recruited on Prolific were randomly allocated into either the self-accountability condition or the control condition. The manipulation contained several statements for each of the four topics: hobbies, work, self-accountability, and enjoying life. All participants were asked to evaluate statements for the topics of hobbies and work from 1-definitely false to 5-definitely true. An example statement of hobbies was “The most popular hobby in the UK for men is playing football.” At the end of each of these two topics, participants were asked “how often do you take part in a hobby?” and “how personally important is your work/study to you?” on a scale from 0 to 100 respectively. Participants in

the self-accountability condition then evaluated the statements related to self-accountability, and ended with a question "how important is staying tight with your self-standards to you?" on a scale from 0 to 100 designed to priming a self-accountability goal. By contrast, participants in the control condition completed the task for the topic of enjoying life. The full list of statements in all four topics can be found in Appendix A. After completing filler tasks A and B (see Appendix B), participants received a three-item measure of self-accountability (Peloza et al., 2013; Tran & Paparoidamis, 2021): (1) "How accountable are you to behave in an ethical manner?" (2) "How strongly are you motivated to live up to your own self-standards?" and (3) "How accountable do you feel to your own self-standard?" (on seven-point scales; α = .81; Peloza et al., 2013). The results revealed that participants in the self-accountability priming condition were significantly more self-accountable (M = 5.75) than those who received the neutral prime (M = 5.06, $t_{(68)}$ = -2.97, p = .004). Based on these results, we considered this self-accountability priming manipulation successful.

4.5.2. Pre-test for perceived enCSR

A pre-test was conducted to examine the material for perceived enCSR. Eighty participants (26 males, M_{age} = 40.6) recruited on Prolific were randomly allocated into either the high perceived enCSR condition or the control condition. Participants in different conditions received different versions of a poster advertisement from a hypothetical airline "UK Flyer". These two posters can be found in Appendix D. Then, participants answered questions measuring enCSR, economical CSR (Alvarado-Herrera et al., 2017), and utilitarian and hedonic attitudes (Voss, Spangenberg, & Grohmann, 2003) toward the advertisement. All measures exhibited a good level of reliability (enCSR, α = .888; economical CSR, α = .768; utilitarian attitude, α = .861; hedonic attitude, α = .963). The results revealed that participants in the high-enCSR condition perceived "UK Flyer" with higher enCSR (M =

5.03) than those in the control condition (M = 4.43, $t_{(78)}$ = -2.54, p = .013). Consisted with our intended design, the two conditions did not differ in terms of economical CSR ($t_{(78)}$ = -.17, p = .867), utilitarian attitude ($t_{(78)}$ = -1.51, p = .134), and hedonic attitude ($t_{(78)}$ = -1.59, p = .116). Therefore, we considered this enCSR manipulation successful.

4.5.3. Method

Two hundred and forty-two participants (96 males, M_{age} = 37.2) who live in the UK were recruited on Prolific in exchange for a participation fee. When asked "How many times have you flown in the past 12 months? (Count a return trip as two)?", around 76% of participants indicated they took at least one flight in the past 12 months. In a 2×2 between-subjects design, participants were randomly assigned to one of four conditions: self-accountability vs. control, crossed with perceived enCSR (high vs. control). The study's introduction informed participants that they would be taking part in a flying experience survey and reassured them that all their responses were completely anonymous and would be held in strict confidentiality.

The experiment procedure and manipulations followed the protocol implemented in study one, except for two differences. First, the semantic priming was replaced by the goal priming examined in the above pre-test for priming self-accountability (self-accountability vs. control). Second, in study three, after receiving the environmental responsibilisation measure and filler task A, all participants randomly received either a high enCSR poster or a control enCSR poster (perceived enCSR high vs. control), then the rest of the procedure started. In study three, all measures employed displayed good reliability (environmental responsibilisation. α = .925; anticipated guilt, α = .862; and purchase intent, α = .963).

4.5.4. Result

As H5 states, self-accountability priming could produce higher environmental responsibilisation, and compared with low perceived enCSR, environmental responsibilisation can more easily produce anticipated guilt when perceived enCSR is high. This process should lead to more favourable purchase intentions toward voluntary carbon offsets. We examine this moderated mediation model with two mediators by using model 91 of PROCESS macro for SPSS version 4.0 (95% bootstrap confidence interval based on 5,000 bootstrap samples) (see Table 4.4 and Figure 4.7).

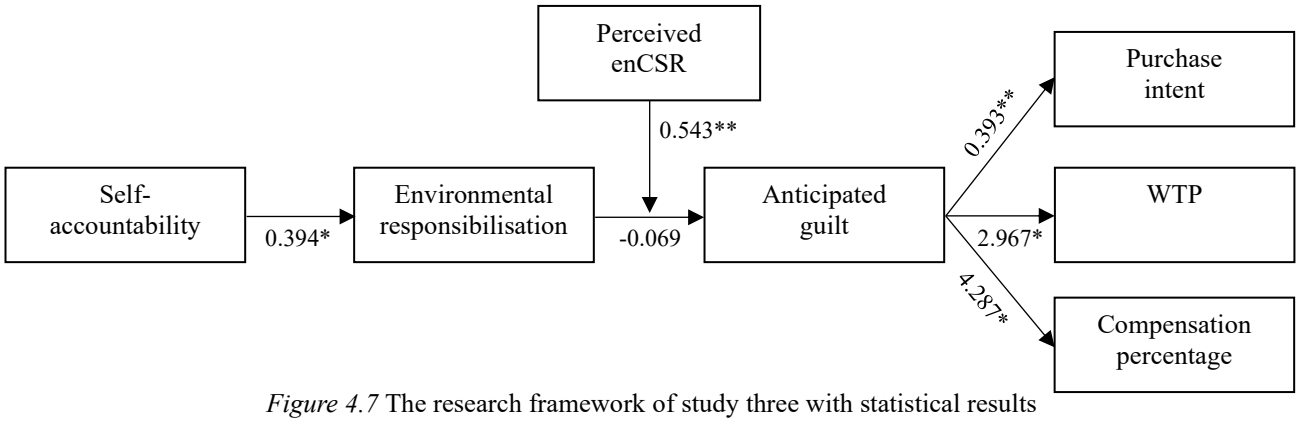


Figure 4.7 The research framework of study three with statistical results

Note: * means $p < .05$, ** means $p < .001$

Study three's results show that when perceived enCSR is neutral, environmental responsibilisation can hardly activate anticipated guilt (β = -0.067, SE = 0.101, 95% CI = -0.265 to 0.131), while with high enCSR, environmental responsibilisation can more easily produce anticipated guilt (β = 0.476, SE = 0.098, 95% CI = 0.282 to 0.669). Furthermore, Table 4's results indicate that participants who experience more anticipated guilt for not counterbalancing carbon emissions display more favourable purchase intentions (β = 0.393, t = 5.131, $p < .001$), WTP (β = 2.967, t = 2.717, $p < .001$), and compensation percentage (β = 4.287, t = 3.116, p = .002) toward voluntary carbon offsets.

In addition, the conditional process analysis for the index of moderated mediation does not include zero, thus providing evidence for the moderated mediation processes leading to

purchase intent (B = 0.084, 95% CI = 0.017 to 0.186), WTP (B = 0.634, 95% CI = 0.105 to 1.499), and compensation percentage (B = 0.916, 95% CI = 0.142 to 2.198). Thus, it could be concluded (with 95% confidence) that there is a conditional indirect effect. Only when the perceived enCSR is high, environmental responsibilisation positively affects anticipated guilt, then have more favourable purchase intentions toward voluntary carbon offsets.

Table 4.4 Study three results of moderated mediation for purchase intentions

		Environmental responsibilisation (M_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.031$	Constant	4.309	0.099	43.181	< .001
F (1, 240) = 7.707	Self-accountability priming (X)	0.394	1.142	2.776	0.006
$p = .006$					

		Anticipated guilt (M_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.106$	Constant	4.081	0.468	8.718	< .001
F (4, 237) = 6.991	Self-accountability priming (X)	0.128	0.158	0.809	0.419
$p < .001$	Environ responsibilisation (M_1)	-0.069	0.101	-0.668	0.505
	Perceived enCSR (W)	-2.161	0.647	-3.342	0.001
	$M_1 \times W$	0.543	0.139	3.896	< .001
		Conditional effects of M_1 on M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Control perceived enCSR	-0.067	0.101	-0.265	0.131
	High perceived enCSR	0.476	0.098	0.282	0.669

		Purchase intent (Y_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.248$	Constant	0.291	0.458	0.635	0.526
F (3, 238) = 26.169	Self-accountability priming (X)	-0.344	0.193	-1.786	0.076
$p < .001$	Environ responsibilisation (M_1)	0.544	0.088	6.194	< .001
	Anticipated guilt (M_2)	0.393	0.077	5.131	< .001
		Conditional indirect effect of X on Y_1 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Control perceived enCSR	-0.011	0.015	-0.045	0.013
	High perceived enCSR	0.074	0.036	0.016	0.161
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Perceived enCSR	0.084	0.044	0.017	0.186

Continued

		Willingness to pay (Y_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.111$	Constant	-9.119	4.772	-1.911	0.057
F (3, 238) = 9.824	Self-accountability priming (X)	-2.491	2.011	-1.239	0.217
$p < .001$	Environ responsibilisation (M_1)	2.942	0.915	3.215	0.002
	Anticipated guilt (M_2)	2.967	0.798	2.717	< .001
		Conditional indirect effect of X on Y_2 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Control perceived enCSR	-0.078	0.114	-0.355	0.097
	High perceived enCSR	0.556	0.306	0.097	1.274
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Perceived enCSR	0.634	0.364	0.105	1.499

		Compensation percentage (Y_3)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.125$	Constant	-14.877	8.223	-1.809	0.072
F (3, 238) = 11.307	Self-accountability priming (X)	-2.392	3.464	-0.691	0.491
$p < .001$	Environ responsibilisation (M_1)	6.754	1.577	4.283	< .001
	Anticipated guilt (M_2)	4.287	1.376	3.116	0.002
		Conditional indirect effect of X on Y_3 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Control perceived enCSR	-0.113	0.167	-0.528	0.128
	High perceived enCSR	0.803	0.441	0.138	1.849
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Perceived enCSR	0.916	0.531	0.142	2.198

Note: β = unstandardised regression coefficient, SE = standard error, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval.

4.5.5. Discussion

Study three also confirms the positive indirect effect of self-accountability on purchase intentions toward voluntary carbon offsets via environmental responsibilisation and anticipated guilt, which is consistent with H3. Furthermore, this study identifies a new boundary condition of this positive indirect effect. The results of study three indicate that this indirect effect only exists when perceive enCSR is relatively high for the airline, which supports H5. Specifically, only for those airlines perceived to be environmentally

responsible, consumers would be more inclined to join their pro-environmental actions. In study four, we explore whether the effect of anticipated guilt on purchase intentions is conditional upon the perceived credibility of carbon offset projects.

