



Do Sustainable Cues Lead to Sustainable
Purchasing and Sustainable Delivery Choices?
Testing Goal-framing Theory in a Webshop
Setting

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Abstract

It is crucial that consumers purchase more sustainable products and choose sustainable delivery alternatives as their current behaviour causes climate problems. Recent findings indicate that sustainable packaging cues (e.g. eco-labels and green imagery) can increase sustainable purchase intentions (Ketelsen et al., 2020). Following goal-framing theory (Lindenberg & Steg, 2007), these packaging cues may be effective as they activate the normative goalframe (i.e. focus on complying with social norms). However, it is unknown if sustainable packaging cues remain effective in a realistic setting. Webshop cues such as discounts might decrease activation of the normative goalframe, potentially inhibiting packaging cues' effect. No prior research examined the effect of contextual cues on choosing sustainable delivery options. This study tests the effect of contextual cues in a replicated webshop with a 2 by 2 between-subject experiment: do packaging cues (i.e. sustainable packaging cues versus control) and webshop cues (i.e. normative webshop cues versus hedonic and gain webshop cues (control)) influence i) sustainable purchasing and ii) sustainable delivery intentions, and are these effects mediated through their ability to activate the normative goalframe? Results show that sustainable packaging cues and normative webshop cues increase the amount of money people spend on sustainable products. Interestingly, when combining these cues, people spend slightly less money on sustainable products. I did not find mediation via the normative goalframe pathway and I found no effects for contextual cues on sustainable delivery intentions. Thus, organisations that communicate about sustainability via packaging and webshop cues can help consumers reduce their climate impact.

Keywords: sustainable consumer behaviour, packaging cues, webshop cues.

1. Do Sustainable Cues Lead to Sustainable Purchasing and Sustainable Delivery Choices? Testing Goal-framing Theory in a Webshop Setting

In order to mitigate climate change, it is crucial for society to engage in more pro-environmental action (IPCC, 2018). Changes need to be made in various areas, one of which is consumer behaviour (IPCC, 2018). Current consumer behaviour is on the edge of crossing planetary boundaries, which may result in catastrophic consequences for humanity and ecosystems (Steffen et al., 2018; IPCC, 2018). These consequences include the destabilisation of the baseline temperature (e.g. causing more frequent extreme weather events and sea level rising) due to high amounts of CO₂ emissions (Steffen et al., 2018; IPCC, 2018), and pollution of various environments due to extensive waste (Hoornweg & Bhada-Tata, 2012; Eurostat, 2020; Vaverková, 2019; Ekvall et al., 2021; Schyns & Shaver, 2021). While consumers are increasingly aware of their climate impact, current consumption patterns are still excessive and cause a problem for the environment (Stolz et al., 2013). Consumer behaviour does not seem to change quickly enough to mitigate climate change. Therefore, more insight in when and why consumers choose to engage in sustainable behaviours is crucial (Steg & Vlek, 2009). Previous experiments show that contextual cues, such as sustainable packaging cues, can stimulate sustainable consumer behaviour such as recycling behaviour (Geiger, 2020) and sustainable purchasing intentions (Magnier & Schoormans, 2015; Steenis et al., 2017; 2018). Yet, little studies address if contextual cues can amplify sustainable consumer behaviour in a realistic setting, where contextual (web)shop cues also play a role. Using an experimental design, this study will look into the influence of contextual cues on sustainable consumer behaviour.

1.1 Sustainable consumer behaviour

Consumer behaviour is defined as “the activities and experiences of people that are engaged in buying and disposing of consumer goods and services” (Martin & Schouten,

2012). A sustainable consumer is someone who chooses a sustainable option over a less sustainable alternative in these situations (Finney, 2014).

Consumer choices play a substantial role in the reduction of CO₂ emissions and waste (Prakash et al., 2019). When consumers choose environmentally friendly options, they can drive and promote organisational changes such as the decrease of packaging materials, and the increase of re-usability, recyclability or sustainable delivery options (Rhein & Schmid, 2020; Van den Burg et al., 2021;). Additionally, consumers can decrease their personal negative climate impact directly via sustainable purchases or by choosing sustainable delivery options (Van den Burg et al., 2021; Prakash et al., 2019; Rhein & Schmid, 2020).

1.1.1 Sustainable purchasing

Sustainable purchases can be defined as “the process of purchasing a product that has a reduced negative effect or increased positive effect on the environment, compared to products that serve the same purpose” (Green et al., 1996). One way of sustainable purchasing is by buying sustainably packaged products. Sustainably packaged products use the smallest amount of packaging materials that still ensure the quality of the product. Additionally, the packaging material should be reusable without adding many unused raw materials (Netherlands Institute Sustainable Packaging, n.d.). This form of sustainable purchasing can greatly reduce the climate impact because more than 28% (EPA, 2018) of the approximately 2.2 billion tonnes of waste generated per year consists of packaging materials (Hoornweg & Bhada-Tata, 2012). However, in the Netherlands, only half of all household waste is being reused or recycled (Eurostat, 2022a; 2022b; Stichting Afvalfonds Verpakkingen, 2020). European and worldwide percentages are even lower (Eurostat, 2022a; 2022b; Silpa et al., 2018). This causes environmental problems such as CO₂ emission due to e.g. incineration and transportation of waste, and littered environments (Eurostat, 2020; Vaverková, 2019;

Anshassi et al., 2021; Morris, 2005; Ekvall et al., 2021; Schyns & Shaver, 2021). This illustrates the importance of promoting (the purchase of) sustainable packaged products.

Unfortunately, many consumers lack the knowledge to differentiate between what they think the sustainable option is and what research has found the actual sustainable option to be (Lindh, et al., 2016; Van Dam, 1996; Steenis et al., 2017, Magnier and Crié, 2015). Consequently, consumers rely on packaging cues, such as eco-labels (see paragraph 1.2.1), to derive their opinions on the sustainability of a product.

1.1.2 Sustainable deliveries

Similar to sustainable purchasing, sustainable delivery choices are defined as choosing the option of parcel delivery in a way that has a smaller negative effect or larger positive effect on the environment compared to deliveries that have the same purpose (Green et al., 1996). Consumers increasingly purchase online (PWC, 2022; CBS 2020). For instance, the cosmetic sector has more than doubled within four years (CBS, 2020). Online purchases often have a higher climate impact due to additional packaging materials, transportation, and waste compared to conventional purchases (Sievering, 2020; De Kok, 2020; Pålsson et al., 2017). Given the current trend, it is unlikely that climate goals will be met, which, in turn, increases climate problems (Eurostat, 2020; IPCC, 2022). The last mile delivery is the most impactful mile of the whole delivery process (World Economic Forum, 2020; Bosona, 2020; Lagorio et al., 2016). Consumers can influence the last mile delivery to a large extent (Pålsson et al., 2017; Escursell et al., 2021; Velazques & Chankov, 2019). For example, consumers can let their parcels be delivered to a pick-up point to reduce their negative climate impact (Pålsson et al., 2017; Escursell et al., 2021). Therefore, it is relevant to gain insight in how consumers can be stimulated to pick sustainable delivery options.

This raises the following question: What could motivate consumers to choose more sustainable delivery options? Thus far, no studies have been conducted on the influence of

contextual cues on consumers choices for sustainable delivery options. Considering both the negative environmental impact of deliveries and the influence consumers can have to mitigate the negative impact, it is relevant to study the cues that cause the consumers to make more sustainable choices.

1.2 Contextual cues

Consumers increasingly consider sustainable aspects in their decision process (B-Open, 2020; Unilever, 2017; Van Doorn et al., 2021). Unfortunately, intentions of increased sustainable action often do not result in actions, such as sustainable consumer behaviour (Grimmer & Miles, 2017; Hassan et al., 2016). The context in which consumer behaviour takes place might play a key role in increasing sustainable consumer behaviour (Bouman et al., 2021). Previous studies suggest that contextual cues, such as packaging cues (e.g. eco-labels or natural images), can help consumers focus on sustainability and increase sustainable behaviour (Geiger, 2020; Magnier & Schoormans, 2015; Steenis et al., 2017; 2018). However, limited research is conducted on the influence of contextual cues on sustainable consumer behaviour, while better understanding of underlying processes is needed to help consumers decrease their negative climate impact (Geiger, 2020; Popovic et al., 2019; Ketelsen et al., 2020). In this study, I look at sustainable packaging cues and normative webshop cues.

1.2.1 Packaging cues

Packaging cues are contextual cues that can promote pro-environmental behaviour (Wee et al., 2021; Geiger, 2020). For example, packaging cues that make people focus on the environment can promote recycling behaviour (Geiger, 2020), promote positive consumer responses (Steenis et al., 2017; Van Birgelen et al., 2009), increase intentions to purchase sustainable products (Ketelsen et al., 2020; Magnier & Schoormans, 2015; Steenis et al., 2017; 2018), and influence consumer choices (Rokka & Uusitalo, 2008).

There are different types of packaging cues that can indicate sustainability to consumers. Consumers primarily rely on eco-labels and packaging material and, to a lesser extent, design elements such as colours and nature imagery to evaluate the sustainability of a product (Ketelsen et al., 2020). Eco-labels are explicit cues that provide visual information for consumers on the sustainability of individual products (Granato et al., 2022; Thøgersen et al., 2010). Studies indicate that consumers notice these labels (Bhatt et al., 2021; Ischen et al., 2022) and that their behaviour can be influenced by them (Granato et al., 2022; Herbes et al., 2020; Magnier & Schoormans, 2015). In addition, packaging materials may communicate sustainability as they vary in the way they look, feel or sound (Magnier & Schoormans, 2015; Granato et al., 2022). Sustainable materials, such as biodegradable packaging or recycled plastics, can imitate conventional packaging (Magnier & Schoormans, 2015; Guillard et al., 2018) or highlight their uniqueness to communicate sustainability (Azzi et al., 2012; Rettie & Brewer, 2000; Schoormans & Robben, 1997; Underwood, et al., 2001). Granato et al. (2022) conducted experiments and found that communicating the uniqueness can be effective. In case of a webshop, it is difficult to convey uniqueness in feel and sound. However, visual cues, such as colour and natural imagery, can be displayed in a webshop. Studies show that consumers relate brown and green colours on packaging to sustainability (Magnier & Schoormans, 2015; Pancer et al., 2017). In addition, imagery of leaves can signal sustainability to consumers (Wood et al., 2018; Magnier & Schoormans, 2015). These cues can be misleading as natural colours and imagery often do not reflect actual increased sustainability (Ketelsen et al., 2020; Lindh et al., 2016). Due to their effectiveness, noticeability and the information they provide, I manipulate sustainable packaging in this study with the use of eco-labels and natural coloured leaves (see Figure 4). The effectiveness of sustainable packaging cues is estimated to be affected by the broader webshop context (i.e. webshop cues).

1.2.2 Webshop cues

When purchasing a cosmetic product, consumers are confronted with many other situational factors besides packaging cues (i.e. webshop cues). Similar to packaging cues, they might stimulate or inhibit sustainable consumer behaviour. Previous studies mostly used surveys (Magnier & Schoormans, 2015; Steenis et al., 2017; 2018) to study the influence of packaging cues on consumer behaviour and no studies could be located that measured actual purchasing. Consequently, it is unknown if packaging cues are strong enough to increase sustainable consumer behaviour in realistic setting, such as a replicated webshop, where people are simultaneously exposed to many webshop cues that might work conflicting (Ketelsen et al., 2020). Webshops contain cues such as discounts or mentioning of fast delivery. These webshop cues might stimulate consumers to pick non-sustainable product and delivery options. When a webshop would contain sustainable signals such as labels that indicate sustainability, this can potentially increase sustainable consumer behaviour.

In this study I will examine whether webshop cues can motivate consumers to purchase more sustainable products (i.e. products with sustainable packaging cues) and choose more sustainable delivery options when purchasing products online. In addition, I will address the underlying process of why these contextual cues might be effective.

1.3 Mechanism underlying sustainable consumer behaviour: the normative goalframe

Personal goals play an important role in sustainable consumer behaviour (Gatersleben et al., 2014). Goal-framing theory (Lindenberg & Steg, 2007) poses that people can strive for three goals in a given situation: i) the hedonic goalframe which focuses on increasing or maintaining pleasure and comfort, ii) the gain goalframe which focuses on maintaining or increasing personal belongings or status and iii) the normative goalframe which focusses on complying with the social norms and rules. Every person endorses each of these three goals. However, it depends on the context which goal is most dominant (i.e., the 'goalframe'),

because the context can change an individual's focus, making different information available. An individual's decisions are based on the dominant goalframe while other goals are still active in the background. Background goals can strengthen (when in line with the goalframe) or inhibit (when conflicting with the goalframe) the dominant goal and, thereby, pro-environmental behaviour (Lindenberg & Steg, 2007). Activation of the normative goalframe has been shown to consistently lead to more sustainable (consumer) behaviour compared to the other goalframes (Lindenberg & Steg, 2007; Steg et al., 2014), as sustainable behaviour is considered a moral behaviour (Turaga et al., 2010). However, this goal needs the most external support to make it salient (Lindenberg & Steg, 2007). There are two ways to make the normative goalframe more salient: i) reducing the conflict of the normative goalframe with the hedonic/gain background goal or ii) strengthening the normative goal (Steg et al., 2014).

