



Best practices catalogue of behaviour change techniques to encourage sustainable consumer delivery choices

Supplemental report

Version 1.0

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List of abbreviations

BCT	Behaviour change technique
CBC	Choice-based conjoint analysis
CO ₂	Carbon dioxide
DHL	Dalsey, Hillblom and Lynn
EV	Electric vehicle
GHG	Greenhouse gas

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Administrative information

Basic information on the SuCoLo project and this deliverable:

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Purpose of the document

The purpose of this document is to provide a comprehensive compilation of best practices in behaviour change techniques (BCTs) for promoting sustainable logistics solutions. By exploring both practical applications and experimental research, the document aims to support the SuCoLo project's overarching objective of fostering environmentally conscious consumer behaviour in the context of e-commerce logistics and developing novel BCTs to extend work already done in this area. The catalogue serves as a resource for identifying and implementing effective BCTs that encourage consumers to choose sustainable delivery options, such as cargo bike deliveries, slow delivery modes, and other eco-friendly alternatives. Additionally, this document offers insights into how these strategies were adapted and scaled across various industries and consumer demographics. Through detailed case studies, lessons learned, and actionable recommendations, the catalogue underscores the role of behaviour change techniques in driving sustainable logistics practices and achieving broader environmental goals.

This document precedes the main document of D3.3 *Behaviour change guidebook for sustainable logistics choices* to extend the prior meta-analysis of literature in D3.1 *Scientific publication of reviewed behaviour change techniques for sustainable logistics* to explore a greater number of practical examples of how such BCTs that motivate and incentivize sustainable consumer delivery choices have already taken shape on actual online shopping environments.

Executive Summary

Objective

The catalogue compiles best practices that showcase successful applications of BCTs in encouraging sustainable delivery options. These practices are drawn from both practical implementations on company websites and experimental research. The goal is to provide actionable insights to support the SuCoLo project's development of consumer-facing tools and strategies.

Methodology

The report is based on comprehensive desk research via industry case studies, website evaluations and analysis of academic literature. It identifies 18 best practices, including 13 practical applications and five research studies, focusing on digitally mediated BCTs. Key research criteria include consumer-facing BCTs that encourage sustainable delivery choices, excluding mitigation of product returns.

Case Study Highlights:

- Green eCommerce (Austria): Implemented digital tools and gamified loyalty programs to encourage sustainable delivery.
- FannyFresh (Austria): Integrated CO₂-neutral delivery using predominately cargo bikes as part of its core operations and employed priming BCT mechanisms.
- Vanden Borre (Belgium): Leveraged data-driven tools like SmartDrop to dynamically highlight the most sustainable delivery option based on contextual factors.
- Experimental Studies: Explored nudging techniques such as default options and the optimal level of informational complexity to determine their influence on consumer delivery choices.

Implications for SuCoLo

This catalogue provides a foundation for designing consumer-oriented strategies within SuCoLo (which follows in T3.3 *Inventory of behaviour change strategies for sustainable consumer logistics choice*). By leveraging insights from successful cases and experimental findings, the project can:

- Develop scalable BCT strategies for sustainable logistics decisions.
- Enhance consumer engagement with transparent and impactful BCTs.
- Promote regional and inclusive logistics practices, such as cargo bike deliveries, to further sustainability goals.

The SuCoLo project underscores the potential of behaviour change techniques in fostering environmentally conscious consumer behaviours, setting a precedent for sustainable e-commerce logistics across industries.

1. Best practice case studies

Overview of best practice cases

This document compiles best practice cases in promoting sustainable consumer behaviours via the displaying of sustainable delivery options on online shops (i.e. cargo bike delivery, slow home delivery, EV delivery, etc.). To encourage/incentivise consumers to choose the sustainable form of delivery, behaviour change techniques (BCTs), grounded in the COM-B taxonomy of behaviour change (Michie et al., 2013), are envisaged to induce online shoppers to choose such options. These are divided into BCTs which have already been put into practice in actual online shops (practical applications) or researched in an experimental setting (research applications). The best practices were identified through desk research and website analysis, using keywords such as behaviour change, behaviour change techniques, digital nudging, sustainable delivery options, customer-centric, sustainability nudging and more. A thorough review of academic literature, industry reports, and case studies was conducted to identify effective best practices and strategies, whether the application be practical or research. Analysis of company websites, sustainability reports, and other publicly available resources provided detailed insights into specific business practices and their outcomes. In total, 18 best practices were collected, out of which thirteen are practical cases, mainly company websites, and five journal articles where the topic was examined from a research perspective.

The studies explored how different types of behaviour change techniques (BCTs) can influence consumers to choose more sustainable delivery methods. Experiments demonstrated that providing consumers with information about the environmental impact of delivery options especially could shift preferences towards more sustainable choices. Research papers highlighted the effectiveness of non-financial incentives like social media sharing and the social norms in promoting sustainable delivery choices. Precisely, adding a Facebook share option and providing information on how many other consumers already shared on social media. Information messages about environmental impacts were found to be the most effective BCT, while reversing the order of delivery options had limited effects. Financial incentives, such as charging extra for the least sustainable options, were effective but generally seemed to impact customer satisfaction negatively. Non-financial incentives, like providing sustainability information, also proved to be effective.

Furthermore, the studies found that consumers often lack awareness of the environmental impact of their delivery choices. However, when informed, they generally tend to choose greener options. Green BCTs were nearly as effective as price discounts in changing consumer behaviour. Research showed that when sustainability-related information (e.g., environmental impact, working conditions) is provided, it significantly influences consumer decisions, often on par with price considerations. This highlights the importance of transparency in product and delivery sustainability.

The primary criterion for selecting these best practice cases was their effectiveness in getting perspective online shoppers to choose sustainable delivery options in research applications, and exemplary uses of such BCTs in practical applications already implemented on select webshops. This compilation of best practice cases demonstrates the diverse approaches companies and researchers are taking to promote sustainable consumer behaviours and environmentally friendly business practices. By understanding these successful strategies, other organizations can adopt and tailor these practices to further sustainability goals across various industries.

Research criteria

- Consumer-facing BCTs
- BCTs that are fixated on encouraging sustainable consumer behaviour by means of sustainable delivery choices (not fixated on mitigating returns)
- Digitally mediated BCTs

Table 1 Overview of best practice cases

No	Name	Country	Type	Used technology	Delivery type(s)	Product type(s)	Implemented BCT(s) according to BCT Taxonomy	Link
1	Green eCommerce	Austria	Research application	Prototype webshop	Home delivery (via an EV)	Apparel	Information about social and environmental consequences, Social comparison	https://www.green-e-commerce.at/
2	FannyFresh	Austria	Practical application	Website	Home delivery (Cargo bike)	Food	Information about social and environmental consequences (Cargo bike delivery), Prompts/cues	https://www.fanny-fresh.com/
3	Krusenhof Etteln	Germany	Practical application	Website	Home delivery (Cargo bike)	Food	Information about social and environmental consequences (Cargo bike delivery option), Material incentive (Next day delivery with sustainable option), Prompts/cues	https://www.krusenhof-etteln.de/
4	Pela	United States	Practical application	Website	Home delivery	Phone accessories	Social comparison (“ <i>The average order saves 60 bags</i> ”), Information about social and environmental consequences (“ <i>You are saving the equivalent of X plastic bags</i> ”), Prompts/cues	https://eu.pelacase.com/

5	Agood company	Sweden	Practical application	Website	Home delivery	Miscellaneous	Restructuring the physical environment (eco delivery mode is digital default), Material incentive (regular delivery costs 2€, eco is free), Information about social and environmental consequences	https://www.agood.com/de
6	DM	Germany	Practical application	Website	Home delivery, pick-up station	Drugstore	Information about social and environmental consequences (less CO ²), Restructuring the physical environment (digital default)	https://www.dm.de/
7	ZooPlus	Germany	Practical application	Website	Home delivery	Pet items	Information about social and environmental consequences (better working conditions)	https://www.zooplus.at/
8	H&M Austria	Austria	Practical application	Website	Pick-up station	Apparel	Information about social and environmental consequences (more environmentally friendly transport route)	https://www2.hm.com/de_at/index.html
9	Vanden Borre	Belgium	Practical application	Website	Home delivery, Pick up in store/Pick-up point	Technology	Information about social and environmental consequences (Icon next to more sustainable delivery option)	https://www.vandenborre.be/
10	Towards more sustainable online	Netherlands	Research application	Custom online store environment	Home delivery, pick-up station	Miscellaneous	Information about social and environmental consequences (less CO ²),	https://doi.org/10.1016/j.clrc.2023.100135

	consumption: The impact of default and informational nudging on consumers' choice of delivery mode						Restructuring the physical environment (digital default)	
11	Sharing is caring: How non-financial incentives drive sustainable e-commerce delivery	Belgium	Research application	A survey imitating a shopping basket, developed in the survey software Qualtrics	Home delivery	Apparel (shoes)	Information about social and environmental consequences (number of goods vehicles on the road and kilometres driven per goods vehicle), Restructuring the physical environment (sustainable option first), Identification of self as role model (Facebook share button next to sustainable delivery option), Social comparison (Message shared more than 1000 times)	https://doi.org/10.1016/j.trd.2021.102794
12	Should I wait or should I go? Encouraging customers to	Netherlands	Research application	A survey imitating a shopping basket	Home delivery, Pick-up station	Apparel (shoes)	Information about social and environmental consequences (reduce the impact of transportation on the environment),	https://doi.org/10.1016/j.retrec.2023.101388

	make the more sustainable delivery choice						Material incentive (charging 2,95€ extra for less sustainable option)	
13	Leveraging sustainable supply chain information to alter last-mile delivery consumption: A social exchange perspective	United States of America	Research application	Two behavioural experiments developed in online retail buying contexts	Home delivery	Apparel (sweatshirt)	Information about social and environmental consequences (CO ² emissions and environmental information), Social comparison (50 % of shoppers are now choosing standard ground delivery) Material incentive (\$1 discount when choosing sustainable option)	https://doi.org/10.1016/j.spc.2022.09.014
14	Providing sustainability information in shopping situations contributes to sustainable decision making: An empirical study with choice-based conjoint analyses	Germany	Research application	Two choice-based conjoint tasks (CBC): one for grocery shopping and one for online shopping	Home delivery, Pick-up station, Pick-up at the store	Food, apparel	Information about social and environmental consequences (environmental consequences, working conditions) Material incentive (return cost, shipping costs more at home delivery)	https://doi.org/10.1016/j.jretconser.2018.03.018

15	Karwei	Netherlands	Practical application	Website	Home delivery, Store delivery	Home decor	Information about social and environmental consequences (Sustainable icon), Material incentive (shipping free for in store delivery), Restructuring the physical environment (sustainable option manually ticked)	https://www.karwei.nl/
16	Douglas.nl	Netherlands	Practical application	Website	Home delivery, Store delivery, Service point	Cosmetics	Information about social and environmental consequences (Sustainable choice next to service point option), material incentive (shipping free for in store delivery)	https://www.douglas.nl/nl
17	Timberland	Germany/Austria (Universal)	Practical application	Website	Home delivery, Store delivery, Pick-up station	Apparel	Information about social and environmental consequences (Sustainable icon), material incentive (shipping free for in-store delivery)	https://www.timberland.at/de-at

1.1 Best practice case 1: Green eCommerce: Promoting climate-friendly online deliveries through user-oriented interventions in existing online shops

Key facts

- **Initiator:** Austrian Research Promotion Agency
- **Application:** Research application
- **BCT type:** Information about social and environmental consequences, social comparison
- **Promoted delivery mode:** Home delivery (via EV)
- **Product type:** Apparel
- **Used technology:** Prototype webshop
- **Status:** Completed
- **Location/country:** Austria
- **Link:** <https://www.green-ecommerce.at/>

Short description

The overarching goal of “Green eCommerce” is the conception, development and evaluation of innovative technological, behaviour-based and logistical add-ons. These expand existing online shops with the aim of avoiding, shifting and optimizing traffic on the last mile.

With the help of the combination of a gamified loyalty system that rewards users for high compliance, for example, persuasive design principles that are characterized by visually highlighting regional products with short delivery routes or bulk orders, as well as AI-supported fitting tools and chat bots that automatically measure clothing sizes and point out environmentally friendly delivery options, customers are encouraged to shop more consciously - in the sense of more sustainable freight transport. This customer-centred approach starts directly with the loading and delivery process in order to preventively minimize returns and multiple delivery attempts, bundle orders and give preference to direct delivery of regional products and climate-friendly means of transport (Wernbacher, et al., 2023). The project was funded by the Federal Ministry for Climate Protection as part of the research program Mobility of the Future and is managed by the Austrian Research Promotion Agency.

The result is modular add-ons for expanding existing online shops, which are based on:

- logistical (e.g. e-transportation, bulk orders, direct deliveries from regional producers),
- technology-driven (e.g. AI-supported chatbots and fitting tools for virtual fitting) and
- behavioural-based interventions (e.g. gamified loyalty system to underline “climate-friendly” or desired behaviour & to reward with discount systems; persuasive design and nudging strategies to convey subtle hints/information on the voluntary promotion of sustainable shipping and delivery options) (Wernbacher, et al., 2023).

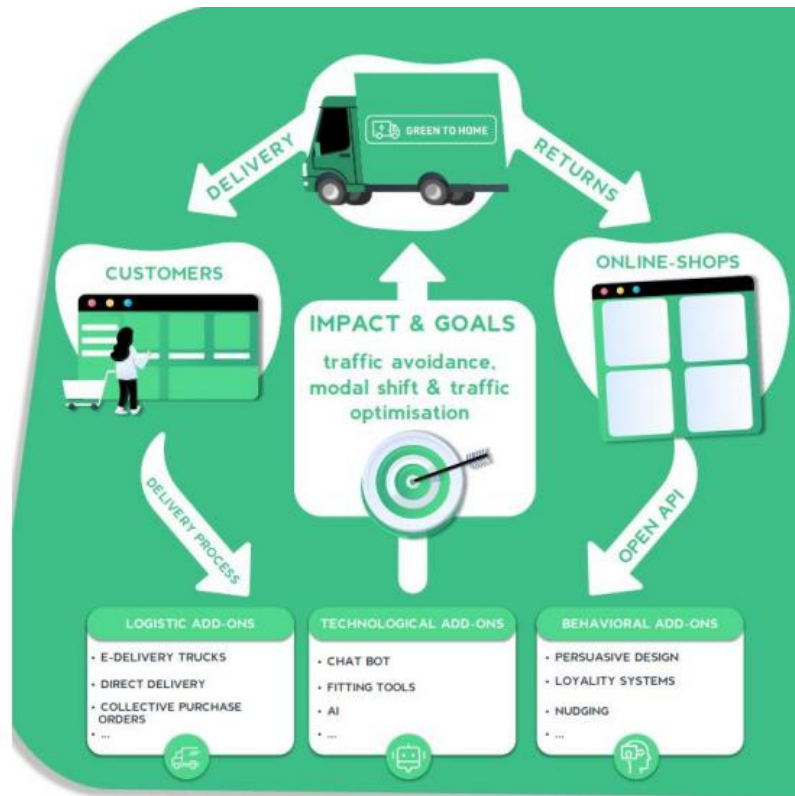


Figure 1 An overview of the project objectives (<https://www.green-e-commerce.at/>)

BCT type

The BCTs used in this project include:

- Information about social and environmental consequences
- Restructuring the physical environment
- Social comparison
- Material incentive

The add-ons implemented (mentioned above) each represent a BCT imperative in enhancing customers to make sustainable purchasing decisions (digital nudging for sustainable delivery via EVs). One of the complementary logistical add-ons was the pre-selection of e-truck delivery, in addition to a sustainable icon above the delivery option. Therefore, providing information about the environmental consequences of the action and setting the desired delivery mode as the digital default (Wernbacher, et al., 2023).