4.6. Study Four

Study four tests another moderated mediation model with two sequential mediators (see Figure 4.8). Study four explores perceived credibility as a boundary condition of the decision process shown in Figure 4.2. We expect this moderation to take place in the last stage of the process, between anticipated guilt and purchase intentions. As H6 states, consumers who feel anticipated guilt, tend to purchase voluntary carbon offsets. However, consumers are expected to respond more to carbon offset projects that they think are credible enough. This study is going to test whether the effect of anticipated guilt on purchase intentions is conditional upon perceived credibility.

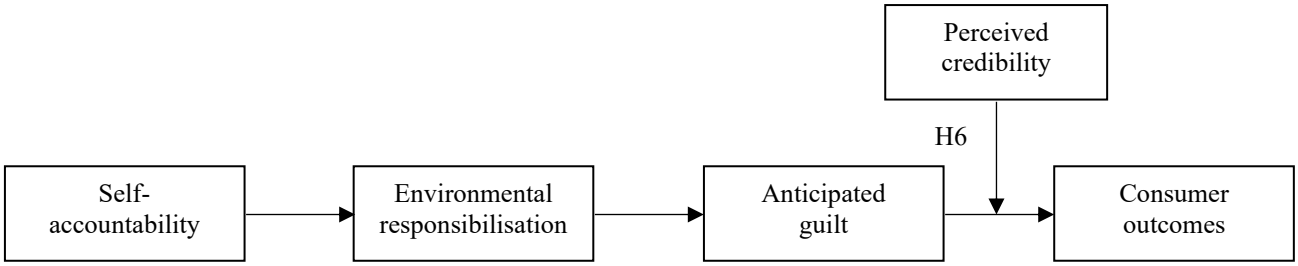


Figure 4.8 The research framework of study four

4.6.1. Pre-test for perceived credibility

A pre-test was conducted to verify the experimental manipulation of a carbon offset project with different levels of perceived credibility. Seventy participants (26 males, M_{age} = 39.1) recruited on Prolific were randomly allocated into either high or low perceived credibility conditions. A recent study systematically analyses the relationship between the

content of communications and the perceived credibility, and reveals that a voluntary carbon offset project could be perceived as more trustworthy if the communication contains more details illustrating the process, benefits, and carbon calculator of the carbon offset project (Guix et al., 2022). Based on this quantitative research, we created two versions of the introduction of a carbon offset project, with one version supposed to be highly credible whilst another version is supposed to be less credible (see Appendix D). After seeing the information on the flights' carbon emissions, participants in different conditions received these two versions of the introduction of a carbon offset project. Then, participants answered questions measuring perceived credibility (Cotte et al., 2005), and utilitarian and hedonic attitudes (Voss et al., 2003) toward the introduction of a carbon offset project. These measures exhibited a good level of reliability (perceived credibility, α = .885; utilitarian attitude, α = .883; hedonic attitude, α = .887). The results revealed that participants in the high-credibility condition perceived the carbon offset project as more credible (M = 5.41) than those in the low-credibility condition (M = 4.91, t_{68} = -2.35, p = .022). Furthermore, the two groups of participants did not differ in terms of utilitarian attitude (t_{68} = -0.89, p = .374), and hedonic attitude (t_{68} = .00, p = 1.00). Therefore, we considered this perceived credibility manipulation successful.

4.6.2. Method

Two hundred and sixty-two participants (95 males, M_{age} = 39.8) who live in the UK were recruited on Prolific in exchange for a participation fee. When asked “How many times have you flown in the past 12 months? (Count a return trip as two)?”, around 83% of participants indicated they took at least one flight in the past 12 months. In a 2×2 between-subjects design, participants were randomly assigned to one of four conditions: self-accountability vs. control, crossed with perceived credibility (high vs. low). The study’s

introduction informed participants that they would be taking part in a flying experience survey and reassured them that all their responses were completely anonymous and would be held in strict confidentiality.

The experiment procedure and manipulations followed the protocol implemented in study one, except for two differences. First, the self-accountability manipulation was in the form of the goal priming used in study three (self-accountability vs. control). Second, in study four, the introduction of the carbon offset project had two versions as examined in the above pre-test, rather than only one version for all participants in study one. All participants were randomly allocated a version (high vs. low), in which one version of the introduction is high-credible while another version is low-credible. Then, the rest of the procedure started. In study four, all measures employed displayed good reliability: environmental responsibilisation ($\alpha = .932$), anticipated guilt ($\alpha = .929$), and purchase intent ($\alpha = .917$).

4.6.3. Result

As H6 states, self-accountability priming could produce higher environmental responsibilisation, which leads to higher anticipated guilt, and compared with low perceived credibility, anticipated guilt leads to more favourable purchase intentions toward voluntary carbon offsets when perceived credibility is high. We examine this moderated mediation model with two mediators by employing the PROCESS macro model 87 (95% bootstrap confidence interval based on 5,000 bootstrap samples).

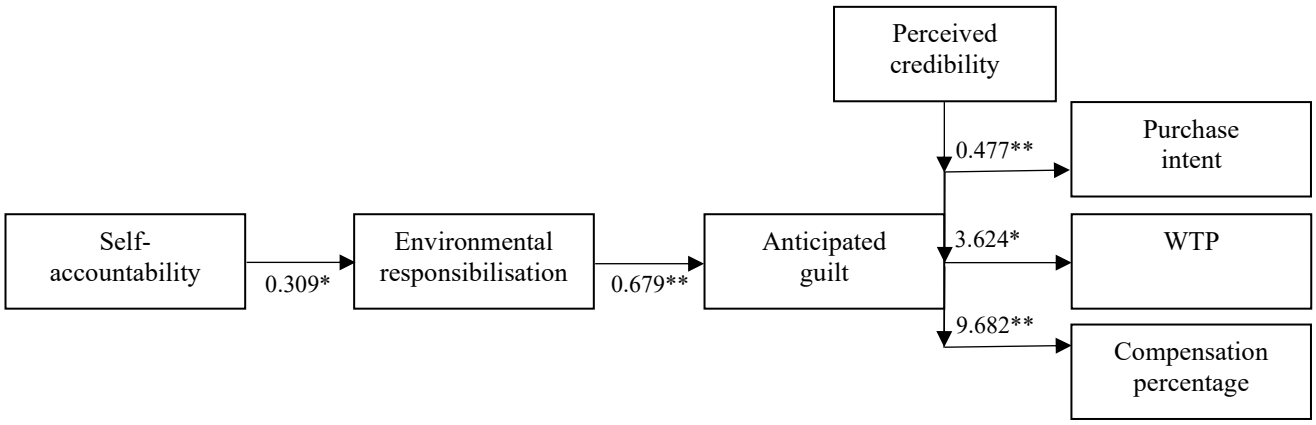


Figure 4.9 The research framework of study four with statistical results

Note: * means $p < .05$, ** means $p < .001$

Table 4.5 Study four results of moderated mediation for purchase intentions

		Environmental responsibilisation (M_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.018$	Constant	4.464	0.101	44.342	< .001
F (1, 260) = 4.666	Self-accountability priming (X)	0.309	0.143	2.161	0.032
$p = .032$					

		Anticipated guilt (M_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.299$	Constant	0.905	0.311	2.916	0.004
F (2, 259) = 55.418	Self-accountability priming (X)	0.039	0.152	0.258	0.796
$p < .001$	Environ responsibilisation (M_1)	0.679	0.065	10.397	< .001

		Purchase intent (Y_1)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.199$	Constant	3.958	0.403	9.824	< .001
F (5, 256) = 12.769	Self-accountability priming (X)	0.094	0.149	0.633	0.527
$p < .001$	Environ responsibilisation (M_1)	0.011	0.077	0.137	0.891
	Anticipated guilt (M_2)	0.065	0.078	0.836	0.404
	Perceived credibility (W)	-1.734	0.443	-3.912	< .001
	$M_2 \times W$	0.477	0.103	4.651	< .001
		Conditional indirect effect of X on Y_1 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Low perceived credibility	0.014	0.022	-0.029	0.062
	High perceived credibility	0.114	0.061	0.007	0.246
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Perceived credibility	0.101	0.059	0.006	0.236

Continued

		Willingness to pay (Y_2)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.259$	Constant	-0.166	4.781	-0.035	0.972
F (5, 256) = 17.957	Self-accountability priming (X)	0.129	1.762	0.073	0.942
$p < .001$	Environ responsibilisation (M_1)	0.539	0.911	0.591	0.555
	Anticipated guilt (M_2)	3.101	0.919	3.371	0.001
	Perceived credibility (W)	-10.711	5.261	-2.036	0.043
	$M_2 \times W$	3.624	1.216	2.979	0.003
		Conditional indirect effect of X on Y_2 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Low perceived credibility	0.651	0.391	0.028	1.516
	High perceived credibility	1.411	0.712	0.115	2.901
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Perceived credibility	0.761	0.448	0.054	1.773

		Compensation percentage (Y_3)			
Model summary	Predicting variables	β	SE	t	p
$R^2 = 0.201$	Constant	26.861	6.869	3.911	< .001
F (5, 256) = 12.851	Self-accountability priming (X)	-1.125	2.532	-0.444	0.657
$p < .001$	Environ responsibilisation (M_1)	1.659	1.309	1.267	0.206
	Anticipated guilt (M_2)	-0.982	1.322	-0.743	0.458
	Perceived credibility (W)	-37.671	7.559	-4.983	< .001
	$M_2 \times W$	9.682	1.748	5.541	< .001
		Conditional indirect effect of X on Y_3 via M_1 and M_2			
	Levels of moderator	β	SE	LLCI	ULCI
	Low perceived credibility	-0.206	0.321	-0.967	0.324
	High perceived credibility	1.825	0.901	0.179	3.735
		Index of moderated mediation			
		Index (B)	SE	LLCI	ULCI
	Perceived credibility	2.032	1.036	0.195	4.324

Note: β = unstandardised regression coefficient, SE = standard error, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval.

Results (see Table 4.5 and Figure 4.9) show that when participants perceive relatively low credibility of the carbon offset project, anticipated guilt can hardly produce carbon offset purchase intent (β = 0.014, SE = 0.022, 95% CI = -0.029 to 0.062) and can hardly motivate consumers to increase compensation percentage (β = -0.206, SE = 0.321, 95% CI = -0.967 to 0.324), while with high perceived credibility, anticipated guilt can more easily produce carbon offset purchase intent (β = 0.114, SE = 0.061, 95% CI = 0.007 to 0.246), WTP (β =

1.411, SE = 0.712, 95% CI = 0.115 to 2.901), and increase compensation percentage (β = 1.825, SE = 0.901, 95% CI = 0.179 to 3.735). However, it is worth noting that even in the low-credible condition of perceived credibility, anticipated guilt can also lead to favourable WTP toward carbon offsets (β = 0.651, SE = 0.391, 95% CI = 0.028 to 1.516). The reason might be that the perceived credibility of the carbon offset project in the low-credible condition is not low enough. In our pre-test, the credibility score of the low-credible carbon offset project is above 4.9, which is much higher than the midpoint of 4.0.