First, reducing the conflict between the goals can be achieved by making sustainable behaviour more enjoyable and cheaper or unsustainable behaviour less enjoyable and more expensive. However, this might strengthen hedonic and gain goals and decrease the strength of the normative goal. This can lead to the inhibition of long-term sustainable consumer behaviour because individuals learn that sustainable consumer behaviour needs to be fun and cheap rather than intrinsically rewarding (Steg et al., 2014; Thøgersen & Crompton, 2009; De Groot & Steg, 2009). Second, the preferred way is to increase sustainable consumer behaviour by strengthening the normative goal. This can increase sustainable consumer behaviour directly and can increase the change of future sustainable consumer behaviour as well (Van der Werff et al., 2013; Evans et al., 2013; Bénabou & Tirole, 2006; Bolderdijk et al., 2013). The strength of the normative goal can be increased by situational factors such as packaging cues and webshop cues (Steg et al., 2014; Geiger et al., 2020).

1.4 Research questions

This study aims to answer the question: what is the influence of context (i.e. packaging design and the broader webshop context) on sustainable consumer behaviour (e.g. sustainable purchasing (DV1) and sustainable delivery intentions (DV2)) in a webshop and what is the underlying process? I will study the effect on purchasing behaviour and delivery intentions by conducting a 2 by 2 experiment. The experiment entails using a replicated webshop of an anonymised cosmetic store and manipulating the packaging design (i.e. packaging cues) and the broader shop context (i.e. webshop cues). Formally:

1.4.1 Research question 1: Do contextual cues influence sustainable purchases?

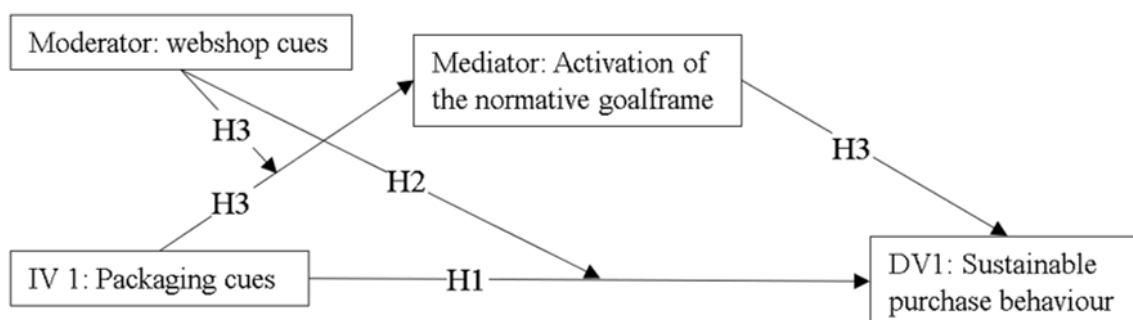
H1: The presence of sustainable packaging cues increases the amount of money people spend on products that receive these packaging cues.

H2: Sustainable packaging cues will have a stronger positive effect on sustainable purchasing when normative cues are present in a webshop.

H3: The effects of sustainable packaging cues on sustainable purchasing (H1) and the mediation effect between normative webshop cues and sustainable packaging cues (H2) on sustainable purchasing are mediated by activation of the normative goalframe (see Figure 1 for the conceptual framework of RQ1).

Figure 1

Conceptual framework of Research Question 1



1.4.2 Research question 2: Do contextual cues influence sustainable delivery intentions?

For sustainable purchasing we I hypothesised solely a direct effect of sustainable packaging cues. The direct effect of normative webshop cues is not hypothesized because I

solely measure the amount of money people spend on products that receive sustainable packaging cues. Therefore, I assume normative webshop cues enhance the effect of packaging cues on sustainable purchasing. In contrast, for sustainable delivery options I assume both sustainable packaging cues and normative webshop cues can have a direct effect. Therefore, normative webshop cues function as an independent variable instead of solely a moderator in the hypothesise of sustainable delivery options. Formally:

H4: The presence of sustainable packaging cues increases people's sustainable delivery intentions.

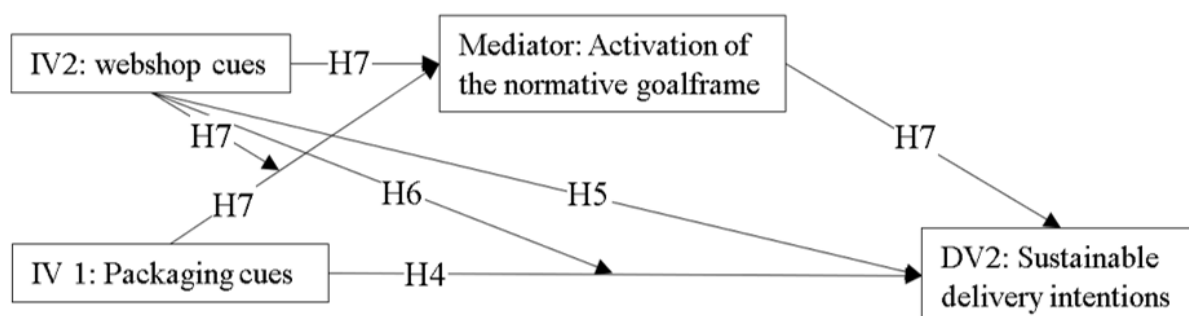
H5: The presence of normative webshop cues increases people's sustainable delivery intentions.

H6: Sustainable packaging cues will have a stronger positive effect on sustainable delivery intentions when normative cues are present in a webshop.

H7: The effects of sustainable packaging cues (H4), normative webshop cues (H5) and their interaction on sustainable delivery intentions (H6) are mediated by activation of the normative goalframe (see Figure 2 for the conceptual framework of RQ2).

Figure 2

Conceptual framework of Research Question 2



2. Method

This study was conducted in the context of a master thesis. This study received approval of the ethical committee of the University of Groningen and was pre-registered at https://aspredicted.org/JQY_CW8.

The initial research question came from the Netherlands Institute for Sustainable Packaging (KIDV). The KIDV is an independent research and advisory body, subsidised by the Packaging Waste Fund. The KIDV intended this study to be realistic and have direct practical implications. Therefore, I collaborated with an existing cosmetic store chain that is anonymised within this study.

The cosmetic store consists of a webshop and conventional stores located throughout the Netherlands. For this study, a replica of their webshop was created. Although the research was conducted independently from the webshop, employees of the store did provide information on products, pricing, and their online store functionalities.

2.1 Sample

The study included $N = 300$ participants, recruited between 10 to 20 June 2022. Participants needed to be at least 16 years old (due to parental consent) and needed to have a sufficient command of the Dutch language. Of the participants $N = 179$ (61,1%) were female and $N = 108$ (36,9 %) were male and $N = 6$ (2.1%) other. Participants' age was between 16 and 75 years old with an average age of $M = 32.3$ ($SD = 12.87$) (see Table 1 for other demographics).

Participants were recruited via a convenience sample in three ways: i) the panel Prolific ($N = 170$), ii) the webshop's newsletter ($N = 62$), and ii) social media ($N = 68$). A one-way ANOVA indicated that the newsletter group ($M = 26.93$, $SD = 5.00$) had a significantly higher normative goalframe than the Prolific group ($M = 24.05$, $SD = 5.78$, $p = 0.002$, $F(2,290) = 7.06$, $\eta^2 = 0.05$). No other significant between-group differences were found on other variables (see Table 1 for an overview of the demographics per sample group).

Due to a failed attention check, $N = 7$ participants were excluded. Of the remaining participants $N = 5$ had an outlying value ($SD > 3$ from the mean): $N = 3$ for purchasing

behaviour and $N = 2$ for the normative goalframe. Hence, separate main analyses with ($N = 293$) and without outliers ($N = 288$) were conducted.

An a-priori power analysis using G*Power indicated that the analysis required $N = 279$ participants for $f^2 = 0.05$, power ($1 - \beta =$) 0.8 , $\alpha = .05$ and 6 predictors (the official power analysis was out of the scope of this master thesis. The post-hoc power analysis indicated the study was underpowered ($1 - \beta = 0.58$).

Table 1

Demographics: sex, nationality, educational level and previous purchases at store

Baseline characteristics	Full sample ($N = 293$)		Prolific ($N = 170$)		Social media ($N = 68$)		Newsletter ($N = 62$)	
	N	%	N	%	N	%	N	%
Sex								
Female	179	61.1%	84	48.2%	46	73%	51	85.0%
Male	108	36.9%	82	49.4%	17	27%	7	11.7%
Other	6	2.1%	4	1.2%	-	0%	2	3.3%
Nationality								
Dutch	227	77.5%	111	65.3%	60	95.2%	56	93.3%
Belgium	51	17.4%	49	28.8%	1	31.2%	1	1.7%
Other	15	5.1%	10	5.9%	2	1.6%	3	5.0%
Educational level								
University	112	38.2%	74	43.5%	23	36.5%	15	25%
HBO*	90	30.7%	38	22.4%	26	41.3%	26	43.3%
MBO**	31	10.6%	10	5.9%	7	11.1%	14	23.3%
Middle school	57	19.5%	46	27.1%	7	11.1%	4	6.7%
Primary school	3	1.0%	2	1.2%	-	0%	1	1.7%
Previous purchasing at store								
Conventional	108	36.9%	64	37.6%	27	42.9%	17	28.3%
Both	95	32.4%	36	21.2%	19	30.2%	40	66.7%
Neither	85	29.0%	67	39.4%	17	27.0%	1	1.7%
Online	5	1.7%	3	1.8%	-	0%	2	3.3%

Note. Demographics per for the full sample $N = 293$ and per subgroup (i.e. recruited via prolific, social media and the newsletter). * HBO = Higher Vocational Education and ** MBO = Intermediate Vocational Education.

2.2 Procedure

The questionnaire was administered online, using Qualtrics. The participants were directed to the first questionnaire either through the webshop's newsletter, a social media

post, or the Prolific platform. After giving their informed consent, participants were directed to the replicated webshop and automatically randomly assigned to one of the four experimental conditions of the webshop (see figure 3 for an overview of the four conditions).

In the webshop, participants viewed a selection of twenty generic brand products of the cosmetic store (that is anonymised within this thesis) from which they could choose. All products were cosmetic products except two teas. Participants were told they could win the products they selected, as well as the left-over money in vouchers to encourage realistic purchasing. In the debriefing, participants learned that they could not win the selected products but instead the full €50 in vouchers. Participants were instructed via a grocery list they had to i) select at least one of the two teas, ii) spend a minimum of €20 and iii) spend a maximum of €50. Participants were required to pick whether or not they wanted to ship their parcel in sustainable, reusable, and resendable packaging with an additional deposit of €4.95. If all requirements were met, participants were able to click on ‘purchase and continue to survey’. They were then automatically redirected to the second questionnaire in Qualtrics.

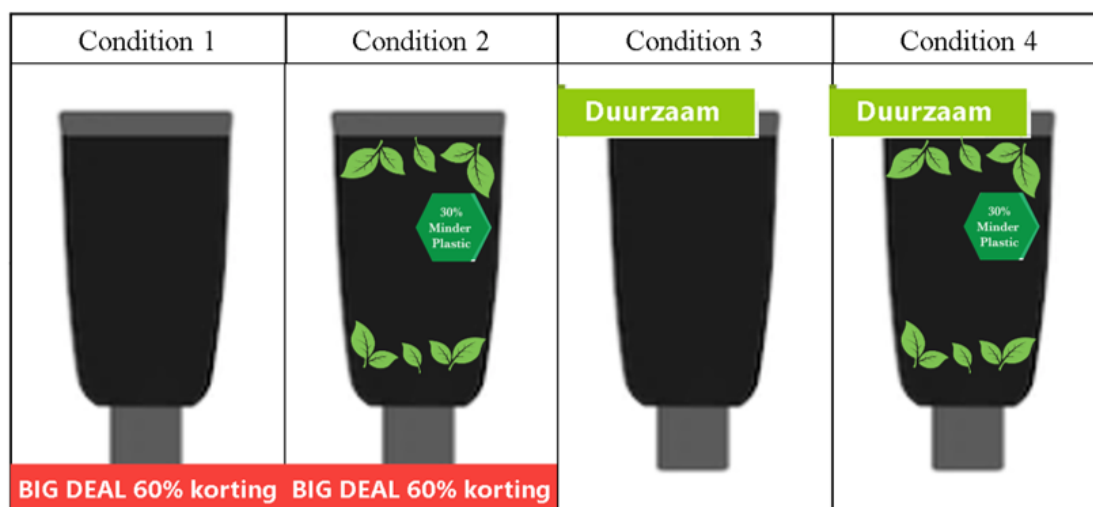
The second part of the questionnaire consisted of questions about manipulation checks, activation of the normative goalframe, demographics, sustainable delivery intention, and filler questions. Finally, participants were debriefed on the purpose of the study and the fact that they could only win €50 if they choose to submit their email address.

2.3 Materials

This experiment had a 2 by 2 between subjects’ design, consisting of three experimental conditions and one control condition. Each participant was randomly assigned to either the activation or non-activation condition of sustainable packaging cues *and* the activation or non-activation of normative webshop cues (see Figure 3 for an overview of the four conditions). This experiment consisted of the most realistic, but simplified, replica of the collaboration partner’s webshop (see Appendix D for functionalities of webshop).

Figure 3

An overview of the four experimental conditions.