Moreover, among the behavioural add-ons was an information box with a compelling text, nudging consumers to consider the time lost when returning a product, in order to mitigate returns. Precisely, 32 minutes is lost on average due to a misguided order resulting in a return, which coerces consumers to rethink. Thus, alluding to something negative if an unwanted behaviour is performed (Wernbacher, et al., 2023).

Lastly, a similar example was presented, however with a different BCT, namely social comparison. Consumers were met with an information box stating how many other customers averted from returning items, highlighting the importance of reading product descriptions and using digital sizing manuals, thereby behaving sustainably (Wernbacher, et al., 2023).

Lessons learned/implications for SuCoLo

Although the latter two BCTs presented (BCTs with informational messages and social comparison messages to mitigate returns) are not within the scope of SuCoLo as the focus on consumers choosing sustainable delivery options only, the outlined modalities are relevant for SuCoLo, i.e., using BCTs that quantify in terms of time/minutes and involving social comparison aspects, which can be extrapolated to the case of delivery choice. Additionally, the informational message that gives a specific brand to the sustainable delivery option “*Green to Home*” as well as the illustration carries relevance to SuCoLo.

1.2 Best practice case 2: FannyFresh

Key facts

- **Initiator:** FannyFresh
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences, prompts/cues
- **Promoted delivery mode:** Home delivery via cargo bike (or EV in rural areas)
- **Product type:** Food
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** Austria
- **Link:** <https://www.fanny-fresh.com/>

Short description

FannyFresh is a local Salzburg business selling regional products and offers fully CO₂-neutral delivery within Salzburg using e-cargo bikes and they plan to expand this service to nearby communities as demand grows. In order to reach rural areas, they have delivery via an EV (About us: Fanny Fresh, n.d.).

BCT type

The BCTs apparent on FannyFresh`s website is:

- Providing information about social and environmental consequences of performing a behaviour
- Prompts/cues

It is clearly displayed in the figures below how the brand continues to influence consumers to make sustainable choices when making their purchase (i.e., by regarding their delivery as CO₂-neutral). In doing so, the consumer feels they contributed to environmental health via e-cargo bike/EV delivery; hence, the BCT regarding providing information about environmental consequences of an action is accurate in this context.

NEU: Ab sofort beliefern wir auch die Salzburger Umlandgemeinden (mit dem Elektroauto) und können eure Bestellungen nach Rücksprache annehmen. Gerne könnt ihr euren Bedarf in unserem Feedbackformular deponieren. Wir freuen uns über eure Nachricht.

Liefergebiet Stadt:
Gnigl, Langwied, Heuberg*, Schallmoos, Parsch, Aigen, Salzburg-Süd, Nonntal, Leopoldskron-Moos, Gneis, Morzg, Altstadt*, Maxglan, Riedenburg, Kasern, Itzling, Neustadt, Elisabeth-Vorstadt, Liefering, Lehen, Mülln, Taxham

Liefergebiet Salzburger Umlandgemeinden:
Anif, Berghheim, Elixhausen, Elsbethen, Grödig, Hallwang, Wals-Siezenheim

Bestellschluss für eine Lieferung in der Folgewoche ist jeweils **donnerstags**.

*Da wir vorwiegend mit dem Lastenrad ausliefern, behalten wir uns vor abgelegene bzw. steile Zufahrten auf den Stadtbergen vorab zu prüfen und je nach Gegebenheit mit dem Elektroauto zu beliefern.

Figure 2 FannyFresh's detailed delivery description (<https://www.fanny-fresh.com/liefergebiet/>)

Additionally, priming is used, as even before the customer is selecting their preferred delivery option, the website homepage and lower banner aims to influence the customer's decision even before the delivery options are presented (albeit there is only one delivery choice displayed on the website – however, this mechanism still holds water).

Unsere Vision

Unsere Vision ist es, mit
kompromissloser
Regionalität unserer
Produkte, CO₂-neutralem
Lieferservice und unserem
Zero Waste Konzept, einen
Beitrag für eine lebenswerte
Zukunft zu leisten.

Figure 3 FannyFresh's priming mechanism displaying their CO₂-neutral shipping on their website (<https://www.fanny-fresh.com/>)



Figure 4 FannyFresh's priming mechanism displaying their CO₂-neutral shipping on their website (<https://www.fanny-fresh.com/>)

Results & evaluation

Upon an interview with FannyFresh, it is reported that their experience with cargo bike delivery service and their resulting BCTs to promote them have been very positive. In fact, some customers only order because of their proprietary cargo bike delivery. Having cargo bike delivery has also resulted in faster deliveries with less traffic encountered. Additionally, the cargo bike delivery presents a unique selling proposition.

Lessons learned/implications for SuCoLo

FannyFresh is an exemplary case of a locally owned online shop selling regional products (a focus webshop type in SuCoLo) that already integrates cargo bike delivery within their operations – which is still an exception compared to most other online shops. Further, unlike some online shops who offer cargo bike delivery via the use of secondary bicycle couriers, FannyFresh vertically integrates them into their operations. Although FannyFresh does not have BCTs during the delivery selection, their priming mechanisms beforehand on their homepage are prime examples of how priming BCTs could be integrated onto online shops that would like to showcase sustainable consumerism aspects before the customer is directed to the delivery section of the customer journey. Furthermore, BCTs in this case in the last stages of the customer journey (product confirmation and check out) would not make sense, as cargo bike/EV delivery is their only delivery option offered; in this vein, BCTs in this case are not exactly necessitated because there is no choice between delivery options. Lastly, their validation that these initiatives have made a positive change in their shop's operations are a testament to how such solutions can generate a positive effect not only for the environment, but for online shops as well.

1.3 Best practice case 3: Krusenhof Etteln

Key facts

- **Initiator:** Krusenhof Etteln
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences, material incentive, prompts/cues
- **Promoted delivery mode:** Home delivery via cargo bike
- **Product type:** Food
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** Germany
- **Link:** <https://www.krusenhof-etteln.de/>

Short description

Krusenhof Etteln is a solidarity agriculture group located in a small community called Etteln and surrounding areas. Currently, they deliver organic poultry and fish, among other farm products. In their online shop, they have the option of cargo bike delivery to nearby areas. This is with a bicycle courier service Pakumo. The local supplier Pakumo, the first city logistics service provider in Paderborn, is the first city logistics service provider on cargo bikes and thus ensures a greatly reduced ecological footprint in the delivery process. This pilot project can be seen as the launch of a low-emission, quiet and space-saving delivery service in the Paderborn core area and neighbouring towns (Krusenhof Etteln - Website, n.d.).

Feinste Bio-Produkte per Lastenrad

1. Unsere Naturland-zertifizierten Bio-Produkte im Shop bestellen
2. regionaler Transportdienstleister Pakumo liefert per Lastenrad
3. Recyclebare Öko-Verpackung von Landpack zur Entsorgung unter Altpapier und Kompost

... versandkostenfrei in ganz Paderborn!

Besuche jetzt unseren Onlineshop unter www.krusenhof-etteln.de/Bio-Shop

Figure 5 Advertisement of Krusenhof Etteln's cargo bike delivery service (<https://www.krusenhof-etteln.de/>)

BCT type

There are three BCTs apparent on Krusenhof's website, namely:

- Information about social and environmental consequences
- Material incentive
- Prompts/cues

The website clearly states its initiatives towards a sustainable future and also at the checkout for consumers to be informed about the impact they are making by purchasing from the brand. Specifically, highlighting cargo bike shipping, resulting in a sustainable delivery mode. The prompting/cuing is conducted on the homepage as it is sharing its commitment to the environment via use of a regional cargo bike courier even before the customer selects and buys the items. Moreover, when choosing a more sustainable option, such as a cargo bike delivery, not only is it free (compared to the standard DHL shipping at 6.99 euros), but the customer is guaranteed a next day delivery. Additionally, the delivery nudge is a green box, signifying a eco-friendly quality.

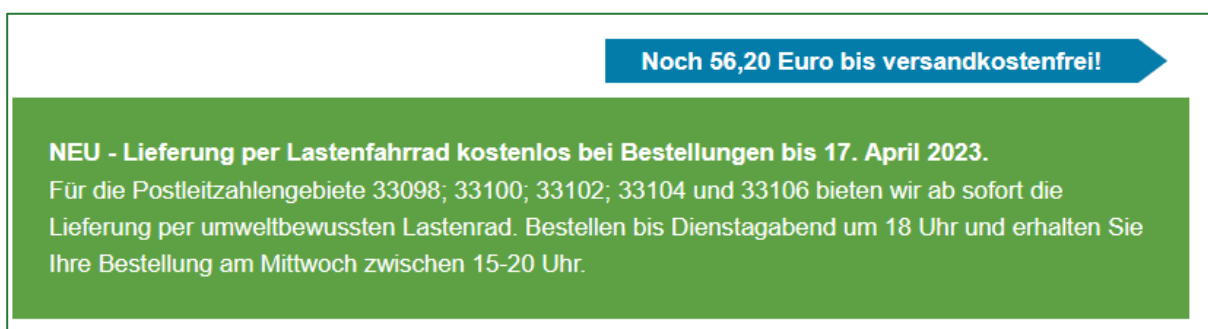


Figure 6 Screenshot of information box during checkout (<https://www.krusenhof-etteln.de/>)

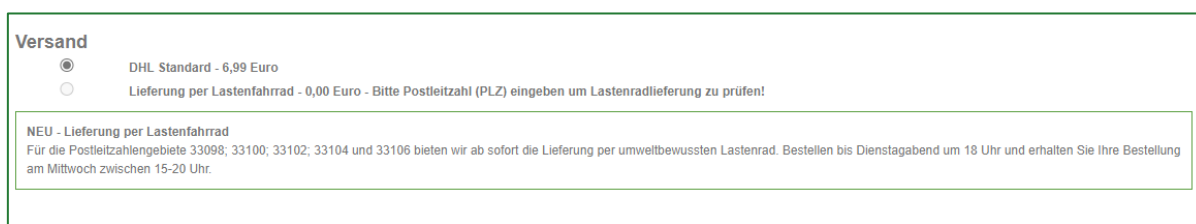



Figure 7 Screenshot of information box during checkout (<https://www.krusenhof-etteln.de/>)

Results & evaluation

Partnering with Pakumo, Paderborn's first logistics provider to use only cargo bikes, they have significantly reduced the environmental impact of their delivery process. This initiative marks the beginning of a low-emission, quiet, and space-saving delivery service in Paderborn and surrounding areas. Deliveries are scheduled weekly on Wednesdays, with orders required by Tuesday evening for next-day delivery (Krusenhof Etteln - Website, n.d.). Furthermore, their website first advertised a cargo bike delivery trial for a limited time – until 17 April 2023. However, cargo bike delivery is still a part of their operations (as of September 2024). So, when

evaluating their initiative to use cargo bike delivery, once a temporary initiative has led to a long-term operations change – which is a testament to their success.

Neu im Bio-Shop: Lieferung per Lastenrad




Wir setzen ganz auf Nachhaltigkeit, und das bedeutet für uns, dass nicht nur unsere Produkte Bio sind: Ab sofort können Sie sich Ihre Bestellung auch per Lastenrad liefern lassen.

Auf der Suche nach einem nachhaltigen Transportdienstleister ist für uns Pakumo aus Paderborn die erste Wahl gewesen. Durch den starken Fokus auf Nachhaltigkeit in seinem Betrieb sollte auch die Lieferlösung zu unserem Naturland-zertifizierten Familienbetrieb passen.

Dabei setzt der lokale Anbieter Pakumo als erster Citylogistik Dienstleister in Paderborn ausschließlich auf Lastenräder und sorgt somit für einen stark reduzierten ökologischen Fußabdruck im Auslieferungsprozess. Zusammen mit dem innovativen Stroh und Hanf Isolierverpackungen von Landpack ist der Tiefkühltransport ganzheitlich nachhaltig gedacht.

Figure 8 Sustainable initiatives of Krusenhof Etteln (<https://www.krusenhof-etteln.de/>)

Neu: Kostenlose Lieferung im Raum Paderborn bis 17. April 2023



Für die Postleitzahlgebiete 33098; 33100; 33102; 33104 und 33106 bieten wir ab sofort die kostenlose Lieferung per umweltbewussten Lastenrad.... [Weiterlesen](#)

Feinste Bio-Produkte per Lastenrad

- 100% Bio Naturland zertifizierte Bio-Produkte im Shop bestellen
- regelmäßiger Transportdienstleister Pakumo liefert per Lastenrad
- Bestellbares über Bestellung von Landpack zur Beförderung von Waren und Personen

...verspüren Sie es in jeder Lieferung

Bestellen Sie jetzt online Bio-Produkte im Shop und lassen Sie sie per Lastenrad liefern!

Figure 9 Original advertisement for cargo bike delivery for a limited time only (<https://www.krusenhof-etteln.de/>)

Lessons learned/implications for SuCoLo

Krusenhof Etteln is a locally owned shop with regional products, which is a focus area of the SuCoLo project’s target online shops the developed BCTs aim to impact most. Additionally, similar to FannyFresh, their integration of cargo bike delivery is a notable, as most shops still have not yet implemented this. However, unlike FannyFresh, which has vertically integrated cargo bike delivery and they do it themselves, Krusenhof Etteln has outsourced the deliveries to an external company (Pakumo) for them. Additionally, their material incentive with free and fast next-day delivery with cargo bikes, compared to pricier and longer standard delivery with DHL presents a unique selling proposition (USP) for customers to choose local cargo bike delivery. Additionally, Krusenhof’s display of information about the environmental consequences is framed quite simplistically, with the labels such as “environmentally friendly” and with green labelling to signify eco-friendliness. Lastly, their prompting/cuing mechanisms on the homepage before customers look through the products and check out is in line with other screened online shops who are already advertising sustainable delivery even in the very first stages of the customer journey.

1.4 Best practice case 4: Pela

Key facts

- **Initiator:** Pela
- **Application:** Practical application
- **BCT type:** Social comparison, Information about social and environmental consequences, Prompts/cues
- **Promoted delivery mode:** Home delivery
- **Product type:** Phone accessories
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** United States
- **Link:** <https://eu.pelacase.com/>

Short description

This initiative sells phone cases with new materials to find an alternative to plastic for everyday products. Pela's mission is to normalize sustainable products begins with items used daily. They have made much of their supply chain more environmentally aware from different facets (Our Story, n.d.).

BCT type

The BCTs used in the case of Pela are:

- Information about social and environmental consequences
- Social comparison
- Prompts/cues

On the website of Pela there is no specific eco-delivery; however, the brand still focuses on nudging the consumer to make sustainable purchases. When checking out, the website displays the number of plastic bags the specific purchase will save, informing the consumer of their choices in an easy-to-understand manner. Moreover, it also provides the number of plastic bags saved by the average consumer on a scale displaying how far away the current order is from that number, highlighting social comparison aspects as the consumer checks out. It urges the consumer to make a bigger purchase while also protecting the environment, as the bigger the purchase, the greater number of plastic bags are saved (logic: with more products added to the cart, the less the environmental externalities, measuring them on a per-product level). Additionally, their sustainability characteristics are highlighted on the homepage, even before the last steps of the customer journey. This prompting/cuing aspect is in line with other screened websites.