In addition, the conditional process analysis for the index of moderated mediation is significant, thus providing evidence for the hypothesised moderated mediation process (purchase intent, B = 0.101, 95% CI = 0.006 to 0.236; WTP, B = 0.761, 95% CI = 0.054 to 1.773; compensation percentage, B = 2.032, 95% CI = 0.195 to 4.324). Thus, it could be concluded (with 95% confidence) that there is a conditional indirect effect, that is, when the perceived credibility of the carbon offset project is high, consumers who feel anticipated guilt display more favourable purchase intentions toward voluntary carbon offsets.

4.6.4. Discussion

Study four also confirms the positive indirect effect of self-accountability on purchase intentions toward voluntary carbon offsets via environmental responsibilisation and anticipated guilt, which is consistent with H3. However, similar to studies two and three, study four also identifies a boundary condition of this positive indirect effect. The results of study four indicate that this indirect effect will be stronger when consumers perceive relatively high credibility toward carbon offset projects, which supports H6. Specifically, when facing carbon offset projects with high credibility, consumers who feel anticipated guilt would be more inclined to take part in the project. In study four, we confirm that the effect of anticipated guilt on purchase intentions is conditional upon the perceived credibility

of carbon offset projects.

4.7. General Discussion

In an effort to contain carbon emissions from air travel, airlines are piloting schemes to incentivize consumers to purchase voluntary carbon offsets (Guix et al., 2022). However, prior research shows that many of these voluntary schemes are not particularly effective as less than 10% of air passengers purchase voluntary carbon offsets (Zhang et al., 2019b). To encourage consumers to purchase voluntary carbon offsets, prior studies mainly highlight two approaches. Consistent with the first approach, marketers try to raise awareness and knowledge of voluntary carbon offsets (e.g., Denton et al., 2020). Consistent with the second approach, some studies suggest that marketers can promote voluntary carbon offsets by increasing the authenticity and credibility of carbon offset projects (e.g., Liu et al., 2021). However, both approaches fail to consider how to guide consumers through a decision process that encourages them to feel responsible and committed to curbing carbon emissions from air travel. When airlines introduce carbon offsets to air travellers, these airlines are passing some responsibility for containing the carbon emissions to air travellers. This research suggests a third approach to encourage positive responses to voluntary carbon offsets by triggering environmental responsibilisation, and then consumers are more willing to take responsibility for protecting the environment.

Through four online experiments, this research delineates a new approach to promoting the purchase of voluntary carbon offsets (see Table 4.6). These studies find that environmentally responsibilised consumers are more likely to purchase voluntary carbon offsets. Study one uncovers the positive indirect effect of self-accountability on purchase intentions toward voluntary carbon offsets via environmental responsibilisation and

anticipated guilt. Results show that self-accountability could make self-standards salient, and encourage people to stay tight with self-standards, which activates individuals to be environmentally responsible. Once individuals become environmentally responsible, a possible detrimental impact on the environment from individuals' decisions can trigger a sense of anticipated guilt. In turn, this sequential process promotes the purchase of voluntary carbon offsets. In study two, results indicate that self-accountability can only trigger environmental responsibilisation for consumers with relatively strong biospheric value. In study three, we find that for the indirect effect found in study one, environmental responsibilisation can more easily spark anticipated guilt when consumers perceive the airline with strong enCSR. Finally, study four's results show that in the last stage of the decision-making process perceived credibility further moderates the effect delineated in study one. Specifically, when consumers perceive the carbon offset project to be highly credible, consumers who feel anticipated guilt are more likely to purchase voluntary carbon offsets.

Table 4.6 Summary of hypotheses testing

Hypothesis	**Study**	**Result**	**Remark**
H1, H2, H3	Study 1	Supported	Self-accountability positively influences purchase intentions toward voluntary carbon offsets via triggering sequentially environmental responsibilisation and anticipated guilt.
H4	Study 2	Supported	The indirect effect of self-accountability on purchase intentions via environmental responsibilisation and anticipated guilt is stronger for consumers with higher biospheric value.
H5	Study 3	Supported	The indirect effect of self-accountability on purchase intentions via environmental responsibilisation and anticipated guilt is stronger when consumers perceive higher enCSR from airlines.
H6	Study 4	Supported	The indirect effect of self-accountability on purchase intentions via environmental responsibilisation and anticipated guilt is stronger when consumers perceive higher credibility from carbon offset projects.

4.7.1. Theoretical implications

This paper contributes to the literature on consumer responsibilisation by advocating a

psychological perspective of investigating consumer responsibilisation. The theory of consumer responsibilisation (Giesler & Veresiu, 2014) explicates consumer responsibilisation as a governmental process underpinned by sociology theoretical streams. Previous marketing research, thus, examines, through qualitative methods (e.g., ethnographic study and interview), how consumers react in consumption situations where consumers are asked to consider social issues (e.g., Cherrier & Türe, 2022; Eckhardt & Dobscha, 2019). By contrast, in the current research, we treat consumer responsibilisation as the starting point of a decision-making process and as a psychological status rather than a result of a long-term governmental process. In four studies, we manipulate consumers into a responsibilised status by adopting a psychological behaviour change technique and quantitatively delineate the role of environmental responsibilisation in the decision process of voluntary carbon offsets.

This research also contributes to the marketing literature on voluntary carbon offsets by identifying a new approach to promote voluntary carbon offsets. When airlines introduce carbon offsets to air travellers, these airlines are passing some responsibility of containing the carbon emissions to air travellers (Ritchie, Kemperman, & Dolnicar, 2021), thus this research returns to this origin and tries to identify a feasible approach to encouraging consumers to take responsibility for their carbon emissions. In the neoliberal logic, all responsibility, including protecting the environment (Giesler & Veresiu, 2014), must be fairly shared between different societal actors (Lemke, 2015). The current research suggests that consumers could be empowered to be environmentally responsible actors by implementing interventions that prime self-accountability. We demonstrate that once consumers are motivated to stay tight with self-standards, they are more inclined to consider the environmental consequences of their purchase decisions.

This paper makes a methodological contribution to the literature on self-accountability by providing a goal-priming design of self-accountability. Self-accountability is defined as

"a person's desire to live up to internal self-standards" (Peloza et al., 2013, p.105). Consistent with this definition, previous research applies a semantic priming outcome to prime self-accountability (e.g., Peloza et al., 2013; Tran & Paparoidamis, 2021). Semantic priming is a cognitive priming outcome that presents a set of interrelated concepts to activate associative nodes in the memory (Hutchison, 2003). Studies one and two in this research also apply this semantic priming outcome to prime self-accountability. Whereas goal priming is a behavioural priming outcome that encourages individuals to pursue a specific goal, and in the self-accountability context, to pursue a goal of staying tight with personal standards and responsibility. Compared with semantic priming, goal priming emphasises the momentum or the action inclination of self-accountability, which corresponds to the word "desire" in the definition (Papies, 2016). By creating and testing this goal priming design, this research enriches the alternative toolbox of self-accountability priming, future researchers can apply different self-accountability priming designs based on different needs. For instance, this research applies both priming designs to generalise the research findings regarding priming outcomes.

4.7.2. Practical implications

This research offers two important managerial takeaways. First, airlines need to be careful about how to build an environmental-friendly brand image and how to help consumers perceive good enCSR. Even consumers who are environmentally responsibilised, won't be very likely to buy voluntary carbon offsets if airlines cannot convey good enCSR to consumers efficiently. For airlines that actively take environmental corporate responsibility, consumers attempt to understand companies' motives embedded within marketing activities, especially for CSR involvement (Heider, 1958; Kelley, 1967; 1973). There are mainly two kinds of motives, one is self-serving (i.e., increase profits) and another is public-serving (i.e.,

help with public problems). When consumers feel that an airline propels enCSR initiatives for financial gain rather than the public welfare, they perceive weak enCSR from this company, then consumers would not be positively responsive to the sustainable project run by this company. Therefore, companies might need long-term endeavours to build a strong environmental-friendly brand image and share genuine motives and envision with consumers.

Second, consumers could perceive different levels of credibility associated with different carbon offset projects depending on the nature of the communications approach (Becken & Mackey, 2017). Airlines will need to be cautious when communicating their carbon offset projects to air travellers, ensure that carbon offset communications are trustworthy, and prevent the diffusion of misleading information. To this end, airlines should consider providing third-party credentials, briefly presenting carbon calculations and numbers, and administrating feedback and announcement when significant achievements are reached (Guix et al., 2022). When consumers perceive a carbon offset project as highly credible, they are more likely to contribute to curbing carbon emissions by purchasing carbon offsets.

4.7.3. Limitations

Although this essay makes several significant contributions, there are a few limitations. Firstly, the material for perceived credibility may be different in other dimensions. In study four, to create the material for perceived credibility, two versions of communications for a carbon offset project have been produced underpinned by recent research about the credibility of aviation carbon offset projects. This research shows that providing more specific information about the process, carbon calculation, and benefits of

the project can increase the perceived credibility of a carbon offset project (Guix et al., 2022). In the pre-test, participants perceive these two versions of communications with different levels of credibility, and show no differences between these two communications regarding utilitarian and hedonic attitudes. However, it is still possible that these two communications are different in other unknown dimensions. Future research may investigate further the credibility of carbon offset projects and then help achieve higher levels of manipulation for perceived credibility.

Secondly, the effectiveness of priming might be challenged. Even though the priming intervention applied in studies one and two is identical to the priming intervention in a previous paper (Peloza et al., 2013), and the priming intervention applied in studies three and four is adapted from a previous paper (Evans et al., 2013), alternative explanations might still exit. For example, pre-existing different orientations of environmental responsibilisation might be able to explain the results. Hence, it is not categorically sure the operation of priming in the empirical parts produces the observed results. A pre-test or a manipulation check can help strengthen hypothesis tests and can help researchers to confirm whether priming effect occurs or not. Future studies may check these interventions again to facilitate the process of analysis.

Thirdly, environmental responsibilisation might be a personal characteristic to some extent. The scale of environmental responsibilisation is adapted from a responsibility scale in a prior paper (Scholl et al., 2017). Both in that paper and this essay, the scale is used to measure a factor that is influenced by a manipulation, however, the factor measured by this scale might still be a personal characteristic to some extent. There is a possibility that participants recruited in self-accountability conditions have higher environmental responsibilisation than those recruited in control conditions before the start of the experiments.

Another limitation is the inadequate consideration of flight price and flight length when measuring the dependent variables. The dependent variables, namely WTP and compensation percentage, involve participants deciding the percentage of the flight ticket fee they are willing to pay for a carbon offset and the percentage of CO_2 emissions they wish to compensate through purchasing a carbon offset. It is important to note that the price of the flight could influence participants' decisions regarding WTP, while the length of the flight might impact their decisions regarding the compensation percentage. Future research could delve into investigating the potential moderation effects of flight price and flight length, thus further enhancing our understanding of these variables.