Note. Figure 1 shows an overview of the four conditions of the 2 by 2 experiment. Condition 1 is the control condition with hedonic and gain webshop cues and no packaging cues. Condition 2 contains solely sustainable packaging cues. Condition 3 contains normative webshop cues. Condition four contains both sustainable packaging and normative webshop

2.3.1 Manipulation

The replicated webshop displayed twenty products of the cosmetics stores generic brand. As part of the manipulation, participants were randomly exposed to products with or without sustainable packaging cues, and a webshop with a hedonic/gain or normative context.








Fourteen of the twenty products were manipulated to create either a hedonic/gain or normative context. These fourteen products consisted of seven pairs of similar products (i.e. two toothpastes, shampoos, essential oils, body oils, teas, soaps, and sunscreens). Of each pair, one was manipulated in the activation condition of sustainable packaging and the other was not. The pairs of products were selected to be similar in purpose and popularity, but to vary in similarity of look and price. This aimed to create a realistic webshop where consumers could pick between similar products. There is one exception where both products of a pair tea products were manipulated in the experimental condition of packaging cues. The reason for this was twofold. First, it ensured that participants selected at least one manipulated product. Second, it reminded participants of the packaging and webshop cues once they reached the

shopping basket. Participants received a shopping list and were obliged to purchase at least one of the two teas. Besides that, participants could pick the products they purchased freely. The six leftover products never received packaging or webshop cues and functioned as filler products to create a realistic webshop setting (i.e. body butter, bath salt, face mask, face serum, vitamin B12 and vitamin D).

In sum, the webshop consisted of twenty products, fourteen products received a webshop cue (i.e. hedonic/gain or normative) and eight of the fourteen products received a packaging cue in the activation condition of sustainable packaging (see Figure 4 for an overview). The following two paragraphs explain both manipulations in depth. The manipulations are tested with a pilot study ($N = 27$).

Figure 4

Overview of number of products that receive specific cues for each condition

Conditions	Hedonic and gain webshop cues (control)	Sustainable packaging cues	Normative webshop cues	Normative webshop and sustainable packaging cues	Filler products (no cues)
					
					
Condition 1	14	-	-	-	6
Condition 2	6	8	-	-	6
Condition 3	-	-	14	-	6
Condition 4	-	-	6	8	6

Note. Condition 1 is the control condition with hedonic and gain webshop cues and no packaging cues. Condition 2 contains sustainable packaging cues. Condition 3 contains normative webshop cues. Condition 4 contains both sustainable packaging cues and normative webshop cues.

Normative webshop cues. To activate either a normative or the hedonic and gain goalframe, the webshop context was manipulated. In the non-experimental condition of the webshop (i.e. the hedonic and gain cues condition) I assumed the webshop already contained

hedonic and gain cues. The hedonic and gain cues the webshop contained were the mentioning of free delivery, fast delivery and depicted labels in red labels which showed a discount between 50% and 70% of the price for fourteen products. This is similar to the original webshop. The six filler products' prices were also discounted from the original price but did not receive the discount label. This was to prevent people from spending their entire budget on one or two filler products. Simultaneously, this created a realistic webshop setting where not all products receive discount labels.

In the activation condition of the normative webshop, the aforementioned hedonic and gain cues were absent, while the fourteen discount labels were replaced by sustainability labels. Again, the six filler products did not receive a label. The prices of the products stayed equal to the discount condition. Figure 5 shows the different webshop cues.

Figure 5

Manipulation webshop: Normative versus gain and hedonic webshop cues.

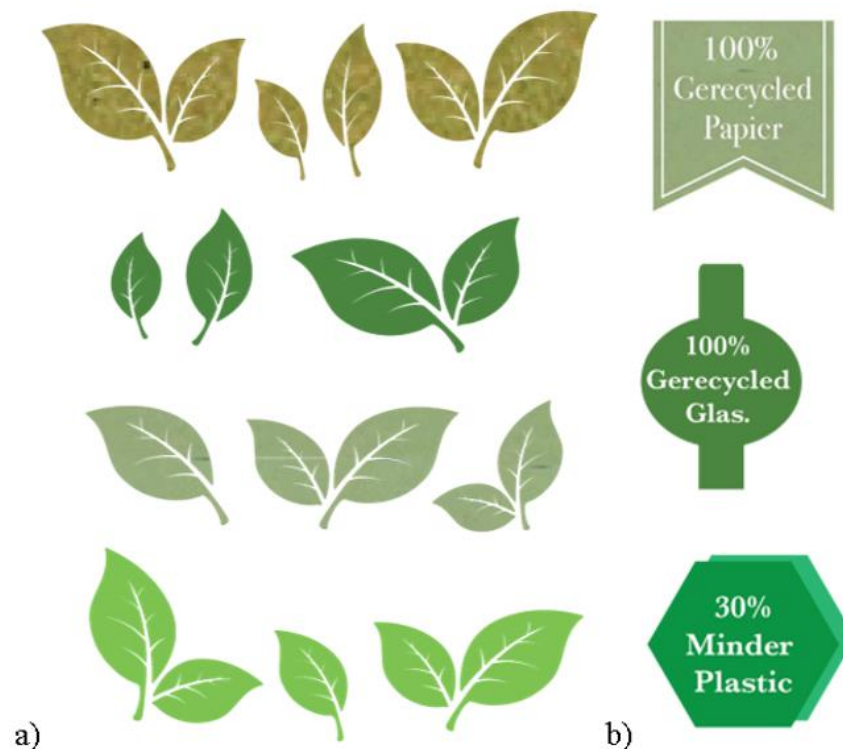


Note. This figure contains: a) the labels used for products in the normative webshop stating “Sustainable” in Dutch and b) the labels used for products in the hedonic/gain webshop stating “BIG DEAL 60% discount” in Dutch.

Sustainable packaging cues. In the experimental condition of sustainable packaging cues, eight of the fourteen products that received a webshop cue, receive a packaging cue. The manipulated products received an eco-label and natural elements (i.e. leaves). These manipulations slightly differ per product to match the packaging of the product (Figure 6 for sustainable packaging manipulations). In the non-experimental condition, no products were manipulated.

Figure 6

Manipulations of sustainable packaging: natural elements and eco-labels.



Note. This figure contains the two aspects of the manipulation of sustainable packaging design. a) the natural elements (leaves) in four possible tints of green. Different colours of green are used to ensure the manipulation for different packaging is realistic. b) the eco-labels for paper, glass and plastic products. Depending on the main component of the packaging material, the manipulation consists of a sustainability claim on the main material.

2.3.2 Measures

This paragraph describes each of the measures used within this study (See Appendix A for the full questionnaire).

Manipulation checks. Participants filled out three manipulation check items (e.g. “I saw that the overview page of the webshop contained discount labels (e.g. 60% discount)”) masked by 6 filler items (e.g. “the product information was clear”).

Activation of the normative goalframe. To measure the activation of the normative goalframe, I translated the scale by Tang et al. (2019) (Cronbach’s $\alpha = .861$). This scale consisted of six items. Five items pertained to the normative goalframe (e.g. “I feel morally obliged to engage in green consumption”) and one item was an attention check (e.g. “Answer

this question with ‘strongly agree’”). All six questions used a 7-point Likert scale ranging from “strongly disagree” to “strongly agree”.

Sustainable purchasing. Sustainable purchasing was measured within the replicated webshop as the amount of money (up to €50) participants spent on the manipulated products in the experimental condition of sustainable packaging.

Sustainable delivery intention. Sustainable delivery intention was measured via a scale (i.e. SDI-scale) designed for this study. The scale originally consisted of eleven items and was based on a literature on impactful sustainable delivery behaviours (see Appendix B for background literature for sustainable delivery intention scale). This scale was pre-tested through an experts’ pilot ($N = 6$), a test takers’ pilot with use of the read-aloud protocol ($N = 6$), and a raters’ pilot ($N = 17$). Minor adjustments were made.

To ensure the scale functioned properly, an exploratory factor analysis was conducted. A factor analysis with Direct Oblimin rotation was conducted since two factors had an Eigenvalue > 1 . Variables with a component loading $< .55$ were excluded from the scale (see Appendix C for factor analysis and scale construction).

The final SDI-scale was the sum score of seven items (e.g. “If I have the option, I will choose a sustainable mode of transportation for the delivery of my next parcel.”), answered on a seven-point Likert scale going from “strongly disagree” to “strongly agree”. The SDI-Scale consisted of one factor and had a good internal reliability (Cronbach’s $\alpha = .861$). The convergent validity of the scale was moderate to strong ($r = .471$) with sustainable delivery behaviour (i.e. measured by the in-webshop option for a reusable delivery packaging).

2.3.3 Analysis plan

Two analyses for each outcome variable were conducted (i.e. DV1: ‘sustainable purchasing’ (H1 – H3) and DV2: ‘sustainable delivery intention’(H4-H7)). I tested moderated mediation, that included activation of the normative goalframe as mediator, for both analyses

using PROCESS plugin version 4.0 model 8 (Hayes, 2022) in SPSS version 27. These analyses included bootstrapping to ensure normality and homoscedasticity. In addition, the anonymised cosmetic store was interested in the total amount of money participants spent in the four different conditions. A two-way ANOVA compared the total amount of money spent between conditions.

3. Results

3.1 Descriptive statistics

The means, standard deviations and Pearson correlations for the main variables are provided in Table 2. The means and standard deviations of the four conditions within this study can be found in Table 3.

Table 2

Means, standard deviations, and zero-order correlations for the main variables.

Variables	<i>M</i>	<i>SD</i>	1	2	3	4
Sustainable packaging cues	0.52	0.50				
Normative webshop cues	0.50	0.50	-.051			
Normative goalframe	25.04	5.64	.002	.010		
Sustainable purchases	13.51	7.92	.049	.085	.006	
Sustainable delivery intention	29.75	9.24	.052	.023	.619***	-.025

Note. $N = 293$. *** indicates $p < .01$ (2-tailed).

Table 3

Means and standard deviations for the main variables per condition.

Variables	Control group. (Gain and hedonic webshop cues) ($N = 67$).		Experimental group I. packaging cues ($N = 79$).		Experimental group II. normative webshop cues ($N = 75$).		Experiment group III. packaging cues + normative webshop cues ($N = 72$).	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Normative goalframe	24.40	6.01	25.48	5.31	25.59	5.68	24.58	5.61
Sustainable purchasing	11.13	7.21	14.29	8.07	14.88	8.81	13.44	7.02
Sustainable delivery intention	28.42	9.28	30.48	8.89	30.00	8.91	29.93	9.95

In this study, packaging cues and webshop cues were manipulated. T-tests showed that participants noticed whether i) sustainable packaging cues ($t(291) = -2.26, p < .035, d = .482$),

ii) normative webshop cues ($t(291) = -10.50, p < .000, d = .420$), and iii) hedonic and gain webshop cues ($t(291) = 22.97, p < .000, d = .296$) were present.

3.2 Main analysis

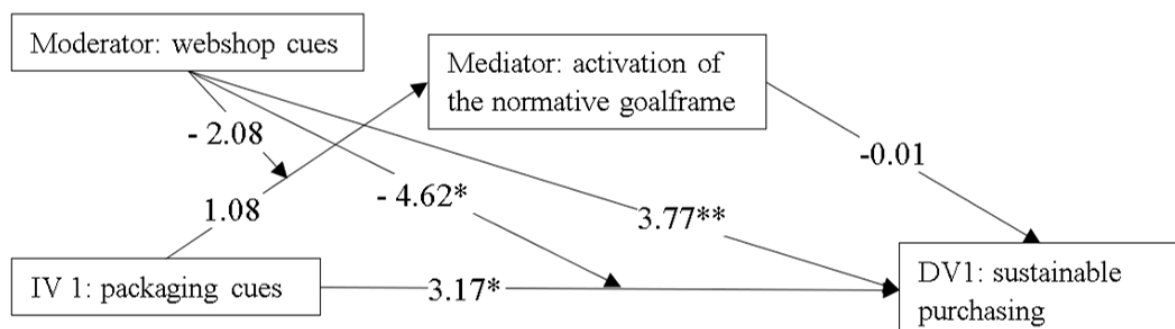
To investigate the research question: “what is the influence of context (i.e. packaging design and the broader webshop context) on sustainable purchasing (DV1) and sustainable delivery intentions (DV2) in a web-shop and what is the underlying process?”, two separate moderated mediation analyses were performed using PROCESS (model 8) in SPSS. No assumptions of independence of the sample, linearity, normality and homoscedasticity were violated. Both analyses are separately discussed below.

3.2.1 Sustainable purchasing

In the first analysis the outcome variable was sustainable purchasing. The predictor variable was packaging cues. The moderator was webshop cues and the mediator was activation of the normative goalframe (see Figure 7 for the conceptual model with b coefficients, Table 4 for the moderated mediation analysis and Figure 8 bar charts of the effects).

Figure 7

Conceptual model of sustainable purchasing with regression coefficients



Note. *indicates $p < .05$. ** indicates $p < .01$.