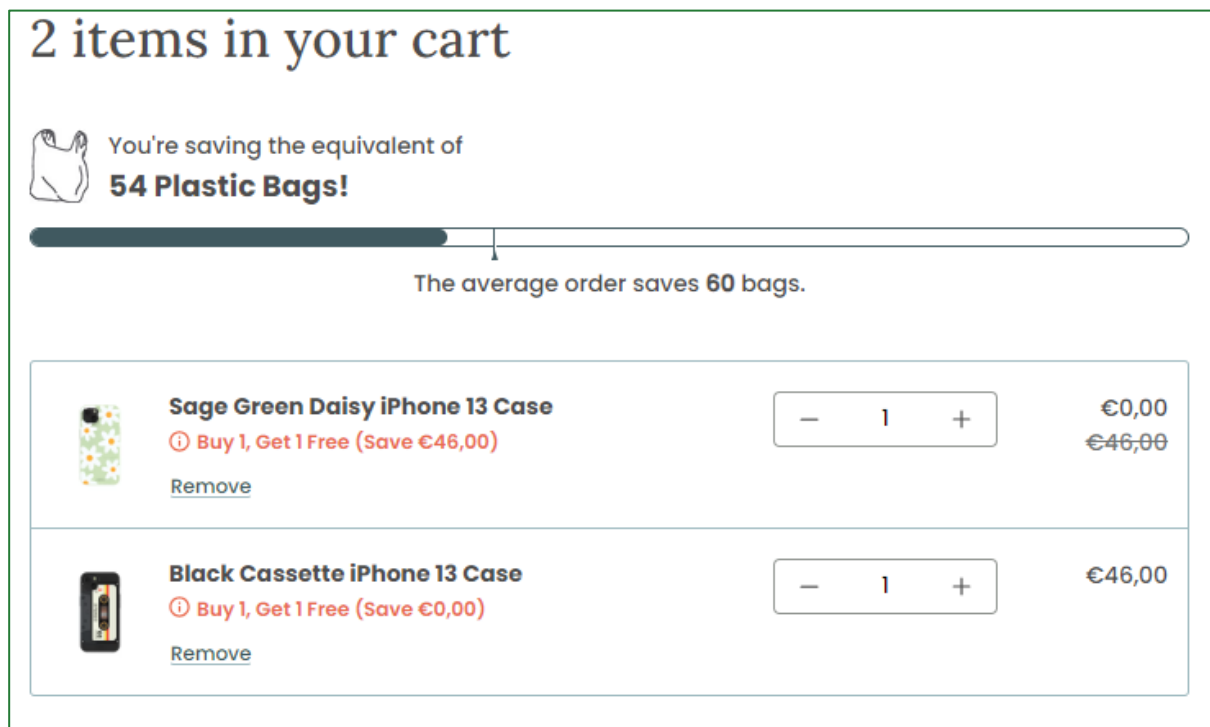


Figure 10 Screenshot of check out box on Pela's website (<https://eu.pelacase.com/>)

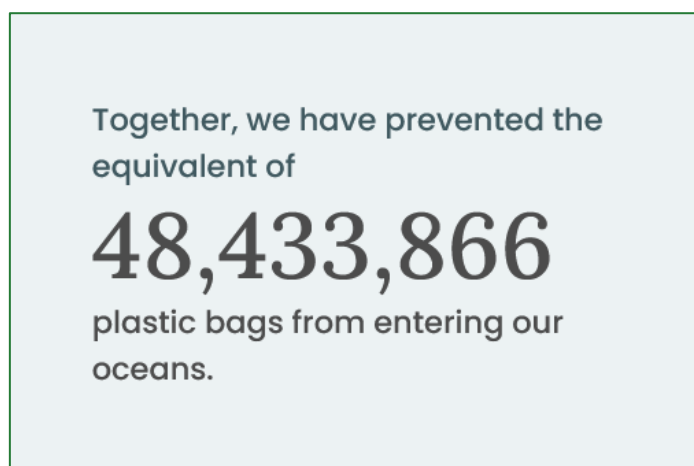


Figure 11 Screenshot of Pela's plastic bags quantification (homepage, <https://eu.pelacase.com/>)

Lessons learned/implications for SuCoLo

Pela's application of information messages in terms of "plastic bags saved" is a novel way to quantify environmental savings in a visible and easy-to-grasp manner. Additionally, the displaying of the average customer's environmental savings in terms of "plastic bags saved" is novel and presents an interesting social comparison modality which could be applied in the case of the SuCoLo project's experiment. And although these BCTs were used to attribute to product characteristics (sustainability of the products themselves), these modalities can be extrapolated to describe delivery choice characteristics. Additionally, their prompting/cuing mechanisms are in line with other screened shops, which can be extrapolated to the SuCoLo webshop prototype.

1.5 Best practice case 5: Agood company

Key facts

- **Initiator:** Agood company
- **Application:** Practical application
- **BCT type:** Restructuring the physical environment, material incentive, information about social and environmental consequences
- **Promoted delivery mode:** Home delivery
- **Product type:** Miscellaneous
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** Sweden
- **Link:** <https://www.agood.com/de>

Short description

Agood Company, founded in Stockholm, Sweden exists to create and sustainable everyday products. Moreover, a good company carefully assesses the potential environmental impact of all their operations and consistently compensate for emissions from shipping and travel (Who We Are, 2021). They encourage customers to engage with and understand the exact processes behind their products and provide detailed accounts of the environmental footprint of each product, including carbon emissions from both production and shipping (Who We Are, 2021).

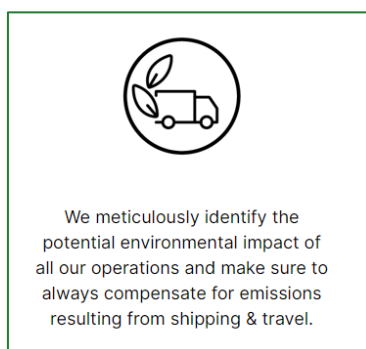


Figure 12 Screenshot of a good company website regarding their sustainable initiatives (<https://www.agood.com/de>)

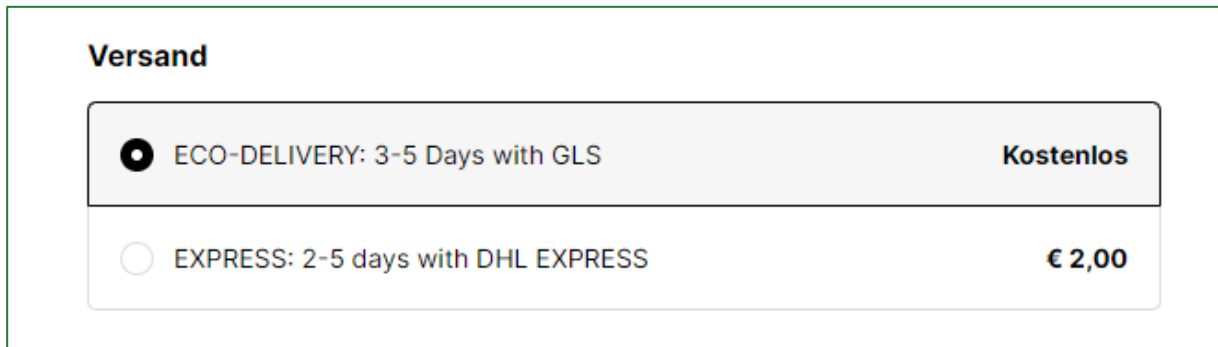
BCT type

The BCT types that can be found on the brand`s website include:

- Information about social and environmental consequences
- Restructuring the physical environment
- Material incentive

When one orders from Agood Company, eco-delivery (the preferred delivery type) is the pre-selected default option. Furthermore, its labelling of one delivery mode over the other would

relate to an informational nudge. Also, the eco-delivery option is also free. However, if a consumer desires a faster delivery, the course of action costs money, hence a material incentive to choose the free option.



Versand	
<input checked="" type="radio"/> ECO-DELIVERY: 3-5 Days with GLS	Kostenlos
<input type="radio"/> EXPRESS: 2-5 days with DHL EXPRESS	€ 2,00

Figure 13 Screenshot of delivery options on A Good Company (<https://www.agood.com/de>)

Lessons learned/implications for SuCoLo

As we have also seen with shops such as Krushenhof, Agood Company's ascribing of the eco-delivery option to be free is an insightful way of promoting the sustainable option of the two. Such material incentives can be carried out in the SuCoLo webshop prototype. Additionally, their digital default architecture and eco-labelling is in line with other best practices and will be given great consideration in the SuCoLo webshop prototype.

1.6 Best practice case 6: DM

Key facts

- **Initiator:** DM
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences, restructuring the physical environment
- **Promoted delivery mode:** Home delivery, pick-up station
- **Product type:** Drugstore
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** Germany
- **Link:** <https://www.dm.de/>

Short description

Across DM stores and dm.de, they offer a diverse array of products, totalling over 12,500 different items. DM strives to diminish emissions associated with their operations, particularly by outfitting their facilities with climate- and resource-saving technologies since 2012. They exclusively utilize electricity from renewable sources, reflecting their commitment to operating under environmentally friendly conditions (Nachhaltigkeit im Unternehmen, n.d.). This is also includes introducing eco-friendly deliver modalities (in this case, DHL GoGreen Plus).

BCT type

The types of BCTs on the German DM website include:

- Information about social and environmental consequences
- Restructuring the physical environment

As seen on the figure below, when a consumer is checking out, DM's pre-selected and first option is DHL Go Green Plus, with a clear leaf sign, stating that it is a sustainable and preferred option. Moreover, at the bottom is a small text provided on the positive consequences of the action, encouraging the consumer to be environmentally conscious. Additionally, although not the pre-selected delivery option, delivery via a DHL packstation (pick-up station) is presented as a green delivery option.

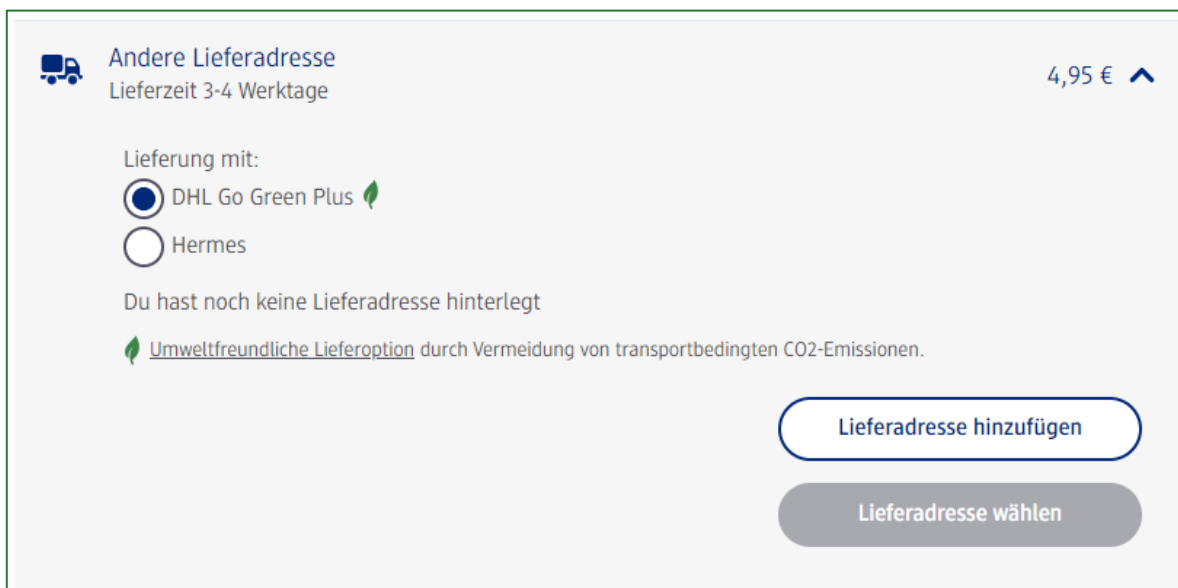


Figure 14 Screenshot of DM's home delivery BCT (<https://www.dm.de/>)

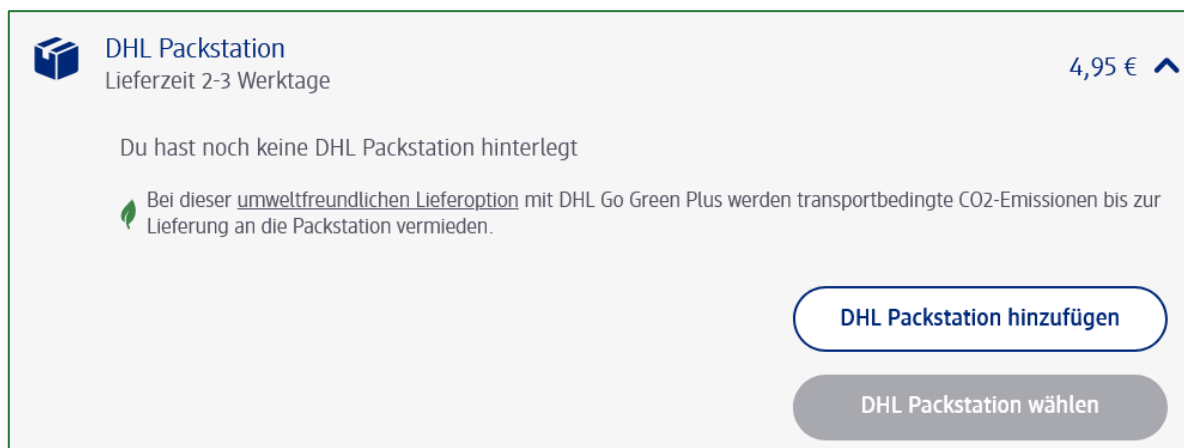


Figure 15 Screenshot of DM's pick-up station BCT (<https://www.dm.de/>)

Lessons learned/implications for SuCoLo

The case of DM presents something which has not been seen with most other screened online shops; namely, they present more than one delivery option as sustainable (in this case: two options). However, one delivery option (eco home delivery) seemed to be the preferred option over the pick-up station option as it was the first and default option. In further development of such nudges, it is notable to consider the fact that more than one preferred delivery option can be presented and give the customers more agency to choose their most desired delivery option of the eco-friendly choices. Additionally, a simple green leaf and a short text describing that it is an environmentally friendly delivery option is an aesthetically pleasing way of presenting the options.

1.7 Best practice case 7: ZooPlus

Key facts

- **Initiator:** ZooPlus
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences
- **Promoted delivery mode:** Home delivery
- **Product type:** Pet items
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** Germany
- **Link:** <https://www.zooplus.at/>

Short description

Founded in 1999, ZooPlus is a pet shop with a catalogue of over 9,000 items (Zooplus, n.d.). Compared to other screened online shops, they have introduced a novel way of framing no-rush delivery in the final section of the customer journey.

BCT type

The BCT type accurate in the context of ZooPlus`s website is information about social and environmental consequences, which in this case alludes to the working conditions of delivery divers – by selecting the additional option, the consumers would contribute to better working conditions for delivery drivers with no-rush delivery. Moreover, added was a green paw icon and a green box around it, possibly alluding to the sustainable aspects in addition to the better working conditions by selecting that option. More specifically, the consumer chooses to wait a couple of days additionally for the package, resulting in less stress for the drivers in the last mile.



Figure 16 Screenshot of ZooPlus's delivery options on their website (<https://www.zooplus.at/>)

Results & evaluation

At ZooPlus, they employ various strategies to reduce CO₂ emissions. With a dense network of warehouse locations across Europe, they rely on short routes to minimize emissions in transport logistics. They increasingly collaborate with climate-neutral logistics partners who use electric vehicles for delivery (Unser Engagement für die Umwelt, n.d.). However, no direct results from the displaying of these options could be found.

Lessons learned/implications for SuCoLo

In the case of ZooPlus, their take on communicating information about the social consequences of choosing no-rush home delivery is an insightful way to frame it, which has not been seen with other best practice cases. While still subtly underlining that it is the eco-friendly way of delivery with a green box and green paw, the prime message of delivery worker conditions brings the attention to other aspects of no-rush delivery which may be overlooked. In this case, such methods warrant a closer eye in SuCoLo.