4.7.4. Future research directions

Future studies could further the research on environmental responsibilisation in purchasing voluntary carbon offsets at least in three directions. First, future research could explore a practical design or methods to prime self-accountability in a real business context. Prior research shows that the purchase context where others in the present could subtly activate self-accountability and then encourage consumers to purchase sustainable products (Peloza et al., 2013). However, the presence of others is not a practical and efficient way for airlines to manipulate, especially for consumers who purchase flight tickets online. A public-interest advertisement issued by NGOs or airlines might be good, but other more practical methods can be also explored. For example, launching a gamification project and embedding self-accountability priming in it (c.f., Mulcahy, Russell-Bennett, & Iacobucci, 2020).

Second, future research could envision and explore other possible mechanisms by which environmental responsibilisation influences purchase decisions, rather than anticipated guilt. Research shows that negative emotions may backfire and cause reactant

reactions, particularly for people who are sensitive to feeling guilt (Agrawal & Duhachek, 2010; Staunton, Alvaro, & Rosenberg, 2020). Consumers may even apply motivated reasoning to deal with guilt per se rather than the origin of the guilt (Antonetti & Baines, 2015). Therefore, measuring anticipated guilt in an experiment is somewhat risky. Future studies could investigate what environmental responsibilisation can cause and if there are any positive emotions produced or other possible factors that could take an effect.

Third, researchers who feel intrigued by consumer responsibilisation can explore other ways of changing the level of consumer responsibilisation rather than through self-accountability priming. Possible questions may include: what other factors can increase the level of responsibilisation? What factors may reduce the level of consumer responsibilisation thus companies should be cautious. Furthermore, besides the environmental area, what other areas can consumer responsibilisation be applied? For instance, prior research has qualitatively studied consumer responsibilisation in the area of food insecurity (Eckhardt & Dobscha, 2019). Future research, hence, could quantitatively investigate consumer responsibilisation in the area of food insecurity or any other areas.

4.7.5. Conclusion

To conclude, this research quantitatively investigates consumers' environmental responsibilisation in the area of aviation voluntary carbon offsets. Through four online experiments, this research delineates a decision process in which environmental responsibilisation can be activated by self-accountability priming, and responsibilised consumers can feel anticipated guilt of not counterbalancing carbon emissions from flying, which encourages consumers to buy voluntary carbon offsets. By identifying this decision process of purchasing voluntary carbon offsets, this research contributes to the literature on

consumer responsibilisation and self-accountability both theoretically and methodologically. Finally, some future research directions are suggested.

5. Chapter Five: Contributions, Implications, and Conclusions

Through these three essays, this thesis has examined the role of priming in the context of sustainable consumption. Reflecting on the findings and contributions of the the thesis, this chapter discusses the contributions, implications, limitations, and conclusions, which presents the theoretical and methodological contributions of this thesis (Section 5.1), implications for future research and marketing practices (Section 5.2), limitations of the current thesis (Section 5.3), and ends with the conclusion (Section 5.4). The contributions and implications of this thesis are outlined in Table 5.1 and discussed further in the following sections.

5.1. Contributions

5.1.1. Theoretical contributions

This thesis offers three substantive conceptual contributions. First, to guide future research and inform marketing practices, it scans and synthesises the fragmented literature on sustainable consumption priming and integrates the findings into a comprehensive framework that maps the research boundary of the area. Second, it identifies and delineates a psychological mechanism that can explain how and when priming may negatively influence sustainable consumption. Third, this thesis identifies and delineates a psychological mechanism that consumers can be empowered to take responsibility for protecting the environment when making purchase decisions. Through these three contributions, this thesis systematically examines the boundary conditions of priming in sustainable consumption, specifically in the context of aviation voluntary carbon offsets. Under some circumstances, priming may dwindle sustainable consumption while under some other circumstances, priming interventions can encourage consumers to produce more sustainable consumption.

Table 5.1 Summary of the contributions and implications of the thesis

	Contribution Themes		Implication Themes	
Essay	**Theoretical**	**Methodological**	**Future Research**	**Marketing Practices**
One	It integrates scattered literature and provides a comprehensive framework that maps the research status and boundary of the area Essay one provides a more comprehensive definition of priming and summarises the four constituents of priming (i.e., outcomes, methods, stimuli, and contexts of priming)	Essay one proposes a new analysing framework for understanding moderation factors, which locates factors in a tri-dimensional coordinate system It delineates a new framework to understand priming stimuli, which gauges the sensory richness and engagement level of stimuli	Provides a research agenda that suggests potential research questions in five directions: type of priming, cognitive processes, boundary conditions, consumer type, and geographic effect	This literature review provides a comprehensive mapping that highlights different characteristics of priming intervention and other related factors, which could help the deployment of priming intervention
Two	Identifies a psychological mechanism to elucidate how consumers shift the moral burden away when having non-sustainable consumption This essay tests cognitive self-serving justification quantitively in the sustainable consumption area		Future research can explore other dimensions of psychological distances Other possible mechanisms (e.g., willful ignorance) that may explain why consumers are not engaging in the sustainable purchase How to encourage more moral cleansing behaviour rather than motivated reasoning	Companies need to be cautious about not providing cognitive resources of motivated reasoning when building sustainable brand images and conveying environmental information
Three	Identifies a psychological perspective to understand consumer responsibilisation Delineates the decision process showing the role of consumer responsibilisation in purchasing voluntary carbon offsets	Provides and tests a goal-priming design of self-accountability, which enriches the toolbox of self-accountability priming	Explores a practical design to prime self-accountability in a real business context Investigates other possible mechanisms by which environmental responsibilisation influences purchase decisions, rather than anticipated guilt Explores other ways to activate consumer responsibilisation rather than self-accountability priming	Companies need long-term endeavours to build a strong environmental-friendly brand image and share genuine motives and envision with consumers Airlines need to combine responsibilisation interventions with actions to increase the perceived credibility of carbon offset projects

This thesis scans and synthesises the fragmented literature on sustainable consumption priming and integrates the findings into a comprehensive framework. This framework is needed for some reasons. First, the cognitive processes and conditionalities of priming are under-explored in general (Albarracin, & Dai, 2021), and the lack of theoretical explication on priming is particularly prominent in the sustainable consumption area (Minton et al., 2017). This theoretical deficiency cannot help constrain reactant responses from priming interventions. Second, although there have been some studies exploring the cognitive processes and conditionalities of priming in sustainable consumption, it is unclear what prior studies have done and what are the strengths and weaknesses of these studies. Third, marketers face difficulty in the deployment of priming interventions because the characteristics of priming interventions are currently ambiguous, especially for the conditionalities of priming.

To address these issues, this thesis scans, examines, and adds insight into how priming is applied and evolves in the area of consumers' sustainable consumption, synthesises evidence, and integrates extracted information into a comprehensive framework that maps the general, theoretical, and methodological characteristics of existing studies. In doing so, this thesis summarises the characteristics of cognitive processes and conditionalities in prior studies, maps the research status and boundary of this area, identifies strengths and weaknesses of these studies, and aids marketers to apply priming interventions. Through this framework, research gaps are identified and future research questions are proposed in five directions: type of priming, cognitive processes, boundary conditions, consumer type, and geographic effect.

Based on the proposed framework, this thesis then explores the cognitive process and boundary condition of priming interventions by empirically testing how and when priming may negatively influence sustainable consumption. This work is needed because current

research is not enough to explain why CSR initiatives are not as effective as companies had expected (Bradshaw & Zwick, 2016, Grigore et al., 2021; Laszlo & Brown, 2014). For example, in the area of aviation voluntary carbon offsets, previous research argues that consumers are not buying carbon offsets because they are not aware of this product (Denton, Chi, & Gursoy, 2020; Kim, Yun, Lee, & Ko, 2018; Lu & Shon, 2012). However, the purchase rate of aviation voluntary carbon offsets is significantly lower than the awareness rate of it (c.f., Kim et al., 2018; Lu, & Wang, 2018; Zhang, Ritchie, Mair, & Driml, 2019). Therefore, marketers are interested in understanding why some consumers are not buying carbon offsets even though they are aware of the product (Liu, Jiang, & Gleasure, 2021).

This thesis, underpinned by the moral self-regulation framework (Sachdeva, Iliev, & Medin, 2009) and construal-level theory (Trope & Liberman, 2010), addresses this issue by identifying the role of motivated reasoning in non-sustainable consumption and by delineating the conditions when motivated reasoning can be stronger. Through three online experiments, this thesis finds that when primed with a close psychological distance, consumers who are informed of the negative impact of taking a flight on the environment are more motivated to justify their behaviour of flying, and then show less interest in purchasing voluntary carbon offsets. Consumers who have higher levels of motivated reasoning not only show less interest in purchasing voluntary carbon offsets but also become more reluctant to behave pro-environmentally in general. By empirically testing the negative effect of motivated reasoning on purchase outcomes, this thesis provides an alternative explanation to explain why many consumers are not purchasing voluntary carbon offsets even after being aware of this product. This thesis also shows why and when priming interventions may be detrimental to sustainable consumption.

After exploring the negative side of priming in purchasing voluntary carbon offsets, this thesis explores how to promote consumers to purchase them by employing priming

interventions. Drawing upon the theory of consumer responsibilisation (Giesler & Veresiu, 2014) and self-standards theory (Stone & Cooper, 2001; Thibodeau & Aronson, 1992), this thesis proposes that self-accountability priming could activate consumer responsibilisation, thus, in turn, engendering anticipated guilt and purchase intentions toward voluntary carbon offsets. Through four online experiments, this decision process is supported. Results also show that the indirect effect of self-accountability on the purchase of carbon offsets is conditional upon biospheric value, perceived enCSR, and perceived credibility. The decision process identified a quantitative research approach for studying consumer responsibilisation from a psychological perspective. In the empirical studies conducted within this thesis, aviation voluntary actions have been selected as the specific empirical context for investigating sustainable consumption. It is anticipated that the findings obtained from this context can be extrapolated and applied to other contexts in future research. For example, future studies could explore the role of psychological distance and motivated reasoning in sustainable consumption within contexts such as electric vehicles or fashion goods. By conducting research in these different contexts, a more comprehensive understanding of the underlying psychological mechanisms influencing sustainable consumption can be achieved.

5.1.2. Methodological contributions

This thesis offers two methodological contributions. First, it contributes to the growing number of studies that investigates priming interventions in sustainable consumption. To be specific, this thesis provides a new analysing framework for understanding moderation factors, which locates factors in a tri-dimensional coordinate system. Future research can apply this framework to understand moderators regarding dependence/independence, contextuality, and susceptibility. Researchers can use this framework to decide which factors that have been studied should be further tested in what context, choose from several

alternative factors, or help design experiments. Added to this, is a new two-dimensional framework for priming stimuli, in which priming stimuli are gauged on sensory richness and engagement level. Future research can use this framework to design and create new stimuli and choose appropriate priming stimuli in empirical studies based on the needs.

Second, this thesis designs and tests a goal-priming outcome for self-accountability priming, which enriches the toolbox for self-accountability priming. Previously, the main priming design for self-accountability is semantic priming and it has been used in different studies (e.g., Peloza et al., 2013; Tran & Paparoidamis, 2021). Semantic priming is a cognitive priming outcome that presents a set of interrelated concepts to activate associative nodes in the memory (Hutchison, 2003), while goal priming emphasises the momentum or the action inclination of self-accountability (Papies, 2016). By providing this new priming design for self-accountability, research findings can be generalised by employing different designs regarding priming outcomes.