Table 4*Moderated mediation analysis on sustainable purchasing*

Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	95% bootstrap interval
Step 1: Main effect of normative goalframe (moderated mediation analysis)					
Packaging cues	1.08	0.94	1.15	.252	-0.77, 2.92
Webshop cues	1.18	0.95	1.25	.213	-0.69, 3.05
Packaging X webshop cues	-2.08	1.32	-1.57	.117	-4.68, 0.52
Step 2: Main effect of sustainable purchasing (moderated mediation analysis)					
Packaging cues	3.17	1.31	2.42	.016*	0.60, 5.74
Webshop cues	3.77	1.32	2.84	.005**	1.16, 6.37
Packaging X webshop cues	-4.62	1.85	-2.50	.013*	-8.26, -0.99
Normative goalframe	-0.01	0.08	-0.14	.886	-0.17, 0.15

Note. *indicates $p < .05$. ** indicates $p < .01$. Model: 8. Y: sustainable purchasing, X: Packaging cues, M: Normative goalframe and W: Webshop cues. $N = 293$. The model summary statistics of step 1: $R^2 = .009$, $MSE = 31.91$, $F(3, 289) = 0.84$, $p = .475$ and the model summary statistics of step 2 $R^2 = .031$, $MSE = 61.67$, $F(4, 288) = 2.31$, $p = .058$. The table stops at step 2 since none of the main effects were mediated via activation of the normative goalframe. Similar results were found in the analysis that did not include outliers.

Direct effect of packaging cues (H1). In line with hypothesis 1, sustainable packaging cues significantly increased the purchase of sustainable products ($b = 3.17$, $t(292) = 2.43$, $p = .016$). Consumers that encountered sustainable packaging cues ($M = 14.29$, $SD = 8.07$) spent €3.17 (95% CI [0.60, 5.74]) more on average on sustainable products than participants that did not encounter these cues ($M = 11.13$, $SD = 7.21$).

Direct effect of webshop cues (Post-hoc hypothesis). I identified a significant effect that was not hypothesized a-priori (see 1.4.2 for reasoning). Namely, normative webshop cues significantly increased the purchase of sustainable products ($b = 3.77$, $t(292) = 2.85$, $p = .005$). On average, participants spent €3.77 more on sustainable products (95% CI: [1.16, 6.37]) in the normative webshop cues condition ($M = 14.88$, $SD = 8.81$) than in the gain and hedonic webshop cues condition ($M = 11.13$, $SD = 7.21$).

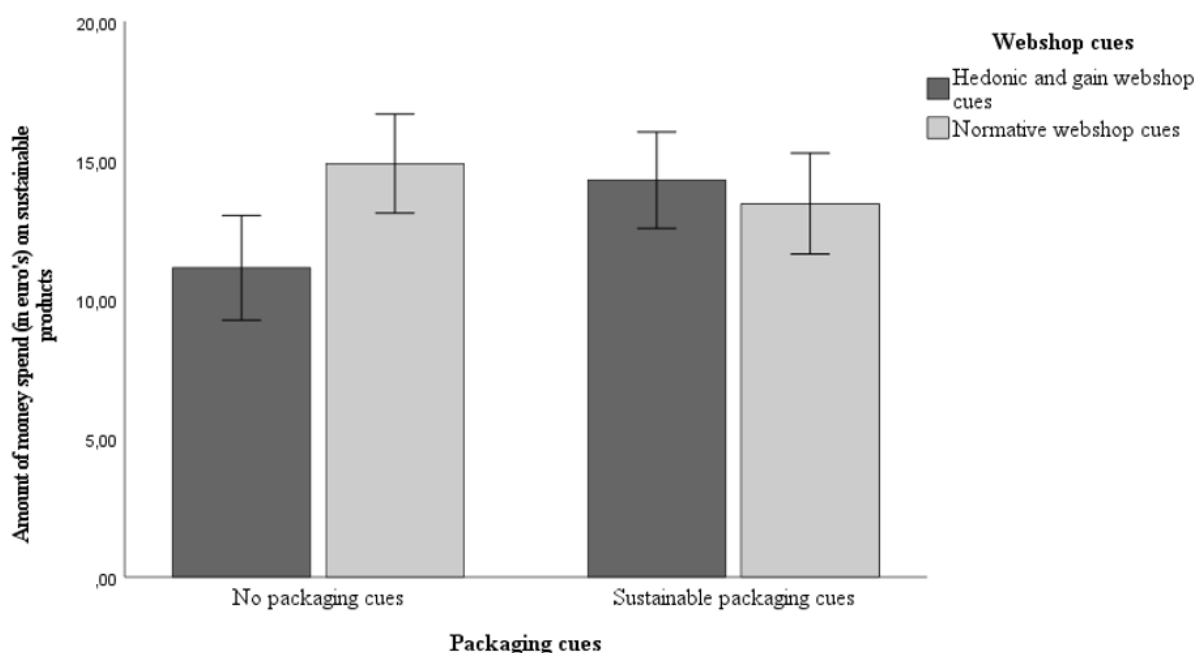
Moderation effect of webshop cues on the relation between packaging cues and sustainable purchasing (H2). The effect of sustainable packaging cues was moderated by normative webshop cues ($b = -4.62$, $t(292) = -2.50$, $p = .01$). In contrast to hypothesis 2, the combination of packaging and webshop cues had a negative effect. When no sustainable

packaging cues were present, normative webshop cues had a positive influence on sustainable purchasing. Conversely, when sustainable packaging cues were present, it did not matter whether normative webshop cues were present or not.

Mediation by normative goalframe (H3). In contrast to hypothesis 3, the effect of sustainable packaging cues ($t(292) = 1.15, p = 0.252$), normative webshop cues ($t(292) = 1.25, p = 0.213$) and their interaction ($t(292) = -1.57, p = 0.117$) did not lead to a higher activation of the normative goalframe. Moreover, a higher activation of the normative goalframe did not significantly increase sustainable purchasing ($t(292) = -0.14, p = .886$). Therefore, the mediation (H3) is not supported.

Figure 8

Estimated amount of money spent on sustainable products per condition



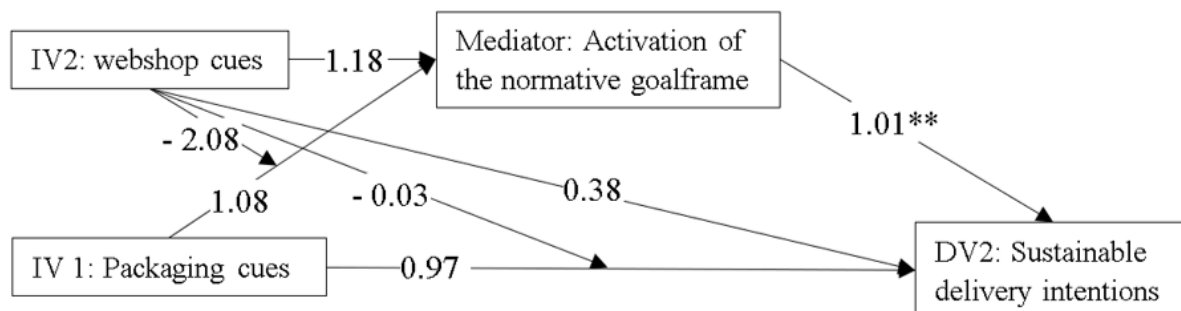
Note. Error bars represent 95% confidence intervals.

3.2.2 Sustainable delivery intentions

In the second analysis, I tested the effect of the same two types of cues on sustainable delivery intentions. Again, I tested whether this effect was mediated by activation of the normative goalframe. See Figure 9 for the conceptual model with b coefficients, Table 5 for the moderated mediation analysis and Figure 10 for bar charts of the effects)

Figure 9

Conceptual model of sustainable delivery intentions with regression coefficients



Note. *indicates $p < .05$. ** indicates $p < .01$.

Table 5

Moderated mediation analysis sustainable delivery intentions

Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	95% bootstrap interval
Step 1: Main effect of normative goalframe					
Packaging cues	1.08	0.69	1.15	.251	-0.76, 2.93
Webshop cues	1.18	0.94	1.25	.214	-0.69, 2.05
Packaging X webshop cues	-2.08	0.95	-1.57	.117	-4.68, 0.52
Step 2: Main effect of sustainable purchasing					
Packaging cues	0.97	1.21	0.80	.424	-1.42, 3.36
Webshop cues	0.38	1.23	0.31	.755	-2.03, 2.80
Packaging X webshop cues	-0.03	1.71	-0.02	.988	-3.40, 3.35
Normative goalframe	1.01	0.08	13.34	.000**	0.86, 1.16

Note. *indicates $p < .05$. ** indicates $p < .01$. Model: 8. Y: sustainable delivery intentions, X: Packaging cues M: Normative goalframe and W: Webshop cues. $N = 293$. The model summary statistics of step 1: $R^2 = .009$, $MSE = 31.91$, $F(3,289) = 0.84$, $p = .475$ and the model summary statistics of step 2 $R^2 = .386$, $MSE = 53.11$, $F(4,288) = 45.27$, $p = .000$. The table stops at step 2 since none of the main effects were mediated via activation of the normative goalframe. Similar results were found in the same analysis that did not include outliers.

Direct effect of sustainable packaging cues (H4). Contrary to hypothesis 4, no significant effect of sustainable packaging cues was found on sustainable delivery intentions ($t(292) = 0.80$, $p = .424$).

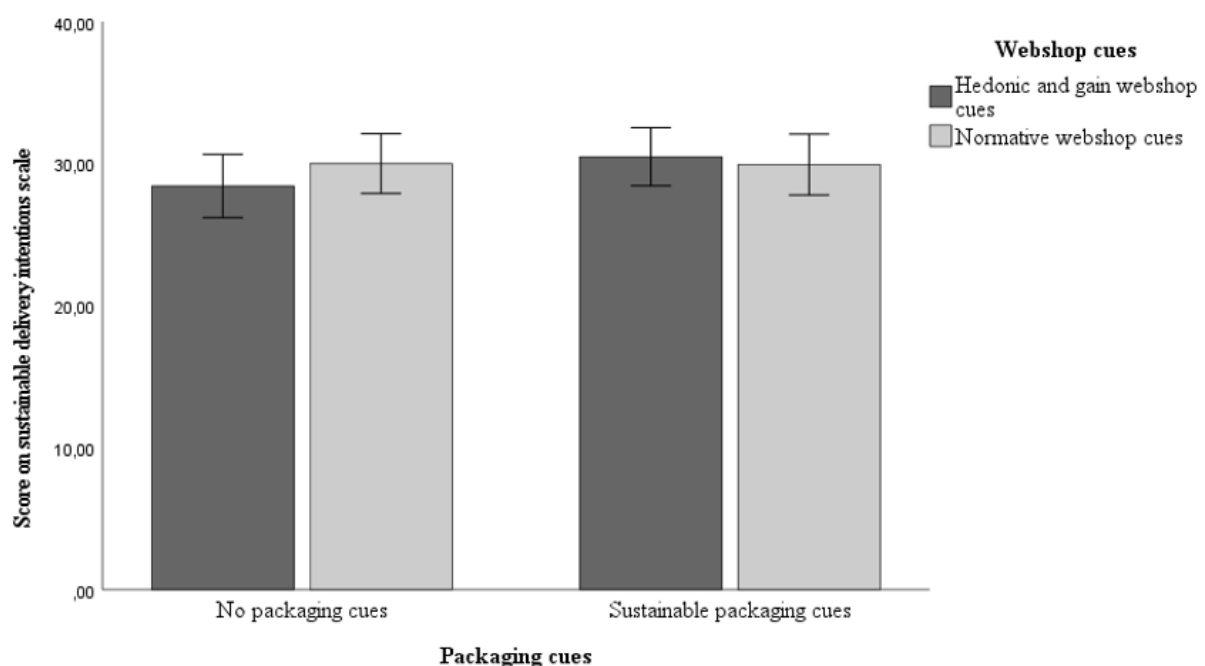
Direct effect of sustainable packaging cues (H5). Normative webshop cues did not increase sustainable delivery intentions ($t(292) = 0.31$, $p = .755$). Therefore, I reject hypothesis 5.

Moderation effect between webshop cues and packaging cues (H6). In contrast to hypothesis 6, no evidence for moderation between packaging cues and webshop cues was found ($t(292) = -0.02, p = .988$).

Mediation by normative goalframe (H7). Activation of the normative goalframe correlated significantly with a higher sustainable delivery intention ($t(292) = 13.34, p = .000, b = 1.01$). Participants with higher activations of the normative goalframe had slightly increased sustainable delivery intentions. However, no significant effects were found of sustainable packaging cues ($t(292) = 1.15, p = .251$), normative webshop cues ($t(292) = 1.47, p = .214$) and their interaction ($t(292) = -1.57, p = .117$) on activation of the normative goalframe, rejecting hypothesis 7.

Figure 10

Average sustainable delivery intention score per condition.



Note. Error bars represent 95% confidence intervals.