1.8 Best practice case 8: H&M Austria

Key facts

- **Initiator:** H&M Austria
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences
- **Promoted delivery mode:** Pick-up station
- **Product type:** Apparel
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** Austria
- **Link:** https://www2.hm.com/de_at/index.html

Short description

Since 1947, H&M is a global fashion and design company, operating over 4,000 stores in more than 75 markets and has online sales in 60 markets (About Us, n.d.). H&M Group's vision for sustainability is to lead the transition towards a circular fashion industry with net-zero climate impact, encompassing the entire value chain (About Us, n.d.). This includes promoting eco-friendly delivery options.


BCT type


The type of BCT to be seen in the case of H&M Germany is information about social and environmental consequences; namely, adding a delivery option where it is clearly stated that it is an environmentally safe option (in this case: pick-up stations). It is offered as the second choice, and all shipping options are the same cost and longevity in shipping time. However, this part of the customer journey, not only is the standard delivery option pre-selected, but the choice is not even presented unless one additionally clicks on the “edit” option in the delivery section. Here, customers may rush through the checkout process without even considering the other delivery options.


Lieferung

Identisch mit meiner Rechnungsadresse

Wie möchtest du dein Paket erhalten?

 **Standardlieferung**
5,75 € · 3-4 Werktage

 **Umweltfreundlicherer Transportweg - Abholung Postfiliale/Abholstation**
5,75 € · 3-4 Werktage

 **Abholung im Geschäft**
5,75 € · 3-4 Werktage


 **Abholung in der Postfiliale/Abholstation**
5,75 € · 3-4 Werktage

Figure 17 Screenshot of H&M Germany shipping options

Results & evaluation

At H&M Group, their goal is to reduce absolute greenhouse gas (GHG) emissions across their value chain by 56% by 2030 and by at least 90% by 2040, using 2019 as a baseline (Climate, n.d.). Their lessened CO₂ impact of transport, currently taking 4% of their total emissions, had decreased more than 25 percent from 2019 to 2023 (see figure below). However, the direct impact of the BCT itself is not weighted.

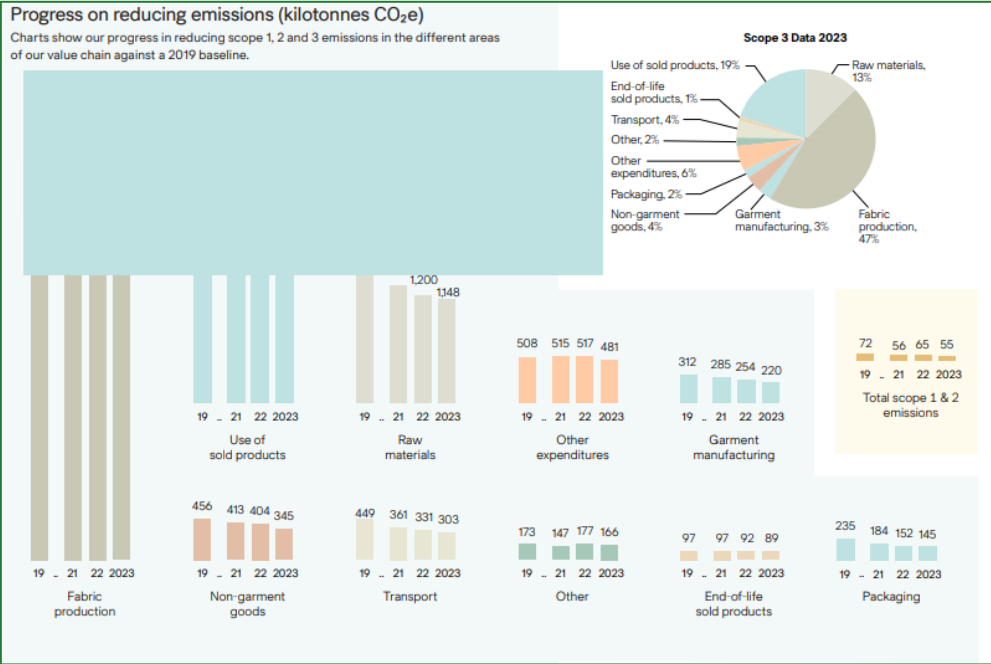


Figure 18 Screenshot of H&M Group’s progress on reducing emissions in their Climate Transition Plan (Climate, n.d.)

Lessons learned/implications for SuCoLo

Most of the practical applications of the listed best practices in this document are smaller, regional companies. Here, it is insightful to see that sustainable delivery and their corresponding BCTs are being implemented in larger online shops. Their informational BCT is in line with other best practices.

1.9 Best practice case 9: Vanden Borre

Key facts

- **Initiator:** Vanden Borre
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences
- **Promoted delivery mode:** Home delivery, in-store pick-up, pick-up station
- **Product type:** Technology
- **Used technology:** Website
- **Status:** Ongoing
- **Location/country:** Belgium
- **Link:** <https://www.vandenborre.be/>

Short description

Vanden Borre is a leading Belgian retailer specializing in audio, TVs, multimedia, and household appliances, and is part of the larger Fnac Darty group, one of Europe's major distributors in this sector (Who are we? Vanden Borre, n.d.). Vanden Borre was the first Belgian retailer to implement SmartDrop, which is an application that measures the external costs of various delivery options. SmartDrop was made by the Vrije Universiteit Brussel and Comeos. By implementing their calculation tool, details such as delivery vehicle age, operator differentiation, traffic conditions, zip code and more are considered in order to scientifically back a certain delivery choice over another in real time based on precise contexts. Furthermore, if online shoppers choose the delivery option that SmartDrop considers to be the most environmentally friendly, the social costs related with their delivery will reduce by 21% (Dendooven, 2023).

BCT type


The types of BCTs on the Vanden Borre website include:

- Information about social and environmental consequences


When checking out, the customer can choose the delivery date in the case of home delivery, which is an anomaly compared to other screened online shops. First, you give your zip code, then the SmartDrop plug-in pre-selects the most environmentally friendly delivery option (between in-store pick-up, pick-up station, and home delivery – depending on a multitude of indicators). Concerning the BCT type, information about the social and environmental consequences is present, as certain delivery options are labelled as “the least burdensome option for your environment”. No price differentials between the options are present, as it has to do with the monetary amount of your cart. Below, you can see the most sustainable delivery option differentials depending on different zip codes in Belgium: 1000, 5000, and 3920.

Kies je leveringsmethode

📍 Kies je leveringsmethode rond 1000 - [Wijzig](#)



AFHALING
(Gratis)



LEVERING
(Gratis)

Afhalen bij Vanden Borre zonder voorschot
 Brussel-Elsene na 30 min.
[Wijzig](#)

bpost afhaalpunt
[Selecteer een afhaalpunt](#)



 De minst belastende optie voor je omgeving [?](#)


Figure 19 In-store pick-up being the most sustainable option for zip code 1000 (Belgium) (<https://www.vandenborre.be/>)

Kies je leveringsmethode

📍 Kies je leveringsmethode rond 5000 - [Wijzig](#)



AFHALING
(Gratis)



LEVERING
(Gratis)

Afhalen bij Vanden Borre zonder voorschot
 Bois-de-Villers na 30 min.
[Wijzig](#)

bpost afhaalpunt
[Selecteer een afhaalpunt](#)



 De minst belastende optie voor je omgeving [?](#)


Figure 20 Pick-up station being the most sustainable option for zip code 5000 (Belgium) (<https://www.vandenborre.be/>)

Kies je leveringsmethode

📍 Kies je leveringsmethode rond 3920 - [Wijzig](#)



AFHALING
(Gratis)



LEVERING
(Gratis)

Kies een datum

Morgen	Zo	Ma	Di	Wo	Do	Vr	Za	Zo	Ma	Di	Wo	Do	Vr	Za	Zo	Ma	I	
<	31	1	2	3	4	5	6	7	8	10 sep.	11	12	13	14	15	16	17	>

Tussen 8 u. - 18 u. | Gratis


 De minst belastende optie voor je omgeving [?](#)

Figure 21 Home delivery being the most sustainable option for zip code 3920 (Belgium) (<https://www.vandenborre.be/>)

Results & evaluation

Although direct impacts cannot be found from Vanden Borre's integrating of SmartDrop technology to direct customers to choose the most sustainable delivery mode, according to SmartDrop, customers choosing the highlighted option results in a 21% reduction in external costs from their delivery. The SmartDrop plug-in will be integrated on more Belgian webshops in the future, such as Decathlon (Dendooven, 2023).

Lessons learned/implications for SuCoLo

Vanden Borre's choice of delivery date in the case of home delivery is a novel aspect in this last stage of the customer journey that has seldom been seen with other screened webshops. This can give the customer a feeling of autonomy over their delivery. Additionally, the data-based decision-making process that ultimately chooses the most sustainable delivery option is a novel case and is a testament to the fact that true sustainability of delivery is contextually-based and not one size fits all in this case. The screening of the most sustainable delivery option via the input of your zip code is also novel. The informational nudge of "the least burdensome option for your environment" is also an interesting way of communicating the delivery's sustainability, compared to other webshops that simply labelled it is "eco-friendly", "sustainable", etc. that takes into account a wide variety of externalities. Although Vanden Borre's approach is too complex to be implemented in SuCoLo, it is an advanced measure of measuring and displaying sustainable delivery options thus far.

1.10 Best practice case 10: Towards more sustainable online consumption: The impact of default and informational nudging on consumers' choice of delivery mode

Key facts

- **Initiator:** University of Vienna & Radboud University
- **Application:** Research application
- **BCT type:** Information about social and environmental consequences, restructuring the physical environment
- **Promoted delivery mode:** Pick-up station
- **Product type:** Miscellaneous
- **Used technology:** Custom online store environment
- **Status:** Completed
- **Location/country:** Netherlands
- **Link:** <https://doi.org/10.1016/j.clrc.2023.100135>

Short description

The rising CO₂ emissions from e-commerce deliveries represent a significant environmental challenge. If half of all consumers opted for pick-up point delivery instead of home delivery, CO₂ emissions from e-commerce could be significantly reduced. This study explored (a) whether nudging could encourage consumers to choose pick-up point delivery as a more sustainable option, and (b) which type of nudging would be most effective. A randomized controlled trial (RCT) was conducted with a representative sample of the Dutch population (N = 1213). Participants selected a product and completed the check-out process in an online store setting, choosing between more and less sustainable delivery options, with their choice directly affecting the delivery method of a real gift (Nijssen et al., 2023).

Four different nudging conditions were compared: a default nudge, where the most sustainable option (delivery to a pick-up point) was pre-selected, and three decision-information nudges that displayed CO₂ emissions for each delivery option. These nudges varied in complexity: high complexity (emissions in grams of CO₂ for each option), medium complexity (percentage of CO₂ reduction for the most sustainable option), and low complexity (a green leaf next to the most sustainable option). Compared to the control group, the default nudge was most effective in steering participants towards the most sustainable delivery choice, followed by the medium- and low-complexity informational nudges. Interestingly, the high-complexity informational nudge did not steer participants towards the most sustainable option but rather away from the two most polluting options, potentially resulting in greater greenhouse gas (GHG) reductions than the other conditions (Nijssen et al., 2023).

BCT type

The BCT types in this study include:

- Information about social and environmental consequences
- Restructuring the physical environment

As mentioned above, a real-life online shopping experience was developed for participants, where they had to fill in their information and choose a delivery option. They were presented with the following options: same-day delivery, delivery tomorrow in a specific timeframe, delivery tomorrow all day, or a pick-up point. Furthermore, all delivery options were provided at no cost to prevent the introduction of potential incentive biases in the study. However, there were specific intervention treatments applied; specifically, informational and default nudges. Within the informational nudges, the CO₂ impact of the delivery mode was presented in a certain way, varying in level of complexity within each nudge. The first option merely included a green leaf next to the most sustainable delivery option, followed by a percentage presented next to the more complex nudge. Lastly, the most complex nudge indicated specific amounts of CO₂ in grams for each delivery option. Conversely, in the default nudging the most sustainable option was chosen automatically for the participant. Moreover, a green leaf was added next to the option, strengthening its impact (Nijssen et al., 2023).



Informational nudges (in order of complexity)			b
1	2	3	
<ul style="list-style-type: none"> <input type="radio"/> Same-day delivery (order before 16:00) <input type="radio"/> Delivered tomorrow <input type="radio"/> Delivered tomorrow evening <input type="radio"/> Delivered to pick-up point  	<ul style="list-style-type: none"> <input type="radio"/> Same-day delivery (order before 16:00) <input type="radio"/> Delivered tomorrow <input type="radio"/> Delivered tomorrow evening <input type="radio"/> Delivered to pick-up point 20% less CO₂ consumption 	<ul style="list-style-type: none"> <input type="radio"/> Same-day delivery (order before 16:00) 630 grams CO₂ <input type="radio"/> Delivered tomorrow 418 grams CO₂ <input type="radio"/> Delivered tomorrow evening 520 grams CO₂ <input type="radio"/> Delivered to pick-up point 400 grams CO₂ 	
Default nudge		Control	
<ul style="list-style-type: none"> <input type="radio"/> Same-day delivery (order before 16:00) <input type="radio"/> Delivered tomorrow <input type="radio"/> Delivered tomorrow evening <input checked="" type="radio"/> Delivered to pick-up point  		<ul style="list-style-type: none"> <input type="radio"/> Same-day delivery (order before 16:00) <input type="radio"/> Delivered tomorrow <input type="radio"/> Delivered tomorrow evening <input type="radio"/> Delivered to pick-up point 	

Figure 22 An overview of all nudging implemented in the study (Nijssen et al., 2023)

Results & evaluation

The results provide clear evidence of the overall impact of nudging interventions on pro-environmental decision-making. The default nudge was particularly effective, significantly increasing the likelihood of consumers choosing a more sustainable delivery method by 5.39 times. Informational nudges also had a notable effect, with the increase in the number of

sustainable delivery choices ranging from 2.45 to 3.07 across different conditions. Interestingly, the significant effect of the most complex informational nudge (Condition IN-3) was not due to an increase in sustainable delivery choices but rather a decrease in the least sustainable delivery methods (Nijssen et al., 2023).

These findings illustrate that nudging interventions can effectively alter consumers' online decision-making, but they also present a paradox. While the default nudge was most effective in increasing the likelihood of selecting the more sustainable delivery option (i.e., the pick-up point), the fully transparent informational nudge was most effective in decreasing the likelihood of choosing the least sustainable delivery options (i.e., same-day or evening delivery). The potential CO₂ reduction achieved by steering consumers away from these most environmentally harmful delivery methods might be significantly larger than the CO₂ reduction obtained by nudging consumers toward the more sustainable choice. In terms of actual CO₂ impact, the fully transparent nudge might have a greater effect than the default nudge (Nijssen et al., 2023).

An exploratory analysis further revealed main effects of consumers' environmental attitudes, the frequency with which they buy products online, and the importance they place on the speed and accuracy of delivery. Importantly, the design of the study allowed for a direct comparison of various behavioural interventions (Nijssen et al., 2023).

Lessons learned/implications for SuCoLo

As BCTs are developed within the context of the SuCoLo project, the level of complexity is a worthwhile aspect of displaying informational nudges about environmental consequences which warrants further exploration. Here, a dearth of studies has touched upon this complexity aspect. A careful balance is necessitated in order to not cognitively overload the online shopper, while also providing insightful information about the delivery options that can steer them to make an informed choice. This study can conclude that implementing a complex nudge can generally be an effective way to steer behaviour, and not have the cognitively overloading effect. The positive effect of the digital default nudge (restructuring the physical environment) is also in line with other applications mentioned in this document.