5.2. Implications

5.2.1. Implications for future research

Through the integration and mapping of the research on priming in sustainable consumption across different consumption contexts, this thesis highlights five directions for future research, which includes several potential research questions for the type of priming, cognitive processes, boundary conditions, consumer type, and geographic effect (see Table 2.13). Advancing priming research is valuable in promoting sustainable consumption since the evidence shows that priming promises favourable pro-environmental effects (Sunstein & Thaler, 2003) and is potentially both effective and cost-efficient (Benartzi et al., 2017). Also, priming seems to be well accepted by the public in many areas, which makes it a practical

choice for marketers and other stakeholders (Sunstein & Reisch, 2019). Thus, future research could regard these suggested five directions as the starting point to strengthen our understanding of the priming interventions in sustainable consumption.

In terms of a more specific focus regarding the negative effect of priming on sustainable consumption, the thesis identifies a mechanism that explains why and when consumers become reluctant to purchase carbon offsets. Future research might extend this finding by exploring the effect of other dimensions of psychological distance (e.g., temporal), and by investigating other potential mechanisms that can delineate how priming decreases sustainable consumption (e.g., willful ignorance). As for the positive effect of priming on sustainable consumption, the thesis identifies a decision process in which consumer responsibilisation plays a pivotal role. Future studies can explore other processes that consumer responsibilisation influences purchase decisions rather than anticipated guilt, since negative emotions may backfire and cause reactant reactions, particularly for people who are sensitive to feeling guilt (Agrawal & Duhachek, 2010; Staunton, Alvaro, & Rosenberg, 2020). Besides, future research can explore other ways to activate consumer responsibilisation rather than self-accountability priming and take a broader view to investigate factors that may increase or decrease consumer responsibilisation.

5.2.2. Implications for marketing practices

This thesis has highlighted three takeaways for companies, especially for airlines. Consumers can easily be motivated to justify their non-sustainable consumption and shift their moral burden away. Airlines, thus, should be cautious when communicating enCSR information. For example, if airlines emphasise that they have done a lot in optimising fuel efficiency in order to contain carbon emissions, consumers can presumably easily justify

their flying trip even by only choosing to fly with this airline without buying voluntary carbon offsets. For airlines that expect to sell more carbon offsets, they should not provide any cognitive resources for consumers' motivated reasoning during enCSR communication, and take a comprehensive perspective to build a sustainable strategy. Airlines need to validate whether their strategy successfully enhances perceived enCSR without providing motivated reasoning resources.

Moreover, airlines need to ensure that their perceived enCSR is high from the viewpoint of consumers. Evidence shows that consumers attempt to understand companies' motives embedded within CSR initiatives (Heider, 1958; Kelley, 1967; 1973). To assure that consumers believe the public-serving motive behind the CSR initiatives, and then perceive high enCSR toward airlines, airlines need long-term endeavours to build a strong environmental-friendly brand image and share genuine motives with consumers. In addition, airlines require good communication of their carbon offset projects to guarantee the strong perceived credibility of their projects, because when consumers perceive a carbon offset project as highly credible, they are more likely to contribute to curbing carbon emissions by purchasing carbon offsets. Some possible approaches to increase perceived credibility may include providing a carbon calculator, seeking a trustworthy third-party accreditation, and increasing the level of transparency of the carbon offset project (Guix et al., 2022).

5.3. Limitation

For empirical studies of this thesis, the effectiveness of priming might be challenged. Without manipulation checks, it might be doubted whether priming was operating in the studies or not. There were no manipulation checks in the studies because of two reasons. Firstly, the priming applied in empirical studies follows previous protocols and prior studies

have checked the effectiveness of the priming. For social psychological distance priming, it has been tested to be effective to induce different psychological distances in prior studies (Eyal, Liberman, & Trope, 2008; Paharia et al., 2013; Pronin & Ross, 2006; Zezelj & Jokic, 2014). For instance, studies show that when primed with a third-person lens (distant social psychological distance), participants judge transgressions more harshly than primed with a first-person lens (close social psychological distance) (Eyal et al., 2008; Zezelj & Jokic, 2014). Also, research shows that when encountering the employment of sweatshop labour, participants tend to rationalise the use of questionable labour when considering a vacation for themselves than for their friends (Paharia et al., 2013). As for self-accountability priming, it has been tested to be effective in prior studies as well (c.f., Evans et al., 2013; Peloza et al., 2013; Tran & Paparoidamis, 2021). For instance, research indicates that when primed with self-accountability, participants become more likely to purchase products with stronger ethical attributes (Peloza et al., 2013).

Secondly, some researchers argue that embedding manipulation checks within an experiment can also act as interventions which initiate new processes that would otherwise not occur, thus may in practice result in weaker hypothesis tests (Gruijters, 2022; Hauser, Ellsworth, & Gonzalez, 2018). Apart from prior studies, in study three of chapter four (see section 4.5.1), a pre-test was conducted to confirm the operation of the self-accountability priming (Peloza et al., 2013; Tran & Paparoidamis, 2021). Therefore, due to the tests in prior studies and the pre-test in section 4.5.1, I would like to argue that priming was operating in the studies.

However, it is not able to guarantee the effect of the priming considering alternative explanations to explain the effects observed in the studies. The effects observed in the studies might be caused by pre-existing differences between different conditions. For example, pre-existing different attitudes toward sustainability or travelling may cause the

different levels of motivated reasoning in chapter three, and pre-existing different orientations of environmental responsibilisation might be able to explain the results in chapter four. Hence, it is not categorically sure the operation of priming in the empirical parts produces the observed results. A pre-test or a manipulation check can help strengthen hypothesis tests through some techniques such as the implicit association test (IAT). This limitation can be overcome by future research with a pre-test or a manipulation check to confirm the operation of priming, thus helping confirm the causality inference between priming and subsequent factors.

5.4. Closing Remarks

Amid severe environmental challenges such as climate change, companies launch different environmental CSR projects and provide sustainable products and services. As an effective and cost-efficient behavioural change technique, priming has attracted both researchers' and marketers' attention. To further understand how priming work in the context of sustainable consumption, this thesis integrates fragmented and scattered evidence into a conceptual framework and maps the research status and boundary of priming in sustainable consumption, and then further delineates how priming may increase/decrease sustainable consumption. This final section offers some concluding thoughts.

Priming interventions can produce both *consistent* and *reactant* reactions. Prior research is deficient in investigating how and when priming leads to these two kinds of reactions. Hence, this thesis identifies two mechanisms by which priming can increase or decrease sustainable consumption. In the context of taking a flight, motivated reasoning plays a vital role in leading to less sustainable consumption. Through motivated reasoning, consumers can easily justify their non-sustainable consumption and shift their moral burden

away from the purchasing context. When consumers are primed with close psychological distance, the information about the negative environmental consequences of taking a flight can particularly cause motivated reasoning.

In terms of the mechanism by which priming can increase sustainable consumption, consumer responsibilisation plays a key role in empowering consumers to actively take responsibility for protecting the environment when making purchase decisions. Self-accountability priming can activate the status of consumer responsibilisation, and in the context of taking a flight, consumer responsibilisation can generate anticipated guilt of not offsetting the carbon emissions from flying, thus encouraging consumers to purchase carbon offsets. This effect is stronger when consumers have higher biospheric value, perceive higher enCSR toward airlines, and perceive higher credibility toward carbon offset projects.

In summary, this thesis shows that priming interventions can help companies promote sustainable consumption, but companies need to care about the psychological conditionalities of priming interventions for different priming outcomes, methods, stimuli, and contexts, different consumers, and different consumption contexts. Priming can either spark motivated reasoning and then dwindle sustainable consumption, or it can empower consumers to be environmentally responsible. This research journey through priming interventions in sustainable consumption not only provides theoretical contributions to the literature on several areas and practical implications for marketers but also hopefully inspires future researchers to further investigate the theoretical aspects of priming in sustainable consumption and its many applications that can help to spur sustainability.

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Chapter 1

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Chapter 2

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Appendix

Chapter 2

Essay one appendix A: The protocol of scoping review

Essay one is a systematic scoping review that aims to scan and examine how pro-environmental priming is applied and evolves in the area of consumers' sustainable purchasing behaviour. The purpose of this essay is to identify the current research status of the area of sustainable consumption and pro-environmental priming to explore the research gaps that provide the chance to make contributions. Below is the protocol for the scoping review.

Review Objective. Priming has been applied in marketing widely, including sustainable consumption. The objective of this scoping review is to scan, examine and add insight into how the pro-environmental priming is applied and evolves in the area of consumers' sustainable purchasing behaviour. Furthermore, it will explore the new research agenda and identify opportunities for future research. To achieve this objective, the reviewers will search and map empirical research in this area, as well as different kinds of reviews, and then represent it as a mapping or charting of the extracted data graphically.

Research Questions.

A. What kind of priming outcomes have been applied in the area of individual consumers' sustainable purchasing intention and behaviour?

B. What theories have been applied for describing, explaining, and predicting how pro-environmental priming influences consumers' sustainable purchasing intention and behaviour?

C. What factors have been studied in this area as moderators, mediators, or other variables in

terms of pro-environmental priming?

D. What research findings have been identified and disseminated, and are there any research gaps existing?

Eligibility Criteria. The intention is to include papers that focus on how pro-environmental priming influences sustainable consumption, both purchasing intention and behaviour, with the following types of papers: 1) empirical research papers that utilise quantitative research methods; 2) empirical research papers that apply mixed methods; 3) all kinds of reviews that describe, synthesise, disseminate, compare, and assess the existing evidence, research trends, research issues, and theories development. In view of the limited language capability and time resources, we will only search for papers written in English since 2000.

Review Framework & Process. The foundation used to underpin the scoping review is Peters et al.'s (2015) framework combined with Levac, Colquhoun, and O'Brien's (2010) modifications to the original proposed by Arksey and O'Malley (2005). However, some elements of these two frameworks will be changed and supplemented. Based on these two frameworks, scoping reviews rarely emphasise the synthesis of knowledge nor the appraisal of research quality. But in the coming scoping review, writers will try to synthesise some parts of the knowledge and assess the quality of some research to some extent.

The process of the scoping review will include: 1) identify the review objective and research questions; 2) identify the research and review papers by balancing feasibility with breadth and comprehensiveness; 3) select papers and extract data with an iterative approach; 4) chart the data incorporating numerical summary and qualitative thematic analysis; 5) collate, summarise, and

report results, also synthesise some knowledge and assess the quality of some research to shed light on potential future research directions. Specifically, regarding the second step and the third step, papers identification and selection, the whole searching and selection process will follow the flowchart below (see Figure 0.1).