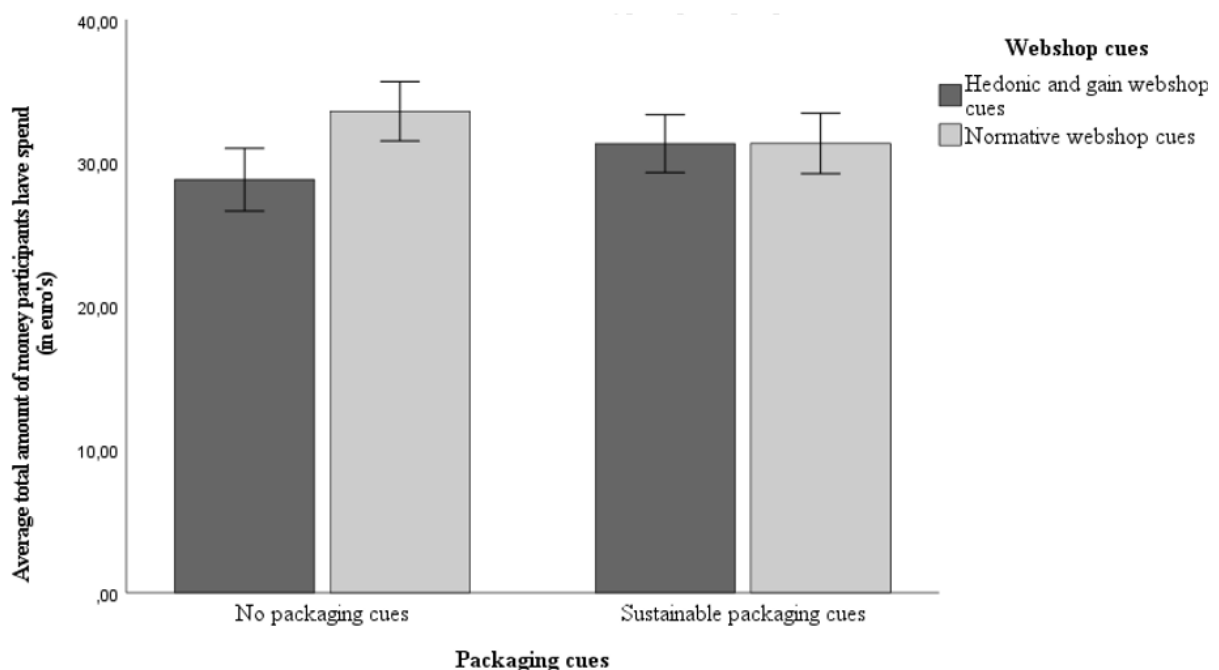
3.3.4 Total amount of money spent

As requested by the anonymised webshop, I test if sustainable packaging cues and normative webshop cues affected the total amount of money consumers spent. I use a two-

way ANOVA since the main analysis did not find mediation on sustainable purchasing (DV1). No assumptions of independence of the sample, linearity, normality and homoscedasticity were violated. No significant effect was found between packaging cues and total amount spent ($F(1,289) = 0.02, p = .900$). However, webshop cues did have an effect on the total amount of money spent ($F(1,289) = 5.05, p = .025, \eta^2 = .017$). Participants that were exposed to normative webshop cues ($M = 32.48, SD = 0.75$) spent €2.40 (95% CI [0,51, 9.030]) more on average than participants in the hedonic and gain webshop condition ($M = 30.08, SD = 0.76$). The interaction effect between packaging cues and webshop cues was significant ($F(1,289) = 4.98, p = .026, \eta^2 = .017$). When participants saw sustainable packaging cues it did not matter if normative webshop cues were present or not. When packaging cues were not present, consumers in the normative webshop condition spent more money (see Figure 11 for bar charts of the estimated means).

Figure 11

Estimated means of total money spent per condition



Note. Error bars represent 95% confidence intervals.

4. Discussion

4.1 General discussion

In this experiment, I investigated whether contextual cues increase sustainable purchasing and sustainable delivery intentions. This study is the first to create a realistic setting by means of a replicated webshop. Specifically, I looked at sustainable packaging cues and normative webshop cues, as well as their combined effect. Using goal-framing theory (Lindenberg & Steg, 2007) as a theoretical framework, I assumed that packaging cues and webshop cues affected sustainable purchasing and sustainable delivery intentions by activating the normative goalframe.

4.1.1 Sustainable purchasing

The data shows that both sustainable packaging cues (in line with hypothesis 1) and normative webshop cues (post-hoc hypothesis) increase the amount of money people spent on sustainable products. Interestingly, in contrast to hypothesis 2, the results show that when products do not have sustainable packaging cues, normative webshop cues increase the amount of money people spent on sustainable products. However, when sustainable packaging cues are present, the effect of adding normative webshop cues effect alters in the other direction where consumers spent less money on sustainable products when they see both packaging and normative cues. I did not find any mediation effect of normative goalframe, thereby rejecting hypothesis 3. Additionally, the results show that the total amount of money people spent was higher if people were reminded of sustainability.

Packaging cues. These findings are in line with prior research based on questionnaires which measured the influence of sustainable packaging cues on consumer behaviour. Previous research found that sustainable packaging cues can increase people's intentions to purchase (Magnier & Schoormans, 2015; Steenis et al., 2017; 2018). My study extends existing literature by providing evidence that these results hold in the context of a realistic webshop

setting. People notice and base their decision on sustainable packaging cues in realistic circumstances.

Webshop cues. The effect of normative webshop cues on the amount of money was not hypothesized a priori since the research design was not optimal to measure the direct effect of normative webshop cues on sustainable purchasing (see paragraph 1.4.2 for reasoning why). It is surprising that the effect is strong enough to be located. However, the effect itself is not surprising. It could be that normative webshop cues function as contextual cues that remind people of sustainability, similar to sustainable delivery intentions (DV2). They could even be more effective in practice than this study could measure. Thus, this study shows that normative webshop cues are promising tools to increase sustainable purchasing.

Additional effect of webshop cues on packaging cues. The manipulations of sustainable packaging cues and normative webshop cues are similar because they are both linked to specific products. Therefore, combining packaging and webshop cues might have little additional influence. However, results show a slightly negative effect when both contextual cues appear. This effect is in line with the experiment by Granato et al. (2022). The authors found that combining different sustainable packaging cues can work counter effectively and decrease the perception of sustainability. People might become sceptical and question if a product is actually sustainable if too many cues are present (Aji & Sutikno, 2015; Magnier & Schoormans, 2015) and choose not to purchase it.

Activation of the normative goalframe. Finally, there is a knowledge gap (Steg et al., 2015) where a solid empirical foundation of the goal-framing theory is not yet established (Thøgersen & Alfinito, 2020). My results might reflect that the goal-framing theory does not hold in webshop contexts. Alternatively, the contextual cues used in this study might not be strong enough to activate the normative goalframe. The contextual cues could have a greater

impact on activating the normative goalframe by using social norms or the presence of other people (Lindenberg & Steg, 2007; 2013).

4.1.2 Sustainable delivery intentions

The second analysis is about sustainable delivery intentions. In contrast to sustainable purchasing, sustainable delivery intentions were measured in hindsight, instead of directly within the webshop, via a scale. I found no effect of sustainable packaging cues, normative webshop cues and the presence of both sustainable packaging cues and normative webshop cues on sustainable delivery intentions, thereby rejecting H4, H5 and H6. No support is found on the mediation pathway via normative goalframe, thereby rejecting hypothesis 7. However, in contrast to the results of sustainable purchasing but in line with the goal-framing theory (Lindenberg & Steg, 2007), the data suggests that higher activation of the normative goalframe correlates with higher sustainable delivery intentions.

Packaging cues, webshop cues and their interaction. A reason for the non-significant effects of packaging cues, webshop cues and their interaction may be that the time between the exposure to packaging cues or webshop cues and the sustainable delivery intention scale is too distant. Cues are potentially most effective when shown simultaneously with a desired sustainable action (Sunstein, 2017). Regardless of their proximity, it is possible that sustainable packaging cues do not increase sustainable delivery intentions. In this study, sustainable packaging and normative webshop cues are linked specifically to products and thereby directly linked to sustainable purchasing. These cues might not spillover to an increase in sustainable delivery intentions. Research shows that spillover is likely to occur when an intervention targets intrinsic motivation and the two sustainable behaviours are similar (Truelove et al., 2014). Negative spillover (i.e. when people are less likely to act sustainably after doing something sustainable) might occur when external cues, such as price incentives, are used to promote sustainability (Maki et al., 2019; Truelove et al., 2014). In this

experiment, I aimed to instigate intrinsic motivation through sustainable packaging cues. However, sustainable purchasing and sustainable delivery choices are different behaviours which might explain that no effects were located.

Activation of the normative goalframe. The effect of activation of the normative goalframe is solely found for sustainable delivery intentions (DV2) but not sustainable purchasing (DV1). This is interesting as both are forms of sustainable consumer behaviour. Naturally, similar measures might correlate with each other due to answer tendencies (Mellenbergh, 2011). This provides a possible explanation for the correlation between the normative goalframe and the SDI-scale. However, the moderate correlation in this study indicates that it is more than answer tendencies. Potentially, the goal-framing theory may be a better predictor for intentions than for actual behaviour, which may be due to the intention-behaviour gap (Grimmer & Miles, 2017).

4.2 Limitations

First, this study is about contextual cues that can influence consumer behaviour. One important contextual hedonic and gain cue that participants encounter is that they are attracted to participate by the possibility to win money and products. A negative side effect could be that the study design unintendedly increased the strength of the hedonic and gain goalframe. In turn, this might explain why none of the effects were mediated via the activation of the normative goalframe. In line with this reasoning, participants that were recruited via Prolific had a stronger financial stimulus (i.e. as they received a salary via Prolific of filling out questionnaires) and showed a lower activation of the normative goalframe compared to the group participants that was recruited via the newsletter. Measuring gain and hedonic goalframes would help gain more insight in this idea, but lies beyond the scope of this thesis.

A second limitation was the measure of sustainable purchasing, which I defined as the amount of money people spent on eight products that receive sustainable packaging cues in

the experimental condition of sustainable packaging. Using this definition, spending more money on sustainable products is considered more sustainable. However, the most sustainable purchase is one a person does not make (RVO, 2021). It could be argued that cues that remind people of sustainability currently even decrease sustainable behaviour. It is interesting to see whether people consider the purchase of more sustainable products to be more sustainable or not. This study did not consider the interpretation people have of sustainability. Furthermore, no participants reported an interpretation of sustainability in the open question field of the questionnaire.

Third, sustainable packaging cues potentially do not have an equal effect in signalling sustainability for all products. People gain their opinion about sustainability of a product on the product-packaging combination (Magnier & Schoormans, 2015; Granato et al., 2022). If the overall image of a sustainable product does not signal sustainability, people are more likely to be sceptical of this product in their evaluation (Aji & Sutikno, 2015; Magnier & Schoormans, 2015). Within this study, the products that received an eco-label were randomly selected. Therefore, the overall evaluation of the product's sustainability might differ per product. The measure for sustainable purchasing does not take this difference of perceived sustainability into account.

Fourth, activation of a goalframe fluctuates within a person over time (Lindenberg & Steg, 2007). Measuring activation of the normative goalframe might be difficult using one scale at one point in time. A pre- and post-test might have given a better idea of activation of the normative goalframe within a person. However, this was not included in this study to minimize the influence on participants.

Lastly, this study found a smaller effect sizes for sustainable purchasing ($R^2 = .031$) than was estimated a priori and therefore the study is lacking power.

4.3 Practical implications

My findings have two major practical implications for addressing sustainable consumer behaviour and decreasing their climate impact.

First, brands or organisations could use sustainable packaging cues or normative webshop cues to communicate sustainability to consumers and help them pick more sustainable options. Especially normative webshop cues show great promise in effectively reminding consumers of sustainability within a webshop. Brands and organisations should be wary that increasing the quantity of sustainability reminders might not enhance sustainable consumer behaviour further. This might be different if the webshop cues function as broader reminders of social norms. For example, statements that other consumers find sustainability important might effectively be combined with sustainable packaging cues.

Second, this study showed that approximate half of the consumers chose the relatively unknown option of having products delivered in reusable delivery packaging instead of the conventional option that costs them less effort. Therefore, organisations can try to implement more sustainable delivery options as consumers will be likely to accept and choose them.

4.4 Future directions

This study showed that normative webshop cues show great promise in increasing sustainable purchasing. Future research could examine alternative forms of manipulating normative webshop cues as these might be more effective in activating the normative goalframe and increasing sustainable consumer behaviour. There are three types of manipulations that are particularly interesting: i) statements of social norms (e.g. “our consumers find sustainability the most important reason to purchase a product.”), ii) alteration or amount of positive reviews, and iii) presence of other people. This is because the normative goalframe can best be activated by social norms and the presence of other people (Lindenberg & Steg, 2007; 2013).

Further research on consumers choice to pick sustainable delivery options is highly relevant due to the climate impact of this behaviour (Pålsson et al., 2017; Escursell et al., 2021; Velazques & Chankov, 2019). Future studies could explore the relationship between sustainability cues on sustainable delivery options and the choice of consumers to pick these delivery options. It is especially interesting because it is likely that no spillover occurs if cues are placed on products themselves (Maki et al., 2019; Truelove et al., 2014). Sustainable packaging cues, and potentially normative webshop cues, are likely to solely increase sustainable purchasing and not sustainable delivery choices.

Future research could expand on the realistic (replicated) design by including more brands and more products which will increase the realism of the scenario further.

4.5 Conclusion

In sum, with the use of an experiment with a replicated webshop, I found that sustainable packaging cues and normative webshop cues can increase the amount of money people spend on sustainable products. However, when these cues are combined, people spend less money on sustainable products. No effects were found for the underlying process of activation of the normative goalframe. In addition, no effects of packaging cues and webshop cues were found on sustainable delivery intentions. These findings suggest that it can be helpful to use contextual cues such as packaging cues and webshop cues to help consumers decrease their climate impact. Especially normative webshop cues show great promise and future research should look if different normative webshop cues be effective. In addition, these finding suggest that people are open to sustainable delivery options. Future studies should look if cues placed specifically on sustainable delivery options help consumers choose them to decrease the negative climate impact of the last mile delivery.