1.11 Best practice case 11: Sharing is caring: How non-financial incentives drive sustainable e-commerce delivery

Key facts

- **Initiator:** Univ Gustav Eiffel & Vrije Universiteit Brussel
- **Application:** Research application
- **BCT type:** Information about social and environmental consequences, restructuring the physical environment, identification of self as role model, social comparison
- **Promoted delivery mode:** Home delivery
- **Product type:** Clothing
- **Used technology:** Survey imitating a shopping basket
- **Status:** Completed
- **Location/country:** Belgium
- **Link:** <https://doi.org/10.1016/j.trd.2021.102794>

Short description

As online shopping continues to rise, the urgency to mitigate the environmental impact of e-commerce deliveries grows. While research proposes various initiatives for retailers and logistics service providers, involving consumers is crucial. This study explores how to promote sustainable decision-making among consumers on the web-shop's check-out page using non-financial incentives. An online experiment with Belgian consumers was conducted to evaluate and compare the effects of four BCTs: (1) information, (2) options order, (3) social media share, and (4) social norm (Rai et al. 2021).

The experiment revealed that providing information on the ecological footprint of delivery options is the most influential incentive. Both social media shares and social norms also positively impact sustainable decision-making, whereas altering the order of delivery options had minimal effects. This research underscores the significant role of consumer behaviour in advancing sustainability and encourages further investigation into this area (Rai et al. 2021).

BCT type

The study focused on four non-financial incentives to compare and evaluate, which translated to the following BCTs:

- Information about social and environmental consequences
- Restructuring the physical environment
- Identification of self as role model
- Social comparison

In the context of this research, information about environmental consequences meant the addition of a “did you know” box, alluding to the more sustainable option, describing that longer delivery terms reduce the number of goods vehicles on the road and the number of kilometres driven per delivery vehicle. Furthermore, the study aimed at investigating the influence of the order of delivery options, thus playing the most sustainable option first. Moreover, as the

research set social media sharing option as one of the dependent variables, a Facebook share button was added next to the most sustainable option. Lastly, to examine social norms, a message has been added to the previously mentioned Facebook share option, stating that it had already been shared more than one thousand times by others (Rai et al. 2021).

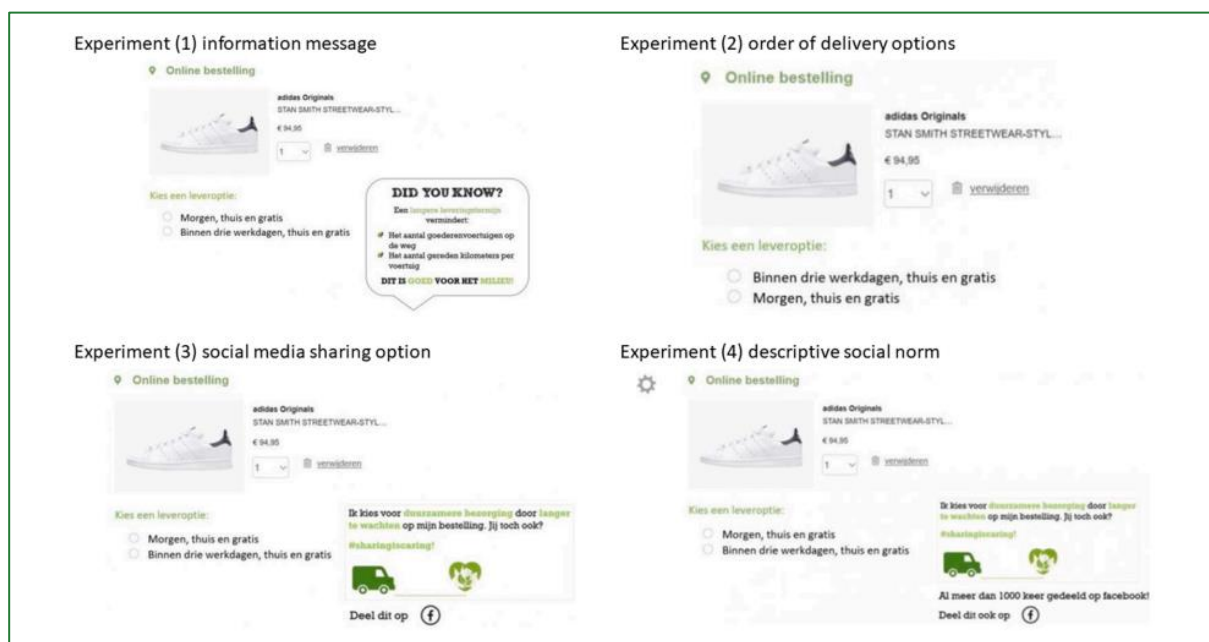


Figure 23 An overview of all four tested non-financial incentives (Buldeo Rai et al., 2021)

Results & evaluation

The aim of this study is to determine whether non-financial incentives can prompt consumers to opt for more sustainable delivery choices, such as slower delivery instead of standard next-day delivery. Here, the price of the delivery was intentionally left out. The findings indicate that more respondents chose standard next-day delivery over slower options in the four experimental groups. These results suggest that (1) informational messages, (3) social media sharing options, and (4) descriptive social norms can influence over half of consumers to select a more sustainable delivery option, whereas (2) changing the order of delivery options does not have the same effect (Rai et al. 2021).

Through an online experiment with Dutch-speaking online consumers in Belgium, the study found that positively framed informational messages about the environmental impact of delivery options can persuade more than half of consumers to make sustainable choices on the web-shop check-out page. The study also confirmed the positive impact of adding a Facebook button for sharing consumers' sustainable decisions and indicating that many consumers had already made similar choices. In contrast, while reversing the order of delivery options did encourage more respondents to opt for slower delivery compared to those without an incentive, a greater number of respondents still chose fast delivery. The study concludes that providing information "at the source" can transform neutrality into action. Furthermore, implementing non-financial incentives can promote sustainable consumer behaviour over time, not only when shopping at other online retailers but also through social influence and the establishment of social norms. Unlike financial incentives, which involve additional costs for either consumers (e.g., fast delivery at a surcharge) or retailers (e.g., slow delivery at a

discount), the study's recommendations come at minimal costs. Low-impact and frequently enacted behaviours, such as choosing e-commerce delivery options, represent the majority of sustainable consumer behaviour research, potentially because they hold the greatest promise for actual environmental change (Rai et al. 2021).

The most effective nudges were: (1) the combination of information about social and environmental consequences (sustainability label) and identification of self as role model (social media sharing), and (2) Social comparison (others' choices to share on social media).

Lessons learned/implications for SuCoLo

The novel aspect of this study is that it tested four different BCTs which are prominent thus far when applied to the case of sustainable delivery options. Interestingly, all four nudges had a positive effect at least to some extent to get consumers to choose the sustainable mode; however, the insightful piece is the great proportion of the sample which chose the sustainable delivery mode for three out of the four options (information about social and environmental consequences, social comparison and identification of self as role model – where over half of the sample chose the preferred delivery option). Another novel aspect of the study was testing the combination of nudges to see if the two together had any added effect – in fact, a combination of an informational nudge and a social comparison nudge was seen to have one of the greatest effects.

1.12 Best practice case 12: Should I wait or should I go? Encouraging customers to make the more sustainable delivery choice

Key facts

- **Initiator:** Breda University of Applied Sciences
- **Application:** Research application
- **BCT type:** Information about social and environmental consequences, material incentive
- **Promoted delivery mode:** Home delivery, pick-up station
- **Product type:** Apparel
- **Used technology:** A survey imitating a shopping basket
- **Status:** Completed
- **Location/country:** Netherlands
- **Link:** <https://doi.org/10.1016/j.retrec.2023.101388>

Short description

The surge in e-commerce has increased the demand for parcel deliveries, raising concerns about the cost and environmental impact of last-mile delivery. Customers accustomed to next-day free delivery can significantly contribute by opting for more sustainable delivery methods. Retailers and logistic service providers could encourage customers to wait for their delivery or collect their parcels from designated collection-and-delivery points. This study aimed to investigate how customers (the parcel recipients) can be motivated to choose more sustainable delivery options and how these choices impact their satisfaction (Kokkinou et al. 2024).

Using two scenario-based experiments, the study found that customers can be guided towards more sustainable last-mile delivery choices through both financial and non-financial incentives. Financial incentives, such as a surcharge for the least sustainable option, proved highly effective in extrinsically motivating customers to choose a more sustainable option, although this had a negative effect on their satisfaction. The findings offer valuable insights for retailers on incorporating sustainable delivery options at the checkout and inform urban planning and utilization of urban space for e-commerce activities, as both parcel lockers and pick-up points require appropriate urban space allocation (Kokkinou et al. 2024).

BCT type

The two BCTs apparent in this study are:

- Information about social and environmental consequences
- Material incentives

The study conducted two experiments, each regarding choosing between two delivery options, a sustainable and a next day delivery. The first survey included waiting longer for the parcel, while the second survey's contrasting option was picking up from a parcel locker or pick-up location. The reason for the two surveys was the likelihood of the two sustainable options having an influence on how each one is perceived by the participants.

When presented with the product and taken to check out, participants were offered a choice between two delivery options. For the more sustainable option, a positive message was

curated, highlighting the impact of transformation on the environment and agreeing to combine shipments. The same message was provided for next day delivery; however, no combined shipments were possible having chosen that option. Moreover, the study included an additional charge for next day delivery, thus introducing a material incentive (Kokkinou et al. 2024).

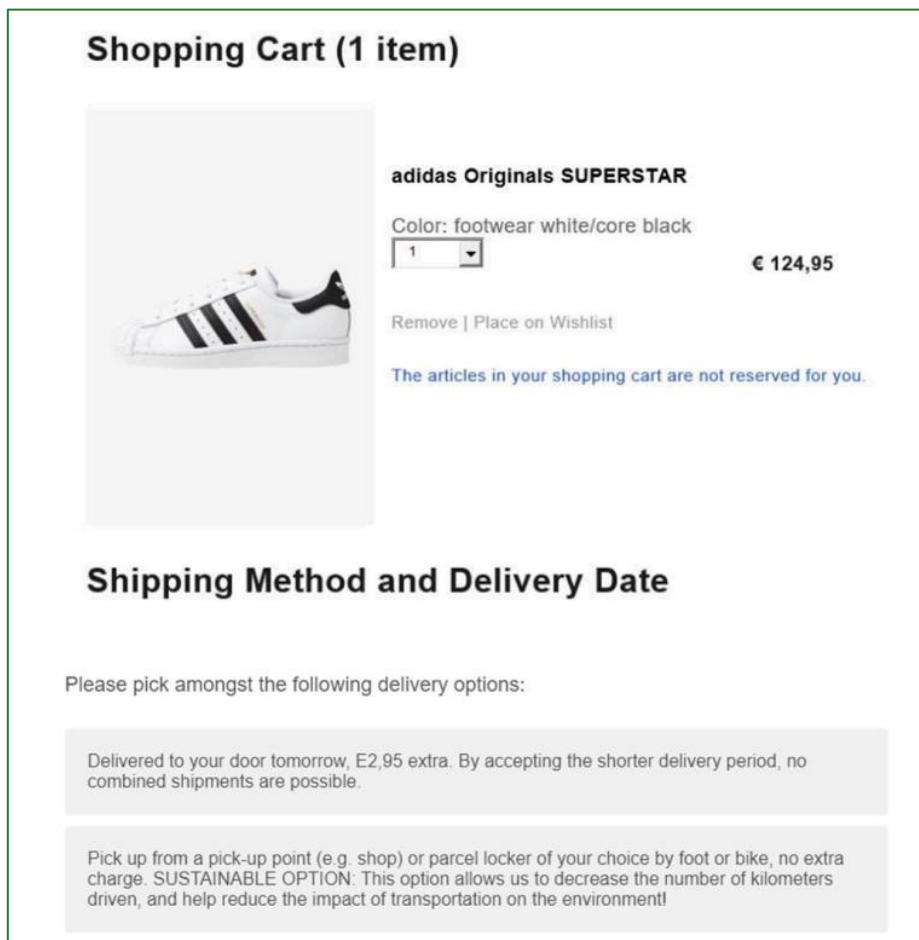


Figure 24 Screenshot of the study's imitative shopping cart (Kokkinou et al., 2024)

Results & evaluation

In the study, two delivery options were examined to enhance delivery efficiency: making customers wait up to three days for their parcel and requiring them to collect it from a parcel locker. Consistent with previous findings emphasizing price sensitivity in customer decision-making between delivery options, charging for next-day delivery was the most effective strategy to encourage customers to opt for the more sustainable delivery option. Customers showed an 18-fold increase in willingness to wait for delivery and a 3.3-fold increase in willingness to pick up their parcel themselves when faced with a next-day delivery surcharge for home delivery. While financial incentives proved effective, they also led to a small yet significant decrease in customer satisfaction with the delivery options, especially pronounced when the alternative was parcel locker pickup, which demands additional time and effort from customers. Providing sustainability information influenced customers to choose the more sustainable delivery option when waiting was the alternative. However, this information did not

similarly influence customers opting to pick up their parcel from a locker, where intrinsic environmental motivation played a more pivotal role (Kokkinou et al. 2024).

These findings underscore the dual role of differential pricing in steering consumer behaviour towards sustainability, despite potential impacts on customer satisfaction, and highlight the nuanced influence of environmental attitudes on decision-making in different delivery contexts. (Kokkinou et al. 2024).

Lessons learned/implications for SuCoLo

This study highlights the great impact that differential pricing of the different delivery options can have whether consumers end up choosing the desired delivery mode. In terms of the SuCoLo webshop prototype, this modality could be an insightful angle to further research. This study also brings light to the fact that extrinsic motivators (i.e., prices) also play an important role in their decision making – not merely only intrinsic motivators.

1.13 Best practice case 13: Leveraging sustainable supply chain information to alter last-mile delivery consumption: A social exchange perspective

Key facts

- **Initiator:** University of Arkansas & Miami University
- **Application:** Research application
- **BCT type:** Information about social and environmental consequences (CO₂ emissions and environmental information), Social comparison (50 % of shoppers are now choosing standard ground delivery) Material incentive (\$1 discount when choosing sustainable option)
- **Promoted delivery mode:** Home delivery
- **Product type:** Apparel
- **Used technology:** Two behavioural experiments developed in online retail buying contexts
- **Status:** Completed
- **Location/country:** United States
- **Link:** <https://doi.org/10.1016/j.spc.2022.09.014>

Short description

The study investigates how sharing sustainability information regarding last-mile delivery options influences consumer behaviour. Conducted within a simulated online shopping environment, participants were presented with a choice between expedited shipment and no-rush home delivery. Findings indicate that disclosing emissions and environmental impacts of delivery options can effectively shift consumer preferences towards lower emissions choices. This effect mirrors the influence of traditional price discounts on consumer decision-making. The study suggests that retailers can mitigate distribution costs and carbon emissions without substantial operational changes or financial investments by educating consumers about the environmental implications of their last-mile delivery decisions (Thomas, Ueltschy Murfield, & Ellram, 2022).

BCT type

As mentioned above, this study used behavioural experiments as their research method, where participants were directed to choose between delivery methods regarding the purchase of a sweatshirt. The BCTs included in the experiments are:

- Information about social and environmental consequences
- Social comparison
- Material incentive

The study used different scenarios out of which one was presented to each participant, where the environmental impact and carbon emissions were stated. In the first experiment, participants were met with a statement regarding how the option can significantly reduce one's environmental impact, in addition to adding lower pollution to the more sustainable option. In experiment two, with the same carbon emission statement, the sustainable delivery choice stated how many other shoppers are choosing that option. Finally, in the third experiment, in addition to information about sustainable impact, a \$1 discount was offered to those choosing the more sustainable option (Thomas, Ueltschy Murfield, & Ellram, 2022).

Table 1
Experimental treatment conditions summary.