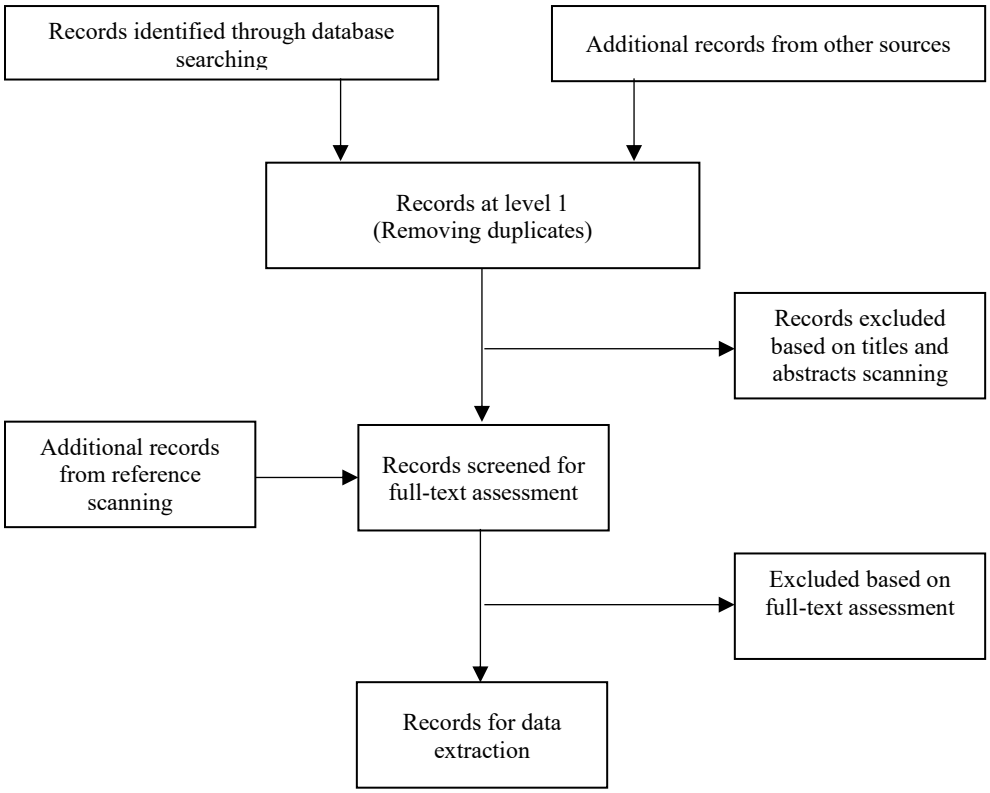


Figure A0.1 Study flow for paper searching and selection (Peters et al., 2015)

In order to increase the validity and reliability of the review, there will be two independent reviewers. Also, a third reviewer (this should be a senior academic) is necessary in case any post-discussion disagreements exist between the two independent reviewers. In the first stage of paper selection based on title and abstract scanning, a pilot selection practice will be conducted prior to commencing screening. During the pilot selection practice (30 papers randomly selected from the search results), the two independent reviewers will discuss selection criteria and compare the selection results then deliberate any disagreement. After the inter-rater agreement between them become 100%, they can start the formal screening process for stage one. During the process of

formal selection, the two independent reviewers will compare selection results with each other by finishing scanning every 100 papers and trying to reach an agreement completely. If there will be any inextricable disagreements, the third reviewer will get involved and decide the selection result.

Once stage one is finished, the two reviewers will start to scan references of the remaining papers and discuss any disagreements. Similarly, if there will be any inextricable inconformity, the third reviewer will get involved. The selected papers from reference scanning will be added to the paper pool. Before commencing the full-text scanning, there will be a pilot selection practice (30 papers randomly selected from the remaining papers), and the process and principles in this part are identical to stage one selection. In terms of data extraction, full data abstraction began only after a sufficient agreement had been obtained in the pilot data extraction practice. Subsequently, each included study was abstracted by the first reviewer, and verified by the second reviewer.

Information Sources & Search Strategy. Comprehensive literature searches will be conducted first in the below electronic databases: *Google Scholar*, *PsycEXTRA (APA)*, *Academic Search Complete*, *Business Source Complete (EBSCO)*, *SCOPUS (Elsevier)*, *Emerald Journals*, *Guilford Journals Online*, *JSTOR ebooks and journals*, *ASSIA Applied Social Sciences Index and Abstracts (ProQuest)*, *Sage Journals Online*, *Wiley Online Library*. The search terms will be all possible pair combinations between “green, sustainable, environmental, and ethical” and “priming, prime, and primed”. However, this might be adjusted iteratively during the searching process, especially when some important keywords in papers are identified. After stage one selection, reviewers will scan the reference lists of remaining papers and add appropriate papers into the paper pool, then start full-text selection.

Data Extraction & Collection. After completing the full-text selection, all remaining papers will be scanned for data extraction. All elements and information that need to be extracted are

listed in Table 0.1.

Table A0.1 Extraction Elements & Fields

No.	Fields	No.	Fields
1	Year of publication	8	Population and sample size (if applicable)
2	Author	9	Independent variables (if applicable)
3	Journal name	10	Mediators (if applicable)
4	Country(ies) of origin	11	Moderators (if applicable)
5	Purpose	12	Other variables (if applicable)
6	Theories & Frameworks	13	Consumption context or category
7	Method	14	Research findings

Potential Contribution. The scoping review would outline the current research status of sustainable consumption in terms of priming. Help researchers explicitly identify what variables have been investigated, and what main theories were used before. Through the course of finding the boundary of the research area, current arguments, research questions, and practical questions could be signified, and research agendas would emerge.

Essay one appendix B: The clusters of moderators

1. *Pro-environmental orientation*, such as pro-environmental attitudes and orientations;

2. *Motivational orientation*, such as a behavioural approach system and a self-regulatory focus;

3. *Green signal*, such as green logo and organic label;

4. *Product attributes* such as product conspicuousness, and electricity usage of a vehicle;

5. *Dieting orientation*, such as dieting intention and self-control in dieting;

6. *Cost*, such as price premium and carbon tax;

7. *Habit attributes*, such as habit strength and past buying experience;

8. *Physiological status* is the cluster of hunger status and weight status;

9. *Message attributes*, such as assertiveness of the message and message type;

10. *Framing*, frame of gain and loss and cause-related marketing framing;

11. *Cognitive load*;

12. *Psychological attributes*, such as construal level and individual creativity;

13. *Ethical mindset* can be grouped into rule-based or outcome-based mindsets;

14. *Review valence*;

15. *Guilt appeal*. Stimuli tend to evoke the feeling of guilt;

16. *Health knowledge*;

17. *Mindfulness* represents individual dispositional differences in attention to the present moment and experience;

18. *Moral identity*;

19. *Psychological stress*;

20. *Attributed motivation*, is how consumers attribute the reason of done sustainable behaviour;

21. *Microenvironment*, such as music genre of background music and choice architecture.

Essay one appendix C: The forms of priming stimuli

1. *Auditory*, includes background music and auditory message;

2. *Product options*, different product options in different conditions;

3. *Image (evaluate)*, evaluate image or photographic ads on several aspects;

4. *Image (search)*, search icons among several pictures;

5. *Questionnaire*, some items within questionnaires are different in different conditions;

6. *Value ranking*, rank several values (different values presented in different conditions);

7. *Imagination*, instructions ask participants to imagine, such as a conversation or a person's behaviour;

8. *Writing*, writing an experience from a specific scenario;

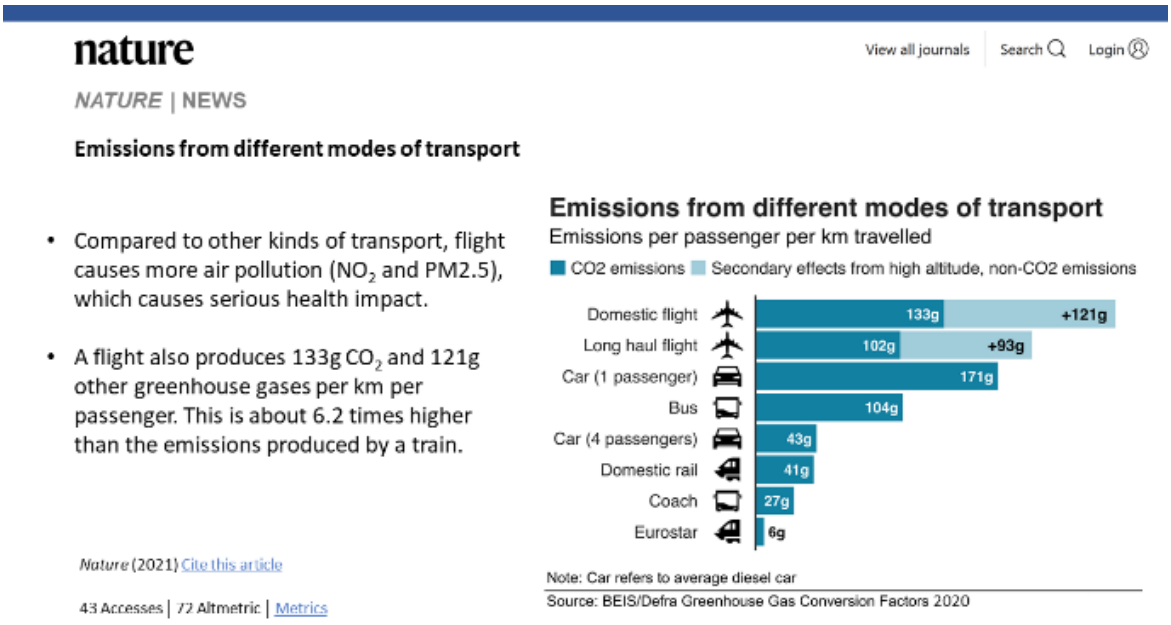
9. *Image (answer)*, answering image-related questions with the instructors face-to-face;

10. *Food* sample, food samples that can be smelt, touched and seen by participants.

Chapter 3

Essay two appendix A: The environmental information of flights

The condition of environmental information present:



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Emissions from different modes of transport

- Compared to other kinds of transport, flight causes more air pollution (NO_2 and PM2.5), which causes serious health impact.
- A flight also produces 133g CO_2 and 121g other greenhouse gases per km per passenger. This is about 6.2 times higher than the emissions produced by a train.