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References

- Accenture. (2021). *The Sustainable Last Mile*. Retrieved from <https://www.accenture.com/acnmedia/PDF-148/Accenture-Sustainable-Mile-POV.pdf#zoom=40>
- Aji, H. M., & Sutikno, B. (2015). The extended consequence of greenwashing: Perceived consumer skepticism. *International Journal of Business and Information*, 10(4), 433.
- Anshassi, M., Sackles, H., & Townsend, T. G. (2021). A review of LCA assumptions impacting whether landfilling or incineration results in less greenhouse gas emissions. *Resources, Conservation and Recycling*, 174, 105810. <https://doi.org/10.1016/j.resconrec.2021.105810>
- Azzi, A., Battini, D., Persona, A., & Sgarbossa, F. (2012). Packaging design: general framework and research agenda. *Packaging Technology and Science*, 25(8), 435-456. <https://doi.org/10.1002/pts.993>
- Bates, O., Friday, A., Allen, J., Cherrett, T., McLeod, F., Bektas, T., Nguyen, T., Piecyk, M., Piotrowska, M., Wise, S. & Davies, N. (2018). Transforming last-mile logistics: Opportunities for more sustainable deliveries. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 526, 1-14. <https://doi.org/10.1145/3173574.3174100>
- Bénabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *American economic review*, 96(5), 1652-1678. <https://doi.org/10.1257/aer.96.5.1652>
- Bhatt, S., Ye, H., Deutsch, J., Jeong, H., Zhang, J., & Suri, R. (2021). Food waste and upcycled foods: Can a logo increase acceptance of upcycled foods?. *Journal of Food Products Marketing*, 27(4), 188-203. <https://doi.org/10.1080/10454446.2021.1955798>

- Bolderdijk, J. W., Steg, L., Geller, E. S., Lehman, P. K., & Postmes, T. (2013). Comparing the effectiveness of monetary versus moral motives in environmental campaigning. *Nature Climate Change*, 3(4), 413-416. <https://doi.org/10.1038/nclimate1767>
- B-open. (2020). *Consument Waardeert Duurzaamheid Bij Merken Steeds Meer*. Retrieved from <https://marketresponse.nl/producten/monitor-merk-maatschappij/>
- Bosona, T. (2020). Urban freight last mile logistics challenges and opportunities to improve sustainability: a literature review. *Sustainability*, 12(21), 69-87. <https://doi.org/10.3390/su12218769>
- Bouman, T., Steg, L., & Perlaviciute, G. (2021). From values to climate action. *Current Opinion in Psychology*, 42, 102-107. <https://doi.org/10.1016/j.copsyc.2021.04.010>
- CBS. (2020). *Welk Percentage Van Nederlanders Koopt Online? En wat*. Retrieved from <https://longreads.cbs.nl/nederland-in-cijfers-2020/welk-percentage-van-nederlanders-koopt-online-en-wat/>
- Coelho, P. M., Corona, B., ten Klooster, R., & Worrell, E. (2020). Sustainability of reusable packaging—Current situation and trends. *Resources, Conservation & Recycling*, 6, 100037. <https://doi.org/10.1016/j.rcrx.2020.100037>
- De Groot, J. I. M., & Steg, L. (2009). Mean or green: Which values can promote stable pro-environmental behavior? *Conservation Letters*, 2, 61-66. <https://doi.org/10.1111/j.1755-263X.2009.00048.x>
- De Kok, E. (2022). *Online shoppen, hoe erg is dat nu eigenlijk voor het klimaat? Hier*. Retrieved from <https://www.hier.nu/themas/makkelijk-energie-besparen/online-shoppen-hoe-erg-is-dat-nu-eigenlijk-voor-het-klimaat>
- DPDgroup. (2018). *E-shopper Barometer Report 2018*. Retrieved from <https://www.dpd.com/dpd-nl/wp-content/uploads/sites/220/2019/08/E-shopper-barometer-report-2018.pdf>

- Ekvall, T., Gottfridsson, M., Nellström, M., Nilsson, J., Rydberg, M., & Rydberg, T. (2021). Modelling incineration for more accurate comparisons to recycling in PEF and LCA. *Waste Management*, 136, 153-161. <https://doi.org/10.1016/j.wasman.2021.09.036>
- EPA. (2018). *Containers and Packaging: Product-Specific Data*. Retrieved March 15, 2022, from <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific#:~:text=Containers%20and%20packaging%20make%20up,beverages%2C%20medications%20and%20cosmetic%20products.>
- Escursell, S., Llorach-Massana, P., & Roncero, M. B. (2021). Sustainability in e-commerce packaging: A review. *Journal of cleaner production*, 280(1), 124-314. <https://doi.org/10.1016/j.jclepro.2020.124314>
- Eurostat. (2020). *Energy, transport and environment statistics – 2020 edition*. Retrieved from <https://ec.europa.eu/eurostat/documents/3217494/11478276/KS-DK-20-001-EN-N.pdf/06ddaf8d-1745-76b5-838e-013524781340?t=1605526083000>
- Eurostat. (2022a). *Recycling Rate of Municipal Waste*. Retrieved from https://ec.europa.eu/eurostat/databrowser/view/t2020_rt120/default/table?lang=en
- Eurostat. (2022b). *Recycling rates for packaging waste*. Retrieved from <https://ec.europa.eu/eurostat/databrowser/view/ten00063/default/table?lang=en>
- Evans, L., Maio, G. R., Corner, A., Hodgetts, C. J., Ahmed, S., & Hahn, U. (2013). Self-interest and pro-environmental behaviour. *Nature Climate Change*, 3(2), 122-125. <https://doi.org/10.1038/nclimate1662>
- Finney, S. L. (2014). Encouraging sustainable consumption: An exploration of consumer behaviour. *The marketing review*, 14(2), 189-203. <https://doi.org/10.1362/146934714X14024778816959>

- Gatersleben, B., Murtagh, N., & Abrahamse, W. (2014). Values, identity and pro-environmental behaviour. *Contemporary Social Science*, 9(4), 374-392.
<https://doi.org/10.1080/21582041.2012.682086>
- Geiger, J. (2020). Context matters: Three ways of how the context influences recycling behaviour. *University of Groningen*. <https://doi.org/10.33612/diss.131464819>
- Granato, G., Fischer, A. R. H., & van Trijp, H. C. M. (2022). A meaningful reminder on sustainability: when explicit and implicit packaging cues meet. *Journal of Environmental Psychology*, 79, 101724–101724.
<https://doi.org/10.1016/j.jenvp.2021.101724>
- Green, K., Morton, B., & New, S. (1996). Purchasing and environmental management: interactions, policies and opportunities. *Business strategy and the environment*, 5(3), 188-197. [https://doi.org/10.1002/\(SICI\)1099-0836\(199609\)5:3<188::AID-BSE60>3.0.CO;2-P](https://doi.org/10.1002/(SICI)1099-0836(199609)5:3<188::AID-BSE60>3.0.CO;2-P)
- Grimmer, M., & Miles, M. P. (2017). With the best of intentions: a large sample test of the intention-behaviour gap in pro-environmental consumer behaviour. *International Journal of Consumer Studies*, 41(1), 2-10. <https://doi.org/10.1111/ijcs.12290>
- Grimmer, M., & Miles, M. P. (2017). With the best of intentions: a large sample test of the intention-behaviour gap in pro-environmental consumer behaviour. *International Journal of Consumer Studies*, 41(1), 2-10. <https://doi.org/10.1111/ijcs.12290>
- Guillard, V., Gaucel, S., Fornaciari, C., Angellier-Coussy, H., Buche, P., & Gontard, N. (2018). The next generation of sustainable food packaging to preserve our environment in a circular economy context. *Frontiers in nutrition*, 5, 121.
<https://doi.org/10.3389/fnut.2018.00121>
- Hassan, L. M., Shiu, E., & Shaw, D. (2016). Who says there is an intention–behaviour gap? Assessing the empirical evidence of an intention–behaviour gap in ethical

- consumption. *Journal of Business Ethics*, 136, 219-236.
<https://doi.org/10.1007/s10551-014-2440-0>
- Hayes, A. F. (2022). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. *Guilford publications*.
- Herbes, C., Beuthner, C., & Ramme, I. (2020). How green is your packaging—A comparative international study of cues consumers use to recognize environmentally friendly packaging. *International Journal of Consumer Studies*, 44(3), 258-271.
<https://doi.org/10.1111/ijcs.12560>
- Honig, B., Potting, J. & Van Daele, E. (2022). *Hoeveelheid en Milieudruk van Verzendmaterialen voor Post en Pakketten voor Consumenten*. Recycling Netwerk Benelux: Utrecht. Retrieved from <https://recyclingnetwerk.org/wp-content/uploads/2022/02/RNB-Hoeveelheid-en-milieudruk-van-verzendmaterialen-voor-post-en-pakketten-voor-consumenten.pdf>
- Hoornweg, D., & Bhada-Tata, P. (2012). *What a waste: A global review of solid waste management*. *Urban development series, knowledge papers, 15*. Washington, DC: World Bank.
- IPCC. (2018). *Global warming of 1.5° C: an IPCC special report on the impacts of global warming of 1.5° C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. In Press.
- IPCC. (2022). *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, NY, USA.
<https://doi.org/10.1017/9781009157926>

- Ischen, C., Meijers, M. H., Vandeberg, L., & Smit, E. G. (2022). Seen as green? Assessing the salience and greenness of environmentally friendly packaging cues. *Journal of Food Products Marketing*, 28(1), 31-48. <https://doi.org/10.1080/10454446.2022.2038757>
- Ketelsen, M., Janssen, M., & Hamm, U. (2020). Consumers' response to environmentally-friendly food packaging-A systematic review. *Journal of Cleaner Production*, 254(1), 120-123. <https://doi.org/10.1016/j.jclepro.2020.120123>
- Lagorio, A., Pinto, R., & Golini, R. (2016). Research in urban logistics: a systematic literature review. *International Journal of Physical Distribution and Logistics Management*, 46(10), 908–931. <https://doi.org/10.1108/IJPDLM-01-2016-0008>
- Lindenberg, S., & Steg, L. (2007). Normative, gain and hedonic goal frames guiding environmental behavior. *Journal of Social issues*, 63(1), 117-137. <https://doi.org/10.1111/j.1540-4560.2007.00499.x>
- Lindenberg, S., & Steg, L. (2013). Goal-framing theory and norm-guided environmental behavior. In *Encouraging sustainable behavior* (pp. 37-54). Psychology Press.
- Lindh, H., Olsson, A., & Williams, H. (2016). Consumer Perceptions of Food Packaging: Contributing to or Counteracting Environmentally Sustainable Development? *Packaging Technology and Science*, 29(1), 3-23. <https://doi.org/10.1002/pts.2184>
- Magnier, L., & Crié, D. (2015). Communicating packaging eco-friendliness. *International Journal of Retail & Distribution Management*, 43, 350–366. <https://doi.org/10.1108/IJRDM-04-2014-0048>
- Magnier, L., & Schoormans, J. (2015). Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal claim and environmental concern. *Journal of Environmental Psychology*, 44, 53–62. <https://doi.org/10.1016/j.jenvp.2015.09.005>

- Magnier, L., & Schoormans, J. (2017). How do packaging material, colour and environmental claim influence package, brand and product evaluations?. *Packaging Technology and Science*, 30(11), 735-751. <https://doi.org/10.1002/pts.2318>
- Mahmoudi, M., & Parviziomran, I. (2020). Reusable packaging in supply chains: A review of environmental and economic impacts, logistics system designs, and operations management. *International Journal of Production Economics*, 228, 107730. <https://doi.org/10.1016/j.ijpe.2020.107730>
- Maki, A., Carrico, A. R., Raimi, K. T., Truelove, H. B., Araujo, B., & Yeung, K. L. (2019). Meta-analysis of pro-environmental behaviour spillover. *Nature Sustainability*, 2(4), 307-315. <https://doi.org/10.1038/s41893-019-0263-9>
- Martin, D., & Schouten, J. (2012). *Sustainable marketing*. New Jersey: Prentice Hall.
- Mellenbergh, G. J. (2011). *A conceptual introduction to psychometrics : development, analysis and application of psychological and educational tests*. Eleven international publishing.
- Morris, J. (2005). Comparative LCAs for curbside recycling versus either landfilling or incineration with energy recovery (12 pp). *The International Journal of Life Cycle Assessment*, 10(4), 273-284. <https://doi.org/10.1065/lca2004.09.180.10>
- Netherlands Institute for Sustainable Packaging (n.d.). *Duurzame product verpakkingscombinatie*. Retrieved February 22, 2022, from <https://kidv.nl/duurzame-product-verpakkingscombinatie>
- Pålsson, H., Pettersson, F., & Hiselius, L. W. (2017). Energy consumption in e-commerce versus conventional trade channels-Insights into packaging, the last mile, unsold products and product returns. *Journal of cleaner production*, 164, 765-778. <https://doi.org/10.1016/j.jclepro.2017.06.242>