	Experiment #1		Experiment #2		Experiment #3	
DV choices & control	Standard ground no-rush delivery (5-7 days) Free shipping	Expedited air rushed delivery (1-2 days)	Standard ground no-rush delivery (5-7 days) Free shipping	Expedited air rushed delivery (1-2 Days)	Standard ground no-rush delivery (5-7 days) Free shipping	Expedited air rushed delivery (1-2 days)
IV 1 no treatment	No information provided		No information provided		No information provided	
IV 1 treatment	"By choosing standard ground shipping you can significantly reduce your personal impact on the environment."		"50 % of shoppers are now choosing standard ground delivery in order to significantly reduce the impact on the environment."		"By choosing standard ground shipping you can significantly reduce your personal impact on the environment."	
IV 2 no treatment	No information provided		No information provided		No information provided	
IV 2 treatment	"100 g of CO ₂ emissions (lower pollution)"	"400 g of CO ₂ emissions (higher pollution)"	"Lower CO ₂ emissions"	"Higher CO ₂ emissions"	"If you choose standard ground delivery, then you will immediately receive a \$1 discount off this order."	

Figure 25 Screenshot of the three experiments and nudges used (Thomas, Ueltschy Murfield & Ellram, 2022)

Results & evaluation

The study on consumers' green purchasing behaviour shifts the focus to logistics services rather than product qualities. It reveals that many e-commerce customers initially overlook environmental sustainability when choosing last-mile delivery options. However, when provided with essential supply chain information, consumers revise their cost-benefit calculations and typically opt for greener, slower shipments. The findings underscore the swift evolution of exchange decisions with the introduction of informative nudges, which promptly influence consumer behaviour by enhancing knowledge. While long-term changes in attribute preferences or new alternatives may affect exchange decisions, our research highlights the immediate impact of informational nudges. Experiments 1 and 2 corroborate that non-economic factors significantly shape exchange dynamics. Experiment 3 further illustrates that environmental considerations in delivery choices not only achieve statistical significance but also carry substantial practical implications. Specifically, the study demonstrates that strategically placed green nudges can influence exchange relationship formation nearly as profoundly as price discounts, indicating a growing recognition of social and psychological factors alongside economic criteria in consumer decision-making (Thomas, Ueltschy Murfield, & Ellram, 2022).

Lessons learned/implications for SuCoLo

The fact that green BCTs (information about social and environmental consequences, social comparison) were comparably effective to price discounts (material incentives) aligns with other literature which state the same sentiment. Furthermore, retailers can take advantage of this fact and not have to resort to price discounts (i.e., lose profit) to incentivise and motivate sustainable consumer delivery choices.

1.14 Best practice case 14: Providing sustainability information in shopping situations contributes to sustainable decision making: An empirical study with choice-based conjoint analyses

Key facts

- **Initiator:** University of Duisburg-Essen, Erwin L. Hahn Institute for Magnetic Resonance Imaging
- **Application:** Research application
- **BCT type:** Information about social and environmental consequences (environmental consequences, working conditions), Material incentive (return cost, shipping costs more at home delivery)
- **Promoted delivery mode:** Home delivery, Pick-up station, Pick-up at the store
- **Product type:** Food, apparel
- **Used technology:** two choice-based conjoint tasks (CBC), one for grocery shopping and one for online shopping
- **Status:** Completed
- **Location/country:** Germany
- **Link:** <https://doi.org/10.1016/j.jretconser.2018.03.018>

Short description

This study employed choice-based conjoint tasks to simulate purchasing scenarios. It explored the influence of personality traits such as materialism and delay discounting on decision-making processes. The findings underscore the significant impact of sustainability information on consumer choices. Specifically, higher levels of delay discounting and materialism were associated with less sustainable decision-making. The study highlights the potential for suppliers to enhance sustainable development by transparently providing consumers with clear sustainability information (Stöckigt, Schiebener, & Brand, 2018). It was not specifically focused on BCTs, but included some examples, nevertheless.

BCT type

The BCT types in this study include:

- Information about social and environmental consequences (regarding environmental Impact and working conditions)
- Material incentive (return cost, shipping costs more at home delivery)

The study employed a two choice-based conjoint task, where participants are met with multiple choice scenarios that differ in the quality of different characteristics. The two categories presented in the surveys were food and fashion. The food choice-based scenario consisted of five attributes, while the fashion one consisted of seven. The participants were instructed to choose one out of the three options, following that a new scenario was presented, with a different attribute combination. For the CBC Food, twenty scenarios were generated, for the CBC Fashion, 28 scenarios. CBC Food consisted of attributes such as Price, Origin, Availability, Environmental Impact and Working conditions. Similarly, for the CBC Fashion scenarios, the attributes included Shipping costs, Speed, time and point of delivery,

Environmental impact, working conditions and return costs. The point of delivery attribute referred to the choice of delivery, whether the consumer gets the package delivered to their home, to a collection point or in store. The environmental impact was labelled with a dark cloud icon, which aimed at finding out how important sustainable shipping methods are to consumers. Moreover, as seen in the figures below, the sustainable option is less costly than home delivery. Furthermore, the cost of return if the consumer is not satisfied is additional payment in all options but the sustainable one, where it is free of charge. Additionally, the survey highlighted the working conditions at stores and delivery companies (Stöckigt, Schiebener, & Brand, 2018).

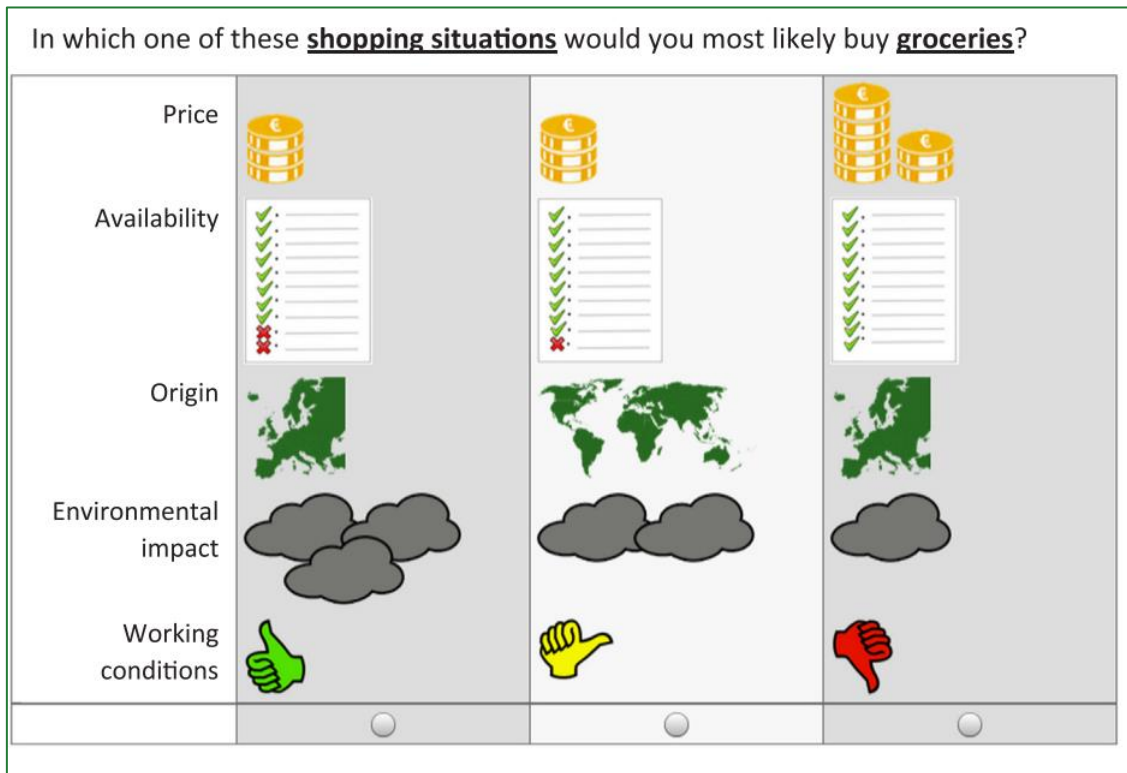


Figure 26 Screenshot of the CBC Food scenario (Stöckigt, Schiebener & Brand, 2018)

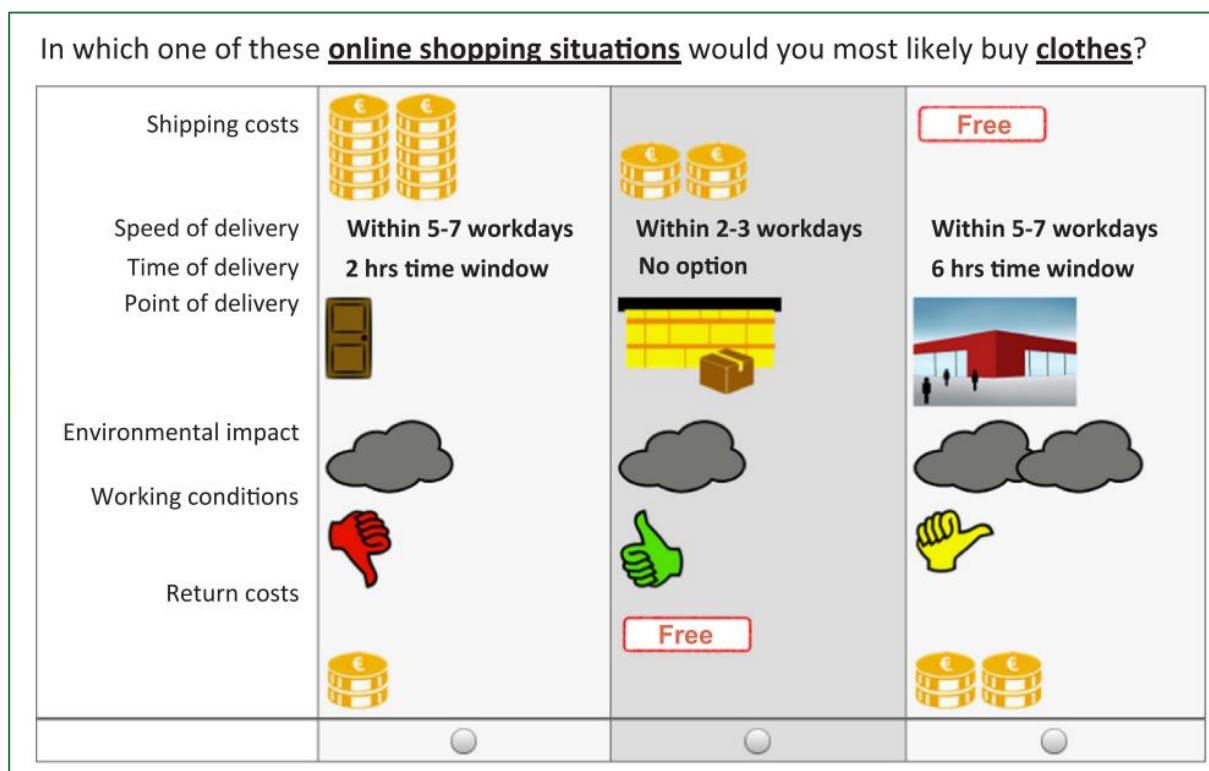


Figure 27 Screenshot of the CBC apparel scenario (Stöckigt, Schiebener & Brand, 2018)

Results & evaluation

This study explored the broad topic of sustainability within the contexts of online shopping deliveries and grocery shopping. It examined implicit measures of sustainability awareness by assessing the relative importance of products' sustainability-related attributes in a choice-based conjoint (CBC) analysis and sought to explain individual differences using previously proposed trait variables. The results indicate that when specific information, such as a grocery product's environmental impact or the working conditions of its delivery, is available, sustainability-related attributes gain higher importance in decision-making compared to most other attributes. This suggests that consumers weigh sustainability-related attributes nearly as much as price, even though price typically has a strong signalling effect in conjoint tasks. However, this effect is influenced by various factors, such as consumers' knowledge about sustainability and the type of product. For instance, differences were observed within the same product type, where consumers were more willing to pay a premium for organic options for vice foods compared to virtue foods. This points to the potential for influencing consumer buying decisions through the provision of sustainability information both in-store and online (Stöckigt, Schiebener, & Brand, 2018).

In summary, the study found that high delay discounting (preferring smaller, sooner rewards over larger, later rewards) and tendencies toward materialism are detrimental to adopting a sustainable lifestyle. Conversely, traits like conscientiousness and particularly openness are beneficial for sustainability awareness in shopping contexts (Stöckigt, Schiebener, & Brand, 2018).

Lessons learned/implications for SuCoLo

The fact that the researchers tested the respondents' levels of materialism and delay discounting on decision-making processes underscores a novel approach of looking at user traits on this topic, as to our knowledge, no other relevant study has tested these aspects. Additionally, exploring this topic in a CBC analysis demonstrates a method that has seldom been used, and can help pinpoint the exact attributes that are most/least important to the respondent. Such a study warrants further exploration in forthcoming SuCoLo project works.

1.15 Best Practice case 15: Karwei

Key facts

- **Initiator:** Karwei
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences (Sustainable icon), Material incentive (shipping free for in-store delivery), Restructuring the physical environment (sustainable option manually ticked)
- **Promoted delivery mode:** Home delivery, Store delivery
- **Product type:** Home decor
- **Used technology:** Website
- **Status:** Completed
- **Location/country:** Netherlands
- **Link:** <https://www.karwei.nl/>

Short description

Karwei is a hardware store in the Netherlands, providing goods ranging from raw materials to furniture. They have 130 stores over the country and an online shop with delivery and in-store collection options (About us: Karwei, n.d.).

BCT type

The BCT types in the case of Karwei were information about social and environmental consequences, as during the customer journey and choosing a delivery option, the consumer is presented a green leaf next to the more sustainable option. Moreover, when choosing a delivery option, the more sustainable choice is automatically ticked as a default option.

Figure 28 Screenshot of Karwei's delivery options at checkout (<https://www.karwei.nl/>)

Results & evaluation

Karwei focuses on circular entrepreneurship, emphasizing the importance of making sustainable choices that prioritize reuse. Their efforts include promoting maintenance, repair, and reuse, and integrating recycled materials into their products. For instance, their curtain fabrics increasingly feature recycled plastic bottles and old jeans, showcasing how sustainable materials can be both functional and aesthetically pleasing (Karwei on more sustainable entrepreneurship: Karwei Website, n.d.). Additionally, they offer free collection of in their online shops, that lets the customer choose a date for pick up. This option is marked by a green leaf as the sustainable one. Information about the effectivity of this information display however was not assessed.

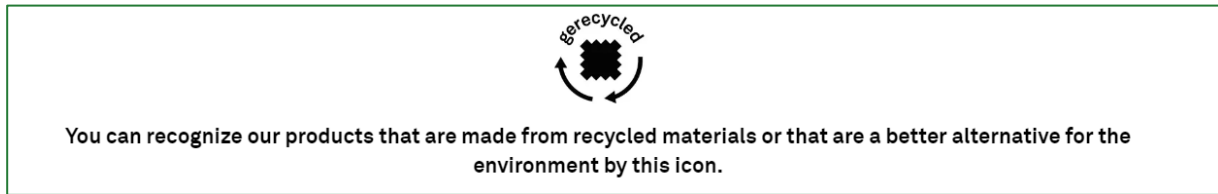


Figure 29 Karwei's icon for products made from recycled materials (<https://www.karwei.nl/>)

Lessons learned/implications for SuCoLo

This is another example showcasing the use of an icon used to deliver information about the different delivery choices with the aim to help the customer easier distinguish the sustainable option. This is similar to the example of dm.de. SuCoLo will adapt this for our own use case. The default ticking of the sustainable option cannot be transferred to SuCoLo, due to legislative changes. Since Karwei is a hardware store, most of the wares are larger in size and volume as those considered in SuCoLo. It's however worthwhile to gather information how different package sizes influence delivery options.