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Emissions from different modes of transport

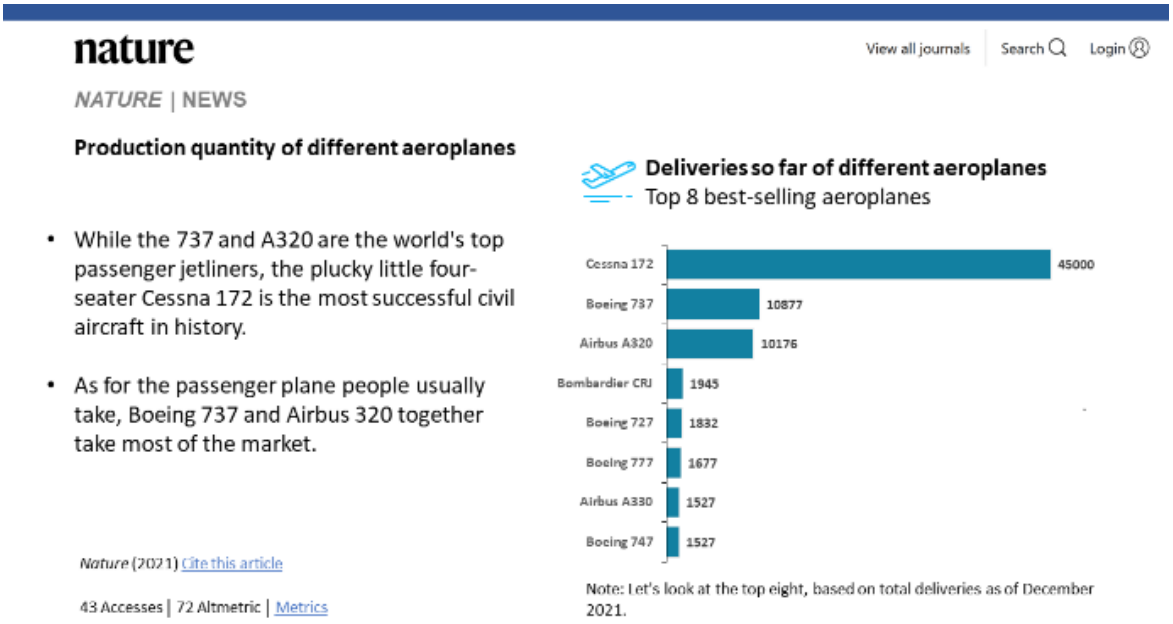
Emissions per passenger per km travelled

CO2 emissions | Secondary effects from high altitude, non-CO2 emissions

Note: Car refers to average diesel car

Source: BEIS/Defra Greenhouse Gas Conversion Factors 2020

The condition of environmental information absent:



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Production quantity of different aeroplanes

- While the 737 and A320 are the world's top passenger jetliners, the plucky little four-seater Cessna 172 is the most successful civil aircraft in history.
- As for the passenger plane people usually take, Boeing 737 and Airbus 320 together take most of the market.

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Deliveries so far of different aeroplanes

Top 8 best-selling aeroplanes

Note: Let's look at the top eight, based on total deliveries as of December 2021.

Essay two appendix B: An introduction to a carbon offset project

Flying causes greenhouse gas emissions (e.g., CO_2). To counteract these emissions, airline firms have brought out their Carbon Offsetting Project, and people can pay the carbon offset fee when they purchase a flight ticket.

Please see the project below:

Fly carbon neutral with our high-quality carbon offsets

Our projects combine the protection of forests and planting new trees, as well as support for local communities around the world.

Find out more about our offset projects.

Cost to fly carbon neutral: depends on the air route and aeroplane model.

All the carbon offset fees will be used to run the Carbon Offsetting Project.

Chapter 4

Essay three appendix A: Self-accountability priming

I. Self-accountability priming (semantic priming) (used in studies one and two)

Cooking: “pans,” “spices,” “cook,” “boil,” “frying,” “bake,” “protein,” “butter,” “oil,” “ginger,” “garlic,” and “tablespoons”.

Children: “play,” “sandbox,” “toys,” “childhood,” “boy,” “girl,” “learn,” “infants,” “pre-schooler,” “books,” “diapers,” and “grow up”.

Self-accountability: “accountable,” “standards,” “responsible,” “empowerment,” “justification,” “blame,” “obligation,” “punishing,” “rules,” “self-worth,” “self-monitoring,” and “the ought-self”.

Furniture: “chairs,” “rug,” “ottoman,” “bench,” “bookshelf,” “table,” “cabinet,” “mattress,” “desk,” “bath,” “sofa,” and “mirror”.

II. Self-accountability priming (goal priming) (used in studies three and four)

From 1-definitely false to 5-definitely true.

Hobbies:

1. The average person in Denmark spends around 5 hours a week pursuing a “hobby”.

2. The most popular hobby in the UK for men is playing football.

3. The most popular hobby in the US for women is scuba diving.

4. Around 20% of people in Germany say they have no hobby whatsoever.

5. Using social networking websites (e.g., Twitter, TikTok) is the fastest-growing type of hobby in Europe in the last decade.

Last question: On this scale from 0 to 100, where 0 is 'never' and 100 is 'practically every day', how often do you take part in a hobby?

Work:

1. German people have the longest working hours in Europe.

2. The average number of hours worked by an adult in the UK is 39 per week.

3. More than a quarter of working people in Canada are employed by an internet company.

4. It is illegal to work for more than 44 hours per week in the Netherlands.

Last question: On this scale from 0 to 100, where 0 is 'not at all important' and 100 is 'very important', how personally important is your work/study to you?

Self-accountability:

1. Based on the law of the UK, food producers are more accountable than carriers on food sanitation and quality.

2. More than half of Belgian think drivers are more responsible for car accidents than pedestrians.

3. About eighty per cent of Swiss primary school teachers think they are empowered to attract students' interests during classes.

4. Most Austrians are more likely to be friends with people who behave in moral standards.

5. More than half of Fortune's top 500 companies treat 'taking responsibility' as one of the essential qualities when recruiting new employees.

Last question: On this scale from 0 to 100, where 0 is 'not at all important' and 100 is 'very important', how important is staying tight with your self-standards to you?

Enjoying life:

1. UK people regard food sanitation as the most important basis for enjoying cate.

2. More than half of Belgian people enjoy driving on holidays.

3. About eighty per cent of Swiss primary school teachers believe their students like the classes.

4. Most Austrians are more likely to be friends with people who know how to enjoy leisure time.

5. More than half of Fortune top 500 companies hope their employees can have a good work-life balance.

Last question: On this scale from 0 to 100, where 0 is 'not at all important' and 100 is 'very important', how important is enjoying life to you?

Essay three appendix B: Filler tasks

I. Filler section A (used in studies one, two, three, four, and pre-test for goal priming)

1. What kind of reasons do you typically fly?

A. Business. B. Visiting family/friends. C. Travelling. D. Other reasons.

2. Do you typically purchase your plane tickets directly from an airline, through an online travel discount website (e.g., Expedia, Priceline, etc.), or some other way?

A. Directly from the airline. B. Through an online travel discount website. C. Other ways.

3. Do you participate in an airline rewards/loyal program?

A. Yes. B. No. C. Don't know.

II. Filler section B (used in studies one, two, three, four, and pre-test for goal priming)

1. How many times have you flown in the past 12 months? (Count a return trip as two) (text-entry question).

2. If airlines allow in-flight cell phone usage, would you like to use this service during **"Long haul"** flights?

A. Yes. B. No. C. Not sure.

3. If airlines allow in-flight cell phone usage, would you like to use this service during **"Short haul"** flights?

A. Yes. B. No. C. Not sure.

III. Filler section C (used in study two)

1. Can you recall the airline you fly with last time? (Multiple choice with all major global airlines).

2. To what extent do you find the check-in process smooth and quick for your last flight? (A slider from 0 to 100)

3. When did you last travel with this airline?

A. In the last 1 month. B. Last 2-3 months. C. Last 3-12 months. D. More than 12 months.

Essay three appendix C: Scales and measurements

I. Environmental responsibilization (used in studies one, two, three, and four)

(Scholl et al., 2017). From 1-strongly disagree to 7-strongly agree.

1. When making purchase decisions, I feel partly responsible for the environmental impact of the choices.

2. When making purchase decisions, I sometimes think about how my decisions impact the environment.

3. When making purchase choices, I need to take care of the environment.

4. When making purchase decisions, I am concerned about the environmental impact of the choices.

5. When making purchase choices, I consider how much I can do for the environment

II. Anticipated guilt (used in studies one, two, three, and four)

(Onwezen et al., 2014)

1. If I would **NOT** purchase carbon offsets for the next flight, I would feel: from 1-No guilt at all to 7-A lot of guilt.

2. If I would **NOT** purchase carbon offsets for the next flight, I would feel: from 1-No remorse at all to 7-A lot of remorse.

III. Purchase intent (used in studies one, two, three, and four)

1. How likely would you be to purchase the carbon offset when you buy a flight ticket next time?
From 1- Extremely unlikely to 7- Extremely likely.

2. How inclined would you be to purchase the carbon offset when you buy a flight ticket next time?
From 1- Extremely NOT inclined to 7- Extremely inclined.

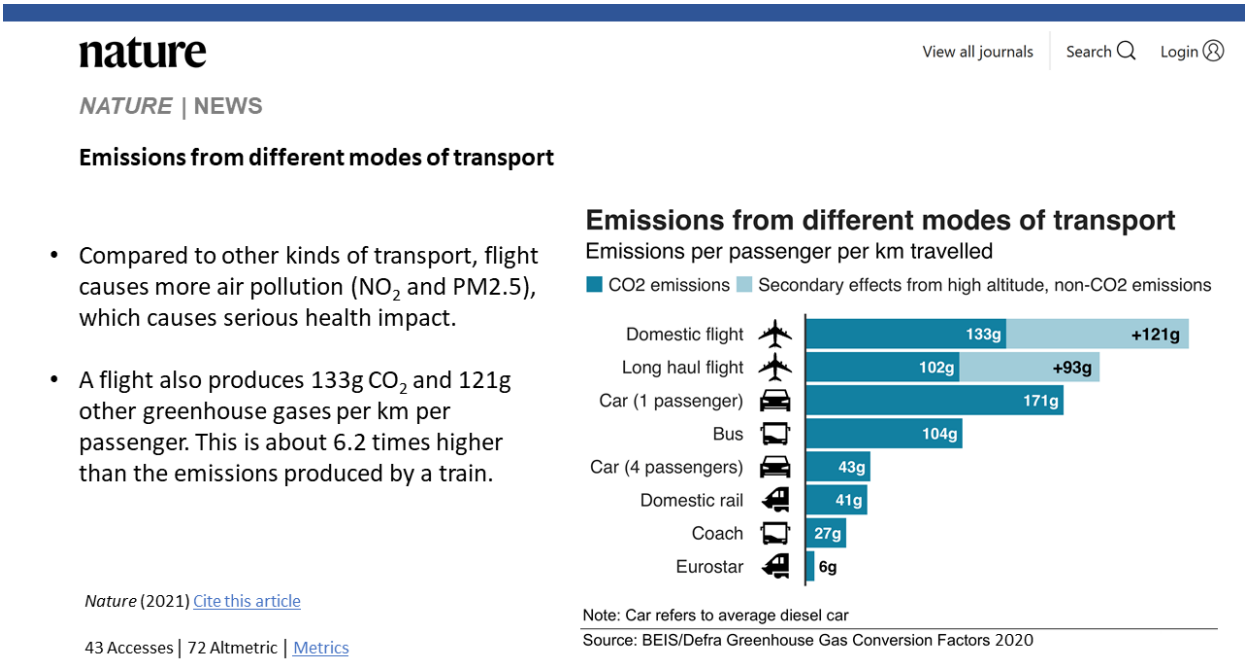
3. How willing would you be to purchase the carbon offset when you buy a flight ticket next time?
From 1- Extremely unwilling to 7- Extremely willing.