- Pancer, E., McShane, L., & Noseworthy, T. J. (2017). Isolated environmental cues and product efficacy penalties: The color green and eco-labels. *Journal of Business Ethics*, 143, 159–177. <https://doi.org/10.1007/s10551-015-2764-4>
- Popovic, I., Bossink, B. A., & van der Sijde, P. C. (2019). Factors influencing consumers' decision to purchase food in environmentally friendly packaging: what do we know and where do we go from here?. *Sustainability*, 11(24), 7197
<https://doi.org/10.3390/su11247197>
- Prakash, G., Choudhary, S., Kumar, A., Garza-Reyes, J. A., Khan, S. A. R., & Panda, T. K. (2019). Do altruistic and egoistic values influence consumers' attitudes and purchase intentions towards eco-friendly packaged products? an empirical investigation. *Journal of Retailing and Consumer Services*, 50, 163–169.
<https://doi.org/10.1016/j.jretconser.2019.05.011>
- PWC. (2022). *Consumers respond to waves of disruption: June 2022 Global Consumer Insights Pulse Survey*. Retrieved from
<https://www.pwc.com/gx/en/industries/consumer-markets/consumer-insights-survey.html>
- Rettie, R., & Brewer, C. (2000). The verbal and visual components of package design. *The Journal of Product and Brand Management*, 9(1), 56-70.
<https://doi.org/10.1108/10610420010316339>
- Rhein, S., & Schmid, M. (2020). Consumers' awareness of plastic packaging: more than just environmental concerns. *Resources, Conservation & Recycling*, 162.
<https://doi.org/10.1016/j.resconrec.2020.105063>
- Rokka, J., & Uusitalo, L. (2008). Preference for green packaging in consumer product choices – Do consumers care? *International Journal of Consumer Studies*, 32(5), 516- 525.
<https://doi.org/10.1111/j.1470-6431.2008.00710.x>

- RVO. (2021). R-ladder – Strategieën van Circulariteit. Retrieved from <https://www.rvo.nl/onderwerpen/duurzaam-ondernemen/circulaire-economie/r-ladder>
- Schoormans, J. P., & Robben, H. S. (1997). The effect of new package design on product attention, categorization and evaluation. *Journal of Economic psychology*, 18(2-3), 271-287. [https://doi.org/10.1016/S0167-4870\(97\)00008-1](https://doi.org/10.1016/S0167-4870(97)00008-1)
- Schyns, Z. O., & Shaver, M. P. (2021). Mechanical recycling of packaging plastics: A review. *Macromolecular rapid communications*, 42(3), 2000415. <https://doi.org/10.1002/marc.202000415>
- Sievering, O. (2020). Environmental impact of shopping via the internet. *Central and Eastern European eDem and eGov Days*, 338, 33-42. <https://doi.org/10.24989/ocg.v.338.2>
- Silpa, K., Yao, L., Bhada-Tata, P., Van Woerden, F. (2018). *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*. World Bank Group.
- Statista. (2022a). *Retail e-commerce sales growth worldwide 2017-2025*. Retrieved from <https://ecommerceguide.com/ecommerce-statistics/>
- Statista. (2022b). *Returns of online purchases by category in the U.S. 2021*. Retrieved from <https://www.statista.com/forecasts/997235/returns-of-online-purchases-by-category-in-the-us>
- Steenis, N. D., van der Lans, I. A., van Herpen, E., & van Trijp, H. C. (2018). Effects of sustainable design strategies on consumer preferences for redesigned packaging. *Journal of Cleaner Production*, 205, 854–865. <https://doi.org/10.1016/j.jclepro.2018.09.137>
- Steenis, N. D., van Herpen, E., van der Lans, I. A., Ligthart, T. N., & van Trijp, H. C. (2017). Consumer response to packaging design: The role of packaging materials and graphics in sustainability perceptions and product evaluations. *Journal of Cleaner Production*, 162, 286–298. <https://doi.org/10.1016/j.jclepro.2017.06.036>

- Steffen, W., Rockström, J., Richardson, K., Lenton, T. M., Folke, C., Liverman, D., Summerhayes, C. P., Barnosky, A. D., Cornell, S. E., Crucifix, M., Donges, J. F., Fetzer, I., Lade, S. j., Scheffer, M., Winkelmann, R. & Schellnhuber, H. J. (2018). Trajectories of the Earth System in the Anthropocene. *Proceedings of the National Academy of Sciences*, 115(33), 8252-8259. <https://doi.org/10.1073/pnas.1810141115>
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of environmental psychology*, 29(3), 309-317. <https://doi.org/10.1016/j.jenvp.2008.10.004>
- Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology*, 38, 104–115. <https://doi.org/10.1016/j.jenvp.2014.01.002>
- Steg, L., Lindenberg, S., & Keizer, K. (2015). Intrinsic motivation, norms and environmental behaviour: The dynamics of overarching goals. *International Review of Environmental and Resource Economics*, 9, 179–207. <https://doi.org/10.1561/101.00000077>
- Stichting Afvalfonds Verpakkingen. (2020). *Verpakkingen in de Circulaire Economie: Recycling Verpakkingen Nederland 2020*. Retrieved from <https://afvalfondsverpakkingen.nl/a/i/Verpakkingen-in-de-circulaire-economie-2020.pdf>
- Stolz, J., Molina, H., Ramírez, J., & Mohr, N. (2013). Consumers' perception of the environmental performance in retail stores: an analysis of the German and the Spanish consumer. *International Journal of Consumer Studies*, 37(4), 394-399. <https://doi.org/10.1111/ijcs.12028>
- Sunstein, C. (2017). Nudges that fail. *Behavioural Public Policy*, 1(1), 4-25. <https://doi.org/10.1017/bpp.2016.3>

- Tang, Y., Chen, S., & Yuan, Z. (2019). The effects of hedonic, gain, and normative motives on sustainable consumption: Multiple mediating evidence from China. *Sustainable Development*, 28(4), 741-750 <https://doi.org/10.1002/sd.2024>
- Thøgersen, J., & Alfinito, S. (2020). Goal activation for sustainable consumer choices: A comparative study of Denmark and Brazil. *Journal of Consumer Behaviour*, 19(6), 556-569. <https://doi.org/10.1002/cb.1824>
- Thøgersen, J., & Crompton, T. (2009). Simple and painless? The limitations of spillover in environmental campaigning. *Journal of Consumer Policy*, 32, 141-163. <https://doi.org/10.1007/s10603-009-9101-1>
- Thøgersen, J., Haugaard, P., & Olesen, A. (2010). Consumer responses to ecolabels. *European Journal of Marketing*, 44 (11), 1787–1810. <https://doi.org/10.1108/03090561011079882>
- Thuiswinkel.org. (2021a). *Factsheet Retouren*. Retrieved from https://cms.thuiswinkel.org/data/uploads/Factsheet_opmaak_Retouren_maart_2021.pdf
- Thuiswinkel.org. (2021b). *Brancheverduurzamingsplan Verpakken E-commerce sector 2019-2022*. Retrieved from https://www.thuiswinkel.org/media/4xlcokw0/brancheverduurzamingsplan_2019-2022_thuiswinkel-org.pdf
- Truelove, H. B., Carrico, A. R., Weber, E. U., Raimi, K. T., & Vandenbergh, M. P. (2014). Positive and negative spillover of pro-environmental behavior: An integrative review and theoretical framework. *Global Environmental Change*, 29, 127-138. <https://doi.org/10.1016/j.gloenvcha.2014.09.004>
- Truelove, H. B., Carrico, A. R., Weber, E. U., Raimi, K. T., & Vandenbergh, M. P. (2014). Positive and negative spillover of pro-environmental behavior: An integrative review

and theoretical framework. *Global Environmental Change*, 29, 127-138.

<https://doi.org/10.1016/j.gloenvcha.2014.09.004>

Turaga, R. M. R., Howarth, R. B., & Borsuk, M. E. (2010). Pro-environmental behavior: Rational choice meets moral motivation. *Annals of the New York Academy of Sciences*, 1185(1), 211-224. <https://doi.org/10.1111/j.1749-6632.2009.05163.x>

Underwood, R. L., Klein, N. M., & Burke, R. (2001). Packaging communication: Attentional effects of product imagery. *Journal of Product & Brand Management*, 10(7), 403-422. <https://doi.org/10.1108/10610420110410531>

Unilever. (2017). *Report shows a third of consumers prefer sustainable brands*. Retrieved from <https://www.unilever.com/news/press-and-media/press-releases/2017/report-shows-a-third-of-consumers-prefer-sustainable-brands/>

Van Birgelen, M., Semeijn, J., & Keicher, M. (2009). Packaging and proenvironmental consumption behavior: Investigating purchase and disposal decisions for beverages. *Environment and Behavior*, 41(1), 125-146. <https://doi.org/10.1177/0013916507311140>

Van Dam, Y. K. (1996). Environmental assessment of packaging: The consumer point of view. *Environmental Management*, 20(5), 607-614. <https://doi.org/10.1007/BF01204134>

Van den Burg, D., Streng, R. & Van Knippenberg, L. (2021). *Shopping tomorrow: the future of shopping according to consumers*. Retrieved from <https://www.shoppingtomorrow.nl/nl/download/612f82b771d3f>

Van der Werff, E., Steg, L., & Keizer, K. (2013a). I am what I am, by looking past the present: The influence of biospheric values and past behaviour on environmental self-identity. *Environment and Behavior*. <http://doi.org/10.1177/0013916512475209>

- Van Doorn, J., Risselada, H., & Verhoef, P. C. (2021). Does sustainability sell? The impact of sustainability claims on the success of national brands' new product introductions. *Journal of Business Research*, 137, 182-193.
<https://doi.org/10.1016/j.jbusres.2021.08.032>
- Van Loon, P., Deketele, L., Dewaele, J., McKinnon, A., & Rutherford, C. (2015). A comparative analysis of carbon emissions from online retailing of fast moving consumer goods. *Journal of Cleaner Production*, 106, 478-486.
<https://doi.org/10.1016/j.jclepro.2014.06.060>
- Vaverková, M. D. (2019). Landfill impacts on the environment. *Geosciences*, 9(10), 431.
<https://doi.org/10.3390/geosciences9100431>
- Velazquez, R., & Chankov, S. M. (2019). Environmental impact of last mile deliveries and returns in fashion E-commerce: a cross-case analysis of six retailers. *International Conference on Industrial Engineering and Engineering Management (IEEM)*, 1099-1103. <https://doi.org/10.1109/IEEM44572.2019.8978705>
- VerpakkingsManagement. (2022). *Verzendverpakkingen Geven Jaarlijks 87 Miljoen Kilo Afval*. Retrieved from
<https://verpakkingsmanagement.nl/nieuws/verzendverpakkingen-geven-jaarlijks-87-miljoen-kilo-afval>
- Wee, S. C., Choong, W. W., & Low, S. T. (2021). Can “Nudging” Play a Role to Promote Pro-Environmental Behaviour?. *Environmental Challenges*, 5, 100364.
<https://doi.org/10.1016/j.envc.2021.100364>
- Wood, S., Robinson, S., & Poor, M. (2018). The efficacy of green package cues for mainstream versus niche brands: how mainstream green brands can suffer at the shelf. *Journal of Advertising Research*, 58, 165–176. <https://doi.org/10.2501/JAR-2018-025>

World Economic Forum. (2018). *The future of the Last-Mile Ecosystem: Transition roadmaps for Public- and Private-Sector Players*. Retrieved from

https://www3.weforum.org/docs/WEF_Future_of_the_last_mile_ecosystem.pdf

Appendix A

The Full Questionnaire

Vragenlijst deel 1

1.1 Voorafgaand

Welkom en leuk dat je meedoet! Het doel van dit onderzoek is om de gebruiksvriendelijkheid van de *[anonymised webshop]* te optimaliseren voor verschillende klanten. Daarbij kijken we naar de consumentbehoefte, uitstraling van de webshop en duurzaamheid. Dit onderzoek is in samenwerking met de Rijksuniversiteit Groningen. Volgens de ethische richtlijnen van de universiteit moet een onderzoek altijd uitgebreide informatie vooraf geven. Deze informatie volgt hieronder.

Informatieformulier.

1. Geïnfomeerde toestemming voor deelname en verwerken van persoonsgegevens. [*Ja / Nee*].
2. Geïnfomeerde toestemming voor dataopslag [*Ja / Nee*].
3. Ik heb goed begrip van de Nederlandse taal. [*Ja / Nee*].**
4. Ik ben 16 jaar of ouder. [*Ja / Nee*].**

*Is een van de vragen met nee wordt beantwoord dan kan de participant niet meedoen aan het onderzoek. Automatisch bericht dat ze helaas niet mee kunnen doen.

1.2 Informatie

Zo meteen word je naar een versimpelde versie van de *[anonymised webshop]* website toe geleid. Hier mag je zelf producten voor een bedrag tot €50 uitkiezen. **LET OP:**

- Selecteer producten die je daadwerkelijk wilt hebben want vijf deelnemers kunnen de **geselecteerde producten winnen** (tot €50).
- **Besteed je niet de totale €50? Geen probleem**, het resterende bedrag winnen deze vijf winnaars in de vorm van een *[anonymised webshop]* waardebon.

* Participanten worden naar de webshop geleid en na het maken van keuzes naar het tweede deel van de vragenlijst*

Vragenlijst deel 2

2.1 Manipulatie check

Gebruikserving en uitstraling van de webshop. Antwoordmogelijkheden: [*Ja / Nee*]

1. Het design van de webshop was fijn om naar te kijken.
2. Ik zag op de overzichtspagina van de webshop kortingslabels (bv. “60% korting”). (Manipulation check normative webshop).
3. Ik zag op de overzichtspagina van de webshop duurzaamheidslabels (bv. “duurzaam”). (Manipulation check normative webshop).
4. Ik zag op een aantal producten in de webshop een eco-label en groene blaadjes. (Manipulation check sustainable packaging).