1.16 Best Practice case 16: Douglas.nl

Key facts

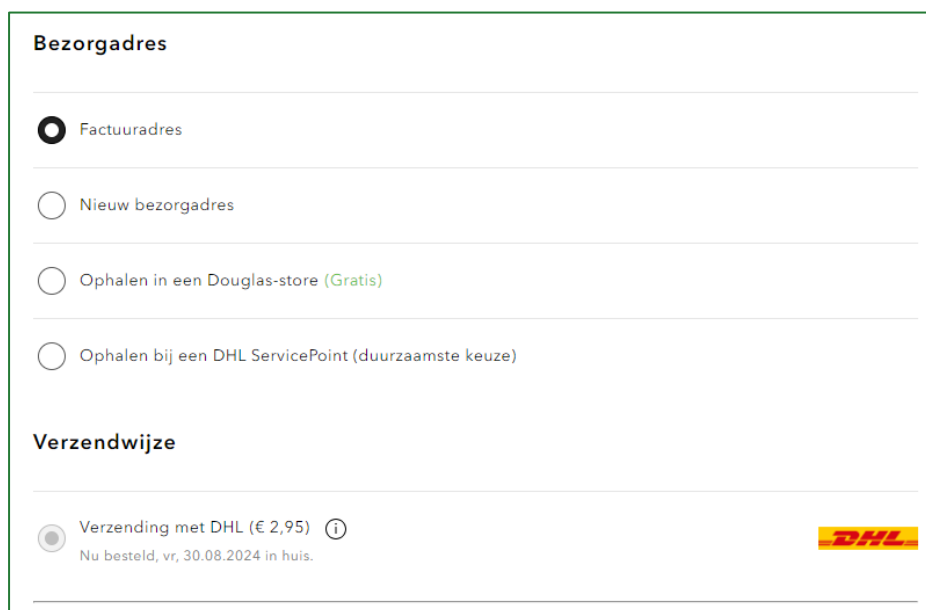
- **Initiator:** Douglas.nl
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences (Sustainable choice next to service point option), Material incentive (shipping free for in store delivery)
- **Promoted delivery mode:** Home delivery, Pick-up station, Store delivery
- **Product type:** Cosmetics
- **Used technology:** Website
- **Status:** Completed
- **Location/country:** Netherlands
- **Link:** <https://www.douglas.nl/nl>

Short description

Douglas is an international provider of beauty and cosmetic products. The company offers more than 1,850 local stores all over Europe, as well as an online shop. The Netherlands version of the online shop offers several delivery options, namely delivery via DHL, collection from Douglas store, and collection from DHL service point. (About Douglas: Douglas Website, n.d.)

BCT type

A BCT we commonly see and is apparent in the case of Douglas as well is the information about a sustainable delivery option, which is in this case a DHL Service Point. However, choosing another more sustainable option such as pickup in store is free of charge, acting as a material incentive. Additionally, if choosing the default delivery, consumers will still be able to act sustainably as DHL has sustainable delivery with electric vans, running on fuel produced from waste, residual oils and fats, working towards to making the last kilometres of the delivery fossil-free.



Bezorgadres

Factuuradres

Nieuw bezorgadres

Ophalen in een Douglas-store (Gratis)

Ophalen bij een DHL ServicePoint (duurzaamste keuze)

Verzendwijze

Verzending met DHL (€ 2,95) ⓘ

Nu besteld, vr, 30.08.2024 in huis.




Figure 30 Delivery options at checkout on Douglas's website (<https://www.douglas.nl/nl>)



Figure 31 Message about the sustainable delivery of DHL (<https://www.douglas.nl/nl>)

Results & evaluation

Douglas is dedicated to sustainability across its operations. The company emphasizes offering products with sustainable packaging and ethically sourced ingredients, alongside efforts to enhance energy efficiency in its stores and distribution centers. Douglas is also focused on promoting eco-friendly practices within its supply chain and actively engages in corporate social responsibility initiatives that support environmental conservation and community sustainability. However, there haven't been any tests as to whether free of charge pick up and the message about sustainable delivery via DHL changes consumer behaviour.

Lessons learned/implications for SuCoLo

The informational message concerning the vehicle type and fuel type is a worthwhile approach, along with having the informational BCT "most sustainable choice" without colors or icons. This is furthered by the fact that the message "gratis" is in green (although it does not concern sustainability information).

1.17 Best Practice case 17: Timberland

Key facts

- **Initiator:** Timberland
- **Application:** Practical application
- **BCT type:** Information about social and environmental consequences (Sustainable icon), Material incentive (shipping free for in store delivery)
- **Promoted delivery mode:** Home delivery, Pick-up station, Pick-up at the store
- **Product type:** Apparel
- **Used technology:** Website
- **Status:** Completed
- **Location/country:** Germany/Austria (Universal)
- **Link:** <https://www.timberland.at/de-at>

Short description

Timberland's mission is centred on fostering a collaborative community dedicated to advancing positive change. With a strong spirit of courage and dedication, Timberland addresses global challenges through innovative solutions. Since its inception, the company has focused on using its products to tackle various issues, evolving its commitment to address broader concerns such as climate justice and responsible production. This ongoing dedication reflects Timberland's aim to create meaningful impact both through its products and its community initiatives. (Our Story: Timberland Website, n.d.)

Timberland is an international clothing company from Switzerland known for their 6-inch boots. They offer a classic online shop with options for delivery and pick-up of the package at a postal station. Additionally, the shop offers the option to search for a local shop to buy the products there instead of from the website.

BCT type

The types of BCTs in the case of Timberland was firstly, the clear sign of a sustainable delivery option using a green leaf but also having it in clear writing next to the icon. The leaf and information text again being information about social and environmental consequences. Moreover, choosing the option of getting one's package from a pickup point is free, on the other hand the alternative options are not, encouraging the consumer with a material incentive to act more environmentally friendly.

1. Versand & Lieferung	
<p>Hauslieferung </p> <p>Standard Lieferung € 5,95</p>	<p>Abholstelle </p> <p> Lieferung mit geringsten Auswirkungen ⓘ</p> <p>Laden Kostenlos</p> <p>Abholung € 5,95</p>

Figure 32 Delivery options on Timberland's website <https://www.timberland.at/de-at>

Results & evaluation

A website article from 2020 stated that Timberland, has introduced a program where they plant a tree for every order selected for a 4–8-day delivery option instead of the standard 3-day shipping. This initiative is part of Timberland’s broader goal to plant 50 million trees by 2025. Amid growing pressure on shippers to reduce emissions linked to climate change, this effort aims to mitigate environmental impact. Timberland charges extra for the faster shipping option, which is chosen by fewer than 5% of customers (Our Story: Timberland Website, n.d.). Although the cost savings from the tree-planting program have not been detailed, experts suggest that switching to slower delivery could lower shipping costs by about 20% while enhancing the company’s environmental reputation. (Baertlein, 2020)

Lessons learned/implications for SuCoLo

Again, this this is another example of a green leaf and information field on sustainable delivery. This method was commonly used among the examples we found and mentioned in this catalogue. For Timberland however, the standard home delivery and the pick-up at postal station cost the same amount, but half as much as faster delivery. This is interesting as it offers no financial incentive for choosing the sustainable option. SuCoLo will mirror this in the field test of the behaviour change techniques to make sure the effects we observe are due to the implemented BCTs.

2. Conclusion

This document presents a comprehensive study on promoting sustainable consumer behaviour in online shopping delivery options, focusing on Behaviour Change Techniques (BCTs) to encourage environmentally friendly delivery choices. This desk research demonstrates that by implementing these BCTs and strategies, organizations have already sought to effectively promote environmentally friendly business practices while maintaining customer engagement. This compilation of best practices offers valuable insights for companies looking to adopt and tailor sustainable approaches across various industries, and to inform future research works in the SuCoLo project, as a novel inventory of BCTs to motivate and incentivise sustainable consumer delivery choices will be developed and tested. As a complement to prior desk research conducted within the SuCoLo project which conducted a meta-analysis of pertinent literature in this area, this document provides a practical glimpse as to how BCTs for sustainable consumer delivery choices have been implemented in a real-life setting.

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Annex I: BCT taxonomy: 93 hierarchically-clustered techniques

Goals and planning

Table 2 Annex I Goals and planning (Source: Michie et al., 2013)

Label	Definition
(1) Goal setting (behaviour)	Definition of a goal in terms of the behaviour to be achieved (goal setting is recommended if there is evidence that goals set as part of the intervention; if the goal is unspecified or is a behavioural outcome use <i>goal setting outcome</i> , or if the goal defines a specific context, frequency or duration of the behaviour, action planning should be used).
(2) Problem solving	Analysis, or prompt the person to analyse, factors influencing the behaviour and generate or select strategies that include overcoming barriers and/or increasing facilitators.
(3) Goal setting (outcome)	Set or agree on a goal defined in terms of a positive outcome of the behaviour that is strived for.
(4) Action planning	Prompt detailed planning of the performance of the behaviour (must include (at least one) either context, frequency, duration of intensity). The context can be environmental (physical or social) or internal (physical, emotional or cognitive => includes <i>implementation intentions</i>); Evidence of action planning does not automatically imply goal setting, only code latter is sufficient evidence
(5) Review behaviour goal(s)	Review behaviour goal(s) jointly with the person and consider modifying goal(s) or behaviour change strategy in terms of the achievement. This may lead to re-setting the same goal, a small change in that goal or setting a new goal instead of (or in addition to) the first, or no change; If the goal is specified in terms of behaviour, code <i>Review behaviour goal(s)</i> , if the goal is unspecified, code <i>Review outcome goal(s)</i> and if discrepancy is created consider <i>Discrepancy</i> between current behaviour and goal.
(6) Discrepancy between current behaviour and goal	Draw attention to discrepancies between a person's current behaviour (in terms of the form, frequency, duration, or intensity) and the person's previously set outcome goals, behavioural goals or action plans (goes beyond self-monitoring of behaviour); If discomfort is created only code <i>Incompatible beliefs</i> and not Discrepancy between current behaviour and goal; if goals are modified, also code <i>Review behaviour goal(s)</i> and/or, <i>Review outcome goal(s)</i> ; if feedback is provided, also code, <i>Feedback on behaviour</i> .

(7) Review outcome goal(s)	Review outcome goal(s) jointly with the person and consider modifying goal(s) in light of achievement. This may lead to resetting the same goal, a small change in that goal or setting a new goal instead of, or in addition to the first; If the goal is specified in terms of behaviour, code <i>Review behaviour goal(s)</i> , if goal unspecified, code <i>Review outcome goal(s)</i> ; if discrepancy is. created consider also <i>Discrepancy</i>
(8) Behavioural contract	Create a written specification of the behaviour to be performed, agreed on by the person, and witnessed by another person; also, code <i>Goal setting (behaviour)</i>
(9) Commitment	Ask a person to affirm or reaffirm statements indicating commitment to change the behaviour; If it is also defined in terms of behaviour to be achieved also code <i>Goal setting (behaviour)</i>

Feedback and monitoring

Table 3 Annex I Feedback and monitoring (Source: Michie et al., 2013)

Label	Definition
(1) Monitoring of behaviour by others without feedback	Observe or record behaviour with the person's knowledge as part of a behaviour change strategy; Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code; if feedback given, code only, <i>Feedback on behaviour</i> , and not, <i>monitoring of behaviour by others without feedback</i> ; if monitoring outcome(s) code, <i>Monitoring outcome(s) of behaviour by others without feedback</i> ; if self-monitoring behaviour, code, <i>Self-monitoring of behaviour</i>
(2) Feedback on behaviour	Monitor and provide informative or evaluative feedback on performance of the behaviour (e.g. form, frequency, duration, intensity) Note: if Biofeedback, code only, <i>Biofeedback</i> and not, <i>Feedback on behaviour</i> ; if feedback is on outcome(s) of behaviour, code, <i>Feedback on outcome(s) of behaviour</i> ; if there is no clear evidence that feedback was given, code, <i>Monitoring of behaviour by others without feedback</i> ; if feedback on behaviour is evaluative e.g. praise, also code, <i>Social reward</i>
(3) Self-monitoring of behaviour	Establish a method for the person to monitor and record their behaviour(s) as part of a behaviour change strategy Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code; if monitoring of outcome of behaviour, code <i>Self-monitoring of outcome(s) of behaviour</i> ; if monitoring is by someone else (without feedback), code <i>Monitoring of behaviour by others without feedback</i>
(4) Self-monitoring of	Establish a method for the person to monitor and record the outcome(s) of their behaviour as part of a behaviour change strategy Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code; if monitoring behaviour, code, <i>Self-</i>

outcome(s) of behaviour	<i>monitoring of behaviour</i> ; if monitoring is by someone else (without feedback), code, <i>Monitoring outcome(s) of behaviour by others without feedback</i>
(5) Monitoring outcome(s) of behaviour by others without feedback	Observe or record outcomes of behaviour with the person's knowledge as part of a behaviour change strategy; Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code; if feedback given, code only, <i>Feedback on outcome(s) of behaviour</i> ; if monitoring behaviour code, <i>Monitoring of behaviour by others without feedback</i> ; if self-monitoring outcome(s), code, <i>Self-monitoring of outcome(s) of behaviour</i>
(6) Biofeedback	Provide feedback about the body (e.g. physiological or biochemical state) using an external monitoring device as part of a behaviour change strategy; Note: if Biofeedback, code only, <i>Biofeedback</i> and not, <i>Feedback on behaviour</i> or, <i>Feedback on outcome(s) of behaviour</i>
(7) Feedback on outcome(s) of behaviour	Monitor and provide feedback on the outcome of performance of the behaviour; Note: if Biofeedback, code only, <i>Biofeedback</i> and not <i>Feedback on outcome(s) of behaviour</i> ; if feedback is on behaviour code <i>Feedback on behaviour</i> ; if there is no clear evidence that feedback was given code <i>monitoring outcome(s) of behaviour by others without feedback</i> ; if feedback on behaviour is evaluative e.g. praise, also code <i>Social reward</i>

Social support

Table 4 Annex I Social support (Source: Michie et al., 2013)

Label	Definition
(1) Social support (unspecified)	Advise on, arrange or provide social support (e.g. from friends, relatives, colleagues, 'buddies' or staff) or non-contingent praise or reward for performance of the behaviour. It includes encouragement and counselling, but only when it is directed at the behaviour; Note: attending a group class and/or mention of 'follow-up' does not necessarily apply this BCT, support must be explicitly mentioned; if practical, code <i>Social support (practical)</i> ; if emotional, code <i>Social support (emotional)</i> (includes 'Motivational interviewing' and 'Cognitive Behavioural Therapy')
(2) Social support practical	Advise on, arrange, or provide practical help (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performance of the behaviour; Note: if emotional, code <i>Social support (emotional)</i> ; if general or unspecified, code, <i>Social support (unspecified)</i> If only restructuring the physical environment or adding objects to the environment, code <i>Restructuring the physical environment</i> or <i>Adding objects to the environment</i> , attending a

	group or class and/or mention of 'follow-up' does not necessarily apply this BCT, support must be explicitly mentioned.
(3) Social support (emotional)	Advise on, arrange, or provide emotional social support (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performance of the behaviour; Note: if practical, code, <i>Social support (practical)</i> ; if unspecified, code <i>Social support (unspecified)</i>

Shaping knowledge

Table 5 Annex I Shaping knowledge (Source: Michie et al., 2013)

Label	Definition
(1) Instruction on how to perform a behaviour	Advise or agree on how to perform the behaviour (includes 'Skills training'); Note: when the person attends classes such as exercise or cookery, code <i>Instruction on how to perform the behaviour</i> , <i>Behavioural practice/rehearsal</i> and <i>Demonstration of the behaviour</i>
(2) Information about antecedents	Provide information about antecedents (e.g. social and environmental situations and events, emotions, cognitions) that reliably predict performance of the behaviour
(3) Re-attribution	Elicit perceived causes of behaviour and suggest alternative explanations (e.g. external or internal and stable or unstable)
(4) Behavioural experiments	Advise on how to identify and test hypotheses about the behaviour, its causes and consequences, by collecting and interpreting data