Essay three appendix D: Experiment materials

I. Information on the carbon emissions from taking flights (used in studies one, two, three, four, and pre-test for perceived credibility)

Consider the environmental impact of the flight. Study shows that a flight causes more air pollution (such as NO_2 and PM2.5) than other kinds of transport.

A flight also produces 6.2 times higher greenhouse gases than the emissions produced by a train.



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Emissions from different modes of transport

- Compared to other kinds of transport, flight causes more air pollution (NO_2 and PM2.5), which causes serious health impact.
- A flight also produces 133g CO_2 and 121g other greenhouse gases per km per passenger. This is about 6.2 times higher than the emissions produced by a train.

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II. Introduction of a carbon offset project (used in studies one, two, three, four, and pre-test for perceived credibility)

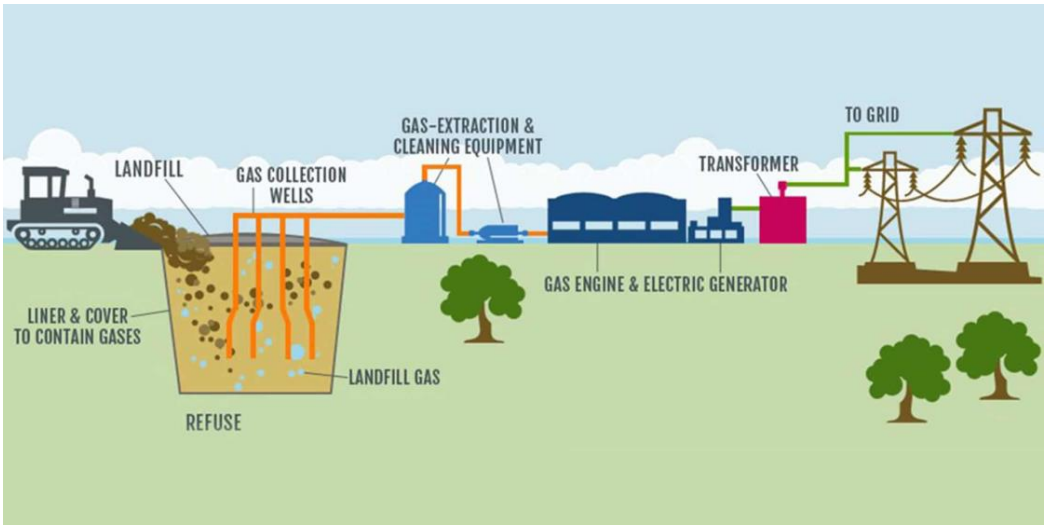
To counteract the high carbon emissions from flying, as some customers notice, airline firms have brought out their Carbon Offsetting Project, and people can choose to pay for the carbon offset when they purchase a flight ticket.

Please see a typical project below:

Carbon Offset Portfolio

Funds collected through our Voluntary Carbon Offset Program will be contributed to the following project :

Eldoret, Rift Valley Region, Kenya: Landfill Gas to Electricity Project



The *Eldoret, Rift Valley Region, Kenya* project is the first landfill gas project in this province or region. It converts methane emissions from landfill waste into electricity, channelling it into the country's national grid. The methane (a potent greenhouse gas) would otherwise escape into the atmosphere, contributing to climate change.

Creating renewable electricity is also helping to reduce Kenya's reliance on fossil fuel-generated electricity, and lower its carbon emissions. The construction of this project is just completed in June 2022 and by calculation, the project will save more than 270,000 tons of carbon dioxide annually.

Benefits

• The project will significantly improve local air quality.

• The project will create global benefits through reduced impact upon climate change.

• The project will also ensure that correct management of the landfill is carried out so as to optimize landfill gas recovery.

• The project creates employment and is helping to develop domestic expertise in landfill gas technology.

• An additional source of revenue from the project's Certified Emissions Reduction credits (CER) will help to secure the future and the continued provision of sanitary waste disposal.

III. Two versions of the introduction of a carbon offset project (used in study four and pre-test for perceived credibility)

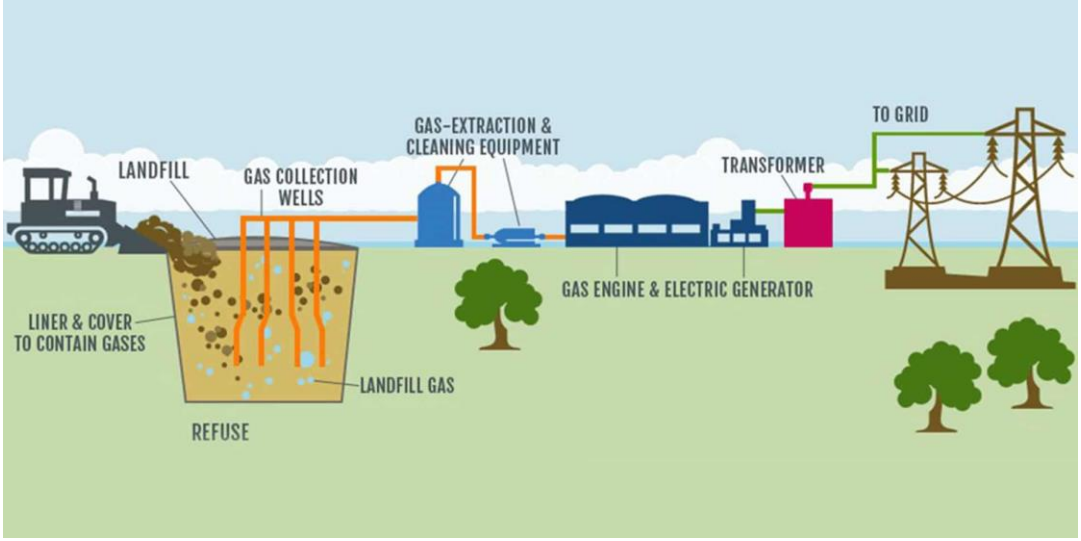
High-credible version: the same as above.

Low-credible version:

Carbon Offset Portfolio

Funds collected through our Voluntary Carbon Offset Program will be contributed to the following project :

Landfill Gas to Electricity Project



The Landfill Gas to Electricity Project converts methane emissions from landfill waste into electricity, channelling it into the country's national grid. The methane (a potent greenhouse gas) would otherwise escape into the atmosphere, contributing to climate change.

IV. Two versions of the poster of "UK Flyer" (used in study three and pre-test for perceived enCSR)

High CSR version:

Control version:

Confirmation of Research Ethics Approval

Research Ethics
Office

Franklin Wilkins Building
5.9 Waterloo Bridge Wing
Waterloo Road
London SE1 9NH
Telephone 020 7848 4020/4076/4077
reo@kcl.ac.uk

KING'S College LONDON

07/02/2022

Jianyu Hao

Dear Jianyu

Consumers' motivated reasoning in airline business

Thank you for submitting your Minimal Risk Self-Registration Form. This letter acknowledges confirmation of your registration; your registration confirmation reference number is MRSP-21/22-28671

Important COVID-19 update: Please consult the latest College guidance (linked below) and ensure you have completed the risk assessment procedure prior to any data collection involving face-to-face participant interactions.

https://internal.kcl.ac.uk/innovation/research/ethics/applications/COVID-19-Update-for-Researchers

Ethical Clearance

Ethical clearance for this project is granted. However, the clearance outlined in the attached letter is contingent on your adherence to the latest College measures when conducting your research. Please do not commence data collection until you have carefully reviewed the update and made any necessary project changes.

Ethical clearance is granted for a period of **three years** from today's date and you may now commence data collection. However, it is important that you have read through the information provided below before commencing data collection:

As the Minimal Risk Registration Process is based on self-registration, your form has not been reviewed by the College Research Ethics Committee. It is therefore your responsibility to ensure that your project adheres to the Minimal Risk Guiding Principles and the agreed protocol does not fall outside of the criteria for Minimal Risk Registration. Your project may be subject to audit by the College Research Ethics Committee and any instances in which the registration process is deemed to have been used inappropriately will be handled as a breach of good practice and investigated accordingly.

Record Keeping:

Please be sure to keep a record of your registration number and include it in any materials associated with this research. It is the responsibility of the researcher to ensure that any other permissions or approvals (i.e. R&D, gatekeepers, etc.) relevant to their research are in place, prior to conducting the research.

In addition, you are expected to keep records of your process of informed consent and the dates and relevant details of research covered by this application. For example, depending on the type of research that you are doing, you might keep:

- A record of all data collected and all mechanisms of disseminated results.
- Documentation of your informed consent process. This may include written information sheets or in cases where it is not appropriate to provide written information, the verbal script,or introductory material provided at the start of an online survey.
  Please note: For projects involving the use of an Information Sheet and Consent Form for recruitment purposes, please ensure that you use the KCL GDPR compliant Information Sheet & Consent Form Templates
- Where appropriate, records of consent, e.g. copies of signed consent forms or emails where participants agree to be interviewed.

Audit:

You may be selected for an audit, to see how researchers are implementing this process. If audited, you and your Supervisor will be asked to attend a short meeting where you will be expected to explain how your research meets the eligibility criteria of the minimal risk process and how the project abides by the general principles of ethical research. In particular, you will be expected to provide a general summary of your review of the possible risks involved in your research, as well as to provide basic research records (as above in Record Keeping) and to describe the process by which participants agreed to participate in your research.

Remember that if you at any point have any questions about the ethical conduct of your research, or believe you may have gained the incorrect level of ethical clearance, please contact your supervisor or the Research Ethics Office.

Data Protection Registration

If you indicated in your minimal risk registration form that personal data would be processed as part of this research project, this letter also confirms that you have also met your requirements for registering this processing activity with King's College London in accordance with the UK General Data Protection Regulation (UK GDPR).

More information about how the UK GDPR affects researchers can be found here: https://internal.kcl.ac.uk/innovation/research/Research-Governance/how-does-uk-data-protection-law-affect-research/how-does-uk-dp-law-affect-research

Please note that any changes to the storage, management, or type of personal data being collected should also be included in a modification request.

We wish you every success with your project moving forward.
With best wishes,

The Research Ethics Office

On behalf of the College Research Ethics Committee

Research Ethics
Office

Franklin Wilkins Building
3.9 Waterloo Bridge Wing
Waterloo Road
London SE19NH
Telephone 020 7848 4020/4076/4077
rec@kcl.ac.uk

KING'S College LONDON

p1/07/2022

Jianyu Hao

Dear Jianyu

Priming self-accountability to encourage the purchase of airline carbon offsets

Thank you for submitting your Minimal Risk Self-Registration Form. This letter acknowledges confirmation of your registration; your registration confirmation reference number is MRSP-21/22-33006

Important COVID-19 update: Please consult the latest College guidance (linked below) and ensure you have completed the risk assessment procedure prior to any data collection involving face-to-face participant interactions.

https://internal.kcl.ac.uk/innovation/governance-ethics-integrity/research-ethics/applications/covid-19-update-for-researchers

Ethical Clearance

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research.

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We wish you every success with your project moving forward.
With best wishes,

The Research Ethics Office

On behalf of the College Research Ethics Committee