5. Ik zag op de overzichtspagina van de webshop in één oogopslag hoe andere klanten de producten hebben beoordeeld.
6. Ik vond de webshop **niet** prettig in gebruik. (Reversed)
7. Ik had voldoende informatie over het product om te beslissen of ik het wil kopen.
8. De productinformatie was duidelijk.
9. De webshop had genoeg functionaliteiten om makkelijk producten te kopen.

2.2 Goal frames *

* Tang et al. (2019) created a scale 5 items to measure the normative goal on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) → (1= Sterk mee oneens tot 7 = sterk mee eens).

Klanten van [*anonymised webshop*].

Klik aan wat voor jou **op dit moment** geldt.

1. Ik ben me bewust van mijn rol in milieubescherming.
2. Ik voel me moreel verplicht om duurzame aankopen te doen.
3. Duurzame aankopen kunnen mijn CO2 voetafdruk verkleinen en daarmee klimaatverandering vertragen.
4. Dit is een alertheidscheck. Beantwoord deze vraag met 'Sterk mee eens'.
5. Ik kies duurzame producten omdat ik een grote sociale verantwoordelijkheid voel.
6. De meeste mensen die belangrijk voor mij zijn staan achter mijn duurzame aankoopgedrag.

2.3 Demografische vragen

1. Wat is je leeftijd? [*antwoord in jaren*]
2. Wat is je geslacht? [man / vrouw / wil ik niet zeggen / anders, namelijk...]
3. Wat is je nationaliteit? [Nederlandse, Belgische, anders, namelijk...]
4. Wat is je hoogst afgeronde opleiding? [basisschool / middelbare school / MBO / HBO / Universiteit]
5. Heb je eerder al eens iets gekocht bij de [*anonymised webshop*]? [ja, alleen via de online winkel / ja, alleen via de offline winkel / ja, zowel via de online als offline winkel / nee]

2.4 Duurzame verzendingententies*

* de vragenlijst is opgesteld volgens de richtlijnen uit het boek van Mellenbergh (2011). De antwoordopties zijn: [1. Nooit, 2. Zelden, 3. Soms, 4. Regelmatig, 5. Vaak, 6. Heel vaak, 7. Altijd].

We zijn benieuwd naar de keuzes die onze klanten zouden maken als we bepaalde bezorgopties toevoegen aan de webshop.

Als jij kunt kiezen, **welke keuzes zou jij willen maken** voor de levering van je volgende pakketje?

1. Als ik de optie heb, laat ik mijn volgende pakketje bij een afhaalpunt bezorgen (in plaats van thuis). → If I have the option, I let my next parcel be delivered at a pick-up point (instead of home).

2. Als ik mijn volgende pakketje bij mij thuis laat bezorgen, dan zorg ik dat het bij de eerste poging geleverd kan worden. → If I choose my next parcel to be delivered at home, I make sure the parcel can get delivered at the first try.
3. Als ik de optie heb kies ik voor een duurzame vervoerder voor mijn volgende pakketje. → If I have the option, I will choose a sustainable mode of transportation for the delivery of my next parcel.
4. Als ik de optie heb, kies ik voor een duurzame vervoerder voor de levering van mijn volgende pakketje, ongeacht de prijs. → If I have the option, I will choose for a sustainable mode of transportation for the delivery of my next parcel, regardless the price.
5. Als ik de optie heb, kies ik voor een duurzame vervoerder voor de levering van mijn volgende pakketje, ongeacht dat de levering langer duurt dan de gebruikelijke 2 werkdagen. → If I have the option, I will choose for a sustainable mode of transportation for the delivery of my next parcel, regardless whether the delivery will take longer than the usual 2 working days.
6. Als een duurzame bezorging van mijn volgende pakketje langer dan 2 werkdagen duurt, bestel ik ergens waar de levering sneller, maar minder duurzaam is. → If a sustainable delivery takes longer than two working days, I order somewhere where the delivery is less sustainable but faster.
7. Als ik de optie heb, kies ik in het vervolg producten met zo min mogelijk verpakkingsmateriaal. → If I have the option, next time I order I will choose products that have as little packaging material as possible.
8. Als ik de optie heb, laat ik tijdens mijn volgende bestelling in één keer meer producten bezorgen om mijn CO2 voetafdruk te verkleinen. → If I have the option, I will make sure more products are delivered in one try to decrease my carbon footprint.
9. Als ik de optie heb, kies ik voor mijn volgende pakketje een herbruikbare verzendverpakking. → If I have the option, I choose for a reusable delivery packaging for the delivery of my next parcel.
10. Als ik een volgende keer een verpakking na ontvangst moet terugbrengen naar een brievenbus of pakketpunt dan doe ik dat. → If, next time I order, I have to return the reusable delivery packaging after delivery to a mailbox or delivery point, I will do so.
11. De volgende keer dat ik iets bestel denk ik goed na of ik het echt wil hebben zodat ik niets hoeft te retourneren. → Next time before I order something I will make sure that I truly want it so I do not have to return anything.

2.5 Afsluitende vragen

1. Waar denk je dat dit onderzoek over ging?
[Open antwoord mogelijkheid]
Debriefing van onderzoek.
2. Heb je nog opmerkingen naar aanleiding van dit onderzoek?
[Open antwoord mogelijkheid]
3. Als je mee wilt doen om de €50 waardebon te kunnen winnen dan kun je hier je e-mailadres achterlaten. Uiterlijk [*datum*] wordt contact gezocht met de vijf winnaars. Als je je emailadres niet wilt achterlaten kun je deze vraag leeg laten. **

[E-mailadres]

Dank je wel voor je deelname.

** these questions are not asked for the prolific group. The prolific group automatically participated within the raffle.

Appendix B

Background Literature for Questionnaire

Picking up a parcel by walking or biking to a pick-up point

Transportation costs may have a higher climate impact for online compared to conventional purchases (Pålsson et al., 2017; Escursell et al., 2021; Velazques & Chankov, 2019). Whether conventional or ecommerce has a larger climate impact mostly depends on the last mile delivery. If consumers take the car to a pick-up point or store this results in a similar or higher climate impact of at home deliveries. Yet, if consumers walk or bike to the store or pick-up point, this decreases the climate impact (Pålsson et al., 2017; Escursell et al., 2021).

Choosing a sustainable transportation company

Transportation companies are making changes in logistics and methods of delivery that can decrease the delivery of a package greatly (Bates et al., 2018; Accenture, 2020). If consumers, when given the opportunity, choose a sustainable transportation company, this can reduce the climate impact (Van Loon et al., 2015).

Choosing a reusable packaging

Currently, in the Netherlands alone, online purchases require yearly 87 million kg of additional packaging materials to protect parcels and ship multiple products at once (Honig et al., 2022; VerpakkingsManagement, 2022). This creates additional waste and increases the weight and space of parcels, resulting in heavier and more transportation (Escursel et al., 2021; Honig et al., 2022). Consumers, when given the choice, that choose reusable packaging can reduce their climate impact (Coelho, et al., 2020; Mahmoudi & Parviziomran, 2020).

Choosing products with as little as possible (additional) packaging materials

Similarly, to the previous point, consumers can make a difference by choosing products that do not have unnecessary packaging. This is because the heavier and larger volume of the products, the more transportation it requires which increases CO₂ emissions (Escursel et al., 2021; Honig et al., 2022).

Limiting returns of parcels

Consumers that return their packaging cause additional CO₂ emission (Pålsson et al., 2017; Escursell et al., 2021; Velazques & Chankov, 2019). On average, Dutch citizen return more than other European citizen (DPDgroup, 2018). This causes additional CO₂ emissions due to additional transportation and a loss of resources since a part gets burned afterwards (Thuiswinkel.org, 2021; Statista, 2022).

Being at home for the pick-up

If consumers are not home to receive an at-home delivery, additional transportation is required (Europa.eu, 2020). Therefore, if consumers make sure they are home to receive a parcel this can reduce CO₂ emissions (Van Loon, et al., 2015).

Purchasing in bulk

Purchasing in bulk reduces the relative amount of packaging materials that are required and decreases the amount of transportation. This takes up relatively less space and reduces the number of transportations required (Van Loon, et al., 2015).

Appendix C

Factor Analysis and Scale Construction

Four items of the originally eleven-item scale were excluded from the scale base on a confirmatory factor analysis (see Table 7 for all items). The factor analysis revealed two separate factors. One of the two factors consisted of one variable (i.e. when I deliver my parcel at home, I make sure it can be delivered at the first try) and was excluded from the scale as there was no practical and theoretical reasoning for a one-item scale. In addition, three variables did not meet the requirement of a component loading $>.55$ and were excluded: i) I deliver my next parcel at a delivery point (instead of my home), ii) the next time I order something I think about if I really want it so I don't need to return it and ii) If a sustainable delivery of my parcel will take longer than two working days, I will order somewhere with a faster, but less sustainable delivery (reversed)).

The seven-item SDI-scale was normally distributed, with a skewness = $-.229$ (SE = 0.14), kurtosis = $-.493$ (SE = 0.28) and no univariate outliers. The internal reliability was good (Cronbach's $\alpha = .861$). The convergent validity was moderate strong (when correlated to the option of choosing a reusable delivery packaging) ($r = .471$) (see Table 6 for details of the final scale).

Table 6

Means, standard deviations, component loadings, Cronbach's α when item deleted and correlations for final scale.

Item	<i>M</i>	<i>SD</i>	<i>FL</i>	α	1	2	3	4	5	6
1. If I have the option, I will choose a sustainable mode of transportation for the delivery of my next parcel.	4.13	1.88	.84	.83						
2. If I have the option, I will choose for a sustainable mode of transportation for the delivery of my next parcel, regardless the price.	2.75	1.53	.72	.85	.695					
3. If I have the option, I will choose for a sustainable mode of transportation for the delivery of my next parcel, regardless weather the delivery will take longer than the usual 2 working days.	3.91	1.90	.79	.83	.680	.542				
4. If I have the option, next time I order I will choose products that have as little packaging material as possible.	4.96	1.62	.72	.85	.482	.342	.463			
5. If I have the option, I will make sure more products are delivered in one try to decrease my carbon footprint.	5.14	1.57	.73	.85	.501	.371	.470	.582		
6. If I have the option, I choose for a reusable delivery packaging for the delivery of my next parcel.	4.30	1.99	.77	.84	.550	.413	.467	.502	.517	
7. If, next time I order, I have to return the reusable delivery packaging after delivery to a mailbox of delivery point, I will do so.	4.56	1.95	.63	.86	.366	.345	.415	.360	.330	.548

Note. In this table *FL* stand for factor loading and α stands for α when the item is deleted.

Table 7*Means, standard deviations and component loadings for all items*

Item	Component loading			
	<i>M</i>	<i>SD</i>	Comp. 1	Comp. 2
1. If I have the option, I let my next parcel be delivered at a pick-up point (instead of home).	3.41	1.88	.263	-.546
2. If I choose my next parcel to be delivered at home, I make sure the parcel can get delivered at the first try.	5.67	1.36	.182	.626
3. If I have the option, I will choose a sustainable mode of transportation for the delivery of my next parcel.	4.13	1.88	.811	-.068
4. If I have the option, I will choose for a sustainable mode of transportation for the delivery of my next parcel, regardless the price.	2.75	1.53	.686	-.118
5. If I have the option, I will choose for a sustainable mode of transportation for the delivery of my next parcel, regardless weather the delivery will take longer than the usual 2 working days.	3.91	1.90	.810	-.176
6. If a sustainable delivery takes longer than two working days, I order somewhere where the delivery is less sustainable but faster.	5.32	1.58	.527	-.372
7. If I have the option, next time I order I will choose products that have as little packaging material as possible.	4.96	1.62	.706	.278
8. If I have the option, I will make sure more products are delivered in one try to decrease my carbon footprint.	5.14	1.57	.723	.351
9. If I have the option, I choose for a reusable delivery packaging for the delivery of my next parcel.	4.30	1.99	.738	-.021
10. If, next time I order, I have to return the reusable delivery packaging after delivery to a mailbox of delivery point, I will do so.	4.56	1.95	.628	-.185
11. Next time before I order something I will make sure that I truly want it so I do not have to return anything.	5.58	1.57	.477	.388

Note. Comp. = component.

Appendix D

Webshop Requirements

1. Webshop page (one of four experimental conditions)
 - a. Overview page
 - i. Products are randomized for each participant.
 - ii. Possibility to select multiple of one product.
 - iii. Participant can click on product for product page or can add (one by one) directly to shopping basket.
 - b. Product page
 - i. No zoom functions.
 - ii. Possibility to put one or multiple products in a shopping basket.
 - c. Shopping basket
 - i. Overview of all the products a participant has selected.
 - ii. Possibility to adjust or delete number of products.
 - iii. Possibility to have multiple of one product in shopping basket.
 - iv. Automatically sums total amount of products.
 - v. Maximum of €50, minimum of €20 before placing order → otherwise an error appears.
 - vi. At least one tea required in shopping basket → otherwise an error appears.
 - vii. Participants have to choose whether or not they want a reusable delivery packaging for the delivery of their parcel. → otherwise an error appears.
 - viii. Participant can click on order now and continue to questionnaire to continue to the questionnaire.