Natural consequences

Table 6 Annex I Natural consequences (Source: Michie et al., 2013)

Label	Definition
(1) Information about health consequences	Provide information (e.g. written, verbal, visual) about health consequences of performing the behaviour; Note: consequences can be for any target, not just the recipient(s) of the intervention; emphasising importance of consequences is not sufficient; if information about emotional consequences, code <i>Information about emotional consequences</i> ; if about social, environmental or unspecific consequences code <i>Information about social and environmental consequences</i>
(2) Salience of consequences	Use methods specifically designed to emphasise the consequences of performing the behaviour with the aim of making them more memorable (goes beyond information about consequences); Note: if information

	about consequences, also code <i>Information about health consequences</i> , <i>Information about emotional consequences</i> or <i>Information about social and environmental consequences</i>
(3) Information about social and environmental consequences	Provide information (e.g. written, verbal, visual) about social and environmental consequences of performing the behaviour; Note: consequences can be for any target, not just the recipient(s) of the intervention; if information about health consequences, code <i>Information about health consequences</i> ; if about emotional consequences code <i>Information about emotional consequences</i> ; if unspecific, code <i>Information about social and environmental consequences</i>
(4) Monitoring of emotional consequences	Prompt assessment of feelings after attempts at performing the behaviour
(5) Anticipated regret	Induce or raise awareness of expectations of future regret about performance of the unwanted behaviour; Note: not including <i>Information about emotional consequences</i> ; if suggests adoption of a perspective or new perspective in order to change cognitions also code <i>Framing/reframing</i>
(6) Information about emotional consequences	Provide information (e.g. written, verbal, visual) about emotional consequences of performing the behaviour; Note: consequences can be related to emotional health disorders (e.g. depression, anxiety) and/or states of mind (e.g. low mood, stress); not including <i>Anticipated regret</i> ; consequences can be for any target, not just the recipient(s) of the intervention; if information about health consequences code <i>Information about health consequences</i> ; if about social, environmental or unspecified code <i>Information about social and environmental consequences</i>

Comparison of behaviour

Table 7 Annex I Comparison of behaviour (Source: Michie et al., 2013)

Label	Definition
(1) Demonstration of the behaviour	Provide an observable sample of the performance of the behaviour, directly in person or indirectly e.g. via film, pictures, for the person to aspire to or imitate (includes 'Modelling'); Note: if advised to practice, also code <i>Behavioural practice and rehearsal</i> ; If provided with instructions on how to perform, also code <i>Instruction on how to perform the behaviour</i>
(2) Social comparison	Draw attention to others' performance to allow comparison with the person's own performance; Note: being in a group setting does not necessarily mean that social comparison is actually taking place

(3) Information about others' approval	Provide information about what other people think about the behaviour. The information clarifies whether others will like, approve or disapprove of what the person is doing or will do
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Association

Table 8 Annex I Association (Source: Michie et al., 2013)

Label	Definition
(1) Prompts/ cues	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance; Note: when a stimulus is linked to a specific action in an if-then plan including one or more of frequency, duration or intensity also code <i>Action planning</i>
(2) Cue signalling reward	Identify an environmental stimulus that reliably predicts that reward will follow the behaviour (includes 'Discriminative cue')
(3) Reduce prompts/ cues	Withdraw gradually prompts to perform the behaviour (includes 'Fading')
(4) Remove access to the reward	Advise or arrange for the person to be separated from situations in which unwanted behaviour can be rewarded in order to reduce the behaviour (includes 'Time out')
(5) Remove aversive stimulus	Advise or arrange for the removal of an aversive stimulus to facilitate behaviour change (includes 'Escape learning')
(6) Satiation	Advise or arrange repeated exposure to a stimulus that reduces or extinguishes a drive for the unwanted behaviour
(7) Exposure	Provide systematic confrontation with a feared stimulus to reduce the response to a later encounter
(8) Associative learning	Present a neutral stimulus jointly with a stimulus that already elicits the behaviour repeatedly until the neutral stimulus elicits that behaviour (includes 'Classical/Pavlovian Conditioning'); Note: when a BCT involves reward or punishment, code one or more of: <i>Material reward (behaviour)</i> ; <i>Nonspecific reward</i> ; <i>Social reward</i> ; <i>Self-reward</i> ; <i>Reward (outcome)</i>

Repetition and substitution

Table 9 Annex I Repetition and substitution (Source: Michie et al., 2013)

Label	Definition
(1) Behavioural practice/rehearsal	Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill Note: if aiming to associate performance with the context, also code <i>Habit formation</i>
(2) Behaviour substitution	Prompt substitution of the unwanted behaviour with a wanted or neutral behaviour; Note: if this occurs regularly, also code <i>Habit reversal</i>
(3) Habit formation	Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour; Note: also code <i>Behavioural practice/rehearsal</i>
(4) Habit reversal	Prompt rehearsal and repetition of an alternative behaviour to replace an unwanted habitual behaviour; Note: also code <i>Behaviour substitution</i>
(5) Overcorrection	Ask to repeat the wanted behaviour in an exaggerated way following an unwanted behaviour
(6) Generalisation of target behaviour	Advise to perform the wanted behaviour, which is already performed in a particular situation, in another situation
(7) Graded tasks	Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behaviour is performed

Comparison of outcomes

Table 10 Annex I Comparison of outcomes (Source: Michie et al., 2013)

Label	Definition
(1) Credible source	Present verbal or visual communication from a credible source in favour of or against the behaviour; Note: code this BCT if source generally agreed on as credible e.g., health professionals, celebrities or words used to indicate expertise or leader in field and if the communication has the aim of persuading; if information about health consequences, also code <i>Information about health consequences</i> , if about emotional consequences, also code <i>Information about emotional consequences</i> ; if about social, environmental or unspecified consequences also code <i>Information about social and environmental consequences</i>
(2) Pros and cons	Advise the person to identify and compare reasons for wanting (pros) and not wanting to (cons) change the behaviour (includes 'Decisional balance'); Note: if providing information about health consequences, also

	code <i>Information about health consequences</i> ; if providing information about emotional consequences, also code <i>Information about emotional consequences</i> ; if providing information about social, environmental or unspecified consequences also code <i>Information about social and environmental consequences</i>
(3) Comparative imagining of future outcomes	Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour

Reward and threat

Table 11 Annex I Reward and threat (Source: Michie et al., 2013)

Label	Definition
(1) Material incentive (behaviour)	Inform that money, vouchers or other valued objects will be delivered if and only if there has been effort and/or progress in performing the behaviour (includes 'Positive reinforcement'); Note: if incentive is social, code <i>Social incentive</i> if unspecified code <i>Non-specific incentive</i> , and not <i>Material incentive (behaviour)</i> ; if incentive is for outcome, code <i>Incentive (outcome)</i> . If reward is delivered also code one of: <i>Material reward (behaviour)</i> ; <i>Non-specific reward</i> ; <i>Social reward</i> , <i>Self-reward</i> ; <i>Reward (outcome)</i>
(2) Material reward (behaviour)	Arrange for the delivery of money, vouchers or other valued objects if and only if there has been effort and/or progress in performing the behaviour (includes 'Positive reinforcement'); Note: If reward is social, code <i>Social reward</i> , if unspecified code <i>Nonspecific reward</i> , and not <i>Material reward (behaviour)</i> ; if reward is for outcome, code <i>Reward (outcome)</i> . If informed of reward in advance of rewarded behaviour, also code one of: <i>Material incentive (behaviour)</i> ; <i>Social incentive</i> ; <i>Non-specific incentive</i> ; <i>Self-incentive</i> ; <i>Incentive (outcome)</i>
(3) Non-specific reward	Arrange delivery of a reward if and only if there has been effort and/or progress in performing the behaviour (includes 'Positive reinforcement'); Note: if reward is material, code <i>Material reward (behaviour)</i> , if social, code <i>Social reward</i> , and not <i>Nonspecific reward</i> ; if reward is for outcome code <i>Reward (outcome)</i> . If informed of reward in advance of rewarded behaviour, also code one of: <i>Material incentive (behaviour)</i> ; <i>Social incentive</i> ; <i>Non-specific incentive</i> ; <i>Self-incentive</i> ; <i>Incentive (outcome)</i>
(4) Social reward	Arrange verbal or non-verbal reward if and only if there has been effort and/or progress in performing the behaviour (includes 'Positive reinforcement'); Note: if reward is material, code <i>Material reward (behaviour)</i> , if unspecified code <i>Non-specific reward</i> , and not <i>Social</i>

	<i>reward</i> ; if reward is for outcome code <i>Reward (outcome)</i> . If informed of reward in advance of rewarded behaviour, also code one of: <i>Material incentive (behaviour)</i> ; <i>Social incentive</i> ; <i>Non-specific incentive</i> ; <i>Self-incentive</i> ; <i>Incentive (outcome)</i>
(5) Social incentive	Inform that a verbal or non-verbal reward will be delivered if and only if there has been effort and/or progress in performing the behaviour (includes 'Positive reinforcement'); Note: if incentive is material, code <i>Material incentive (behaviour)</i> , if unspecified code <i>Non-specific incentive</i> , and not <i>Social incentive</i> ; if incentive is for outcome code <i>Incentive (outcome)</i> . If reward is delivered also code one of: <i>Material reward (behaviour)</i> ; <i>Non-specific reward</i> ; <i>Social reward</i> , <i>Self-reward</i> ; <i>Reward (outcome)</i>
(6) Non-specific incentive	Inform that a reward will be delivered if and only if there has been effort and/or progress in performing the behaviour (includes 'Positive reinforcement'); Note: if incentive is material, code <i>Material incentive (behaviour)</i> , if social, code <i>Social incentive</i> and not <i>Non-specific incentive</i> ; if incentive is for outcome code <i>Incentive (outcome)</i> . If reward is delivered also code one of: <i>Material reward (behaviour)</i> ; <i>Non-specific reward</i> ; <i>Social reward</i> , <i>Self-reward</i> ; <i>Reward (outcome)</i>
(7) Self-incentive	Plan to reward self in future if and only if there has been effort and/or progress in performing the behaviour; Note: if self-reward is material, also code <i>Material incentive (behaviour)</i> , if social, also code <i>Social incentive</i> , if unspecified, also code <i>Non-specific incentive</i> ; if incentive is for outcome code <i>Incentive (outcome)</i> . If reward is delivered also code one of: <i>Material reward (behaviour)</i> ; <i>Non-specific reward</i> ; <i>Social reward</i> , <i>Self-reward</i> ; <i>Reward (outcome)</i>
(8) Incentive (outcome)	Inform that a reward will be delivered if and only if there has been effort and/or progress in achieving the behavioural outcome (includes 'Positive reinforcement'); Note: this includes social, material, self- and non-specific incentives for outcome; if incentive is for the behaviour code <i>Social incentive</i> , <i>Material incentive (behaviour)</i> , <i>Non-specific incentive</i> or <i>Self-incentive</i> and not <i>Incentive (outcome)</i> . If reward is delivered also code one of: <i>Material reward (behaviour)</i> ; <i>Non-specific reward</i> ; <i>Social reward</i> , <i>Self-reward</i> ; <i>Reward (outcome)</i>
(9) Self-reward	Prompt self-praise or self-reward if and only if there has been effort and/or progress in performing the behaviour; Note: if self-reward is material, also code <i>Material reward (behaviour)</i> , if social, also code <i>Social reward</i> , if unspecified, also code <i>Non-specific reward</i> ; if reward is for outcome code <i>Reward (outcome)</i> . If informed of reward in advance of rewarded behaviour, also code one of: <i>Material incentive (behaviour)</i> ; <i>Social incentive</i> ; <i>Non-specific incentive</i> ; <i>Self-incentive</i> ; <i>Incentive (outcome)</i>

(10) Reward (outcome)	Arrange for the delivery of a reward if and only if there has been effort and/or progress in achieving the behavioural outcome (includes 'Positive reinforcement'); Note: this includes social, material, self- and non-specific rewards for outcome; if reward is for the behaviour code <i>Social reward</i> , <i>Material reward (behaviour)</i> , <i>Non-specific reward</i> or <i>Self-reward</i> and not <i>Reward (outcome)</i> . If informed of reward in advance of rewarded behaviour, also code one of: Material incentive (behaviour); Social incentive; Non-specific incentive; Self-incentive; Incentive (outcome)
(11) Future punishment	Inform that future punishment or removal of reward will be a consequence of performance of an unwanted behaviour (may include fear arousal) (includes 'Threat')

Regulation

Table 12 Annex I Regulation (Source: Michie et al., 2013)

Label	Definition
(1) Pharmacological support	Provide, or encourage the use of or adherence to, drugs to facilitate behaviour change; Note: if pharmacological support to reduce negative emotions (i.e. anxiety) then also code <i>Reduce negative emotions</i>
(2) Reduce negative emotions	Advise on ways of reducing negative emotions to facilitate performance of the behaviour (includes 'Stress Management') Note: if includes analysing the behavioural problem, also code <i>Problem solving</i>
(3) Conserving mental resources	Advise on ways of minimising demands on mental resources to facilitate behaviour change
(4) Paradoxical instructions	Advise to engage in some form of the unwanted behaviour with the aim of reducing motivation to engage in that behaviour

Antecedents

Table 13 Annex I Antecedents (Source: Michie et al., 2013)

Label	Definition
(1) Restructuring the physical environment	Change, or advise to change the physical environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments); Note: this may also involve <i>Avoidance/reducing exposure to cues for the behaviour</i> , if restructuring of the social environment code <i>Restructuring the social environment</i> , if only adding objects to the environment, code <i>Adding objects to the environment</i>

(2) Restructuring the social environment	Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments); Note: this may also involve <i>Avoidance/reducing exposure to cues for the behaviour</i> ; if also restructuring of the physical environment also code <i>Restructuring the physical environment</i>
(3) Avoidance/reducing exposure to cues for the behaviour	Advise on how to avoid exposure to specific social and contextual/physical cues for the behaviour, including changing daily or weekly routines; Note: this may also involve <i>Restructuring the physical environment</i> and/or <i>Restructuring the social environment</i> ; if the BCT includes analysing the behavioural problem, only code <i>Problem solving</i>
(4) Distraction	Advise or arrange to use an alternative focus for attention to avoid triggers for unwanted behaviour
(5) Adding objects to the environment	Add objects to the environment in order to facilitate performance of the behaviour; Note: Provision of information (e.g. written, verbal, visual) in a booklet or leaflet is insufficient. If this is accompanied by social support, also code <i>Social support (practical)</i> ; if the environment is changed beyond the addition of objects, also code <i>Restructuring the physical environment</i>
(6) Body changes	Alter body structure, functioning or support directly to facilitate behaviour change

Identity

Table 14 Annex I Identity (Source: Michie et al., 2013)

Label	Definition
(1) Identification of self as role model	Inform that one's own behaviour may be an example to others
(2) Framing/reframing	Suggest the deliberate adoption of a perspective or new perspective on behaviour (e.g. its purpose) in order to change cognitions or emotions about performing the behaviour (includes 'Cognitive structuring'); If information about consequences then code <i>Information about health consequences</i> , <i>Information about emotional consequences</i> or <i>Information about social and environmental consequences</i> instead of <i>Framing/reframing</i>

(3) Incompatible beliefs	Draw attention to discrepancies between current or past behaviour and self-image, in order to create discomfort (includes 'Cognitive dissonance')
(4) Valued self-identify	Advise the person to write or complete rating scales about a cherished value or personal strength as a means of affirming the person's identity as part of a behaviour change strategy (includes 'Self-affirmation')
(5) Identity associated with change behaviour	Advise the person to construct a new self-identity as someone who 'used to engage with the unwanted behaviour'

Scheduled consequences

Table 15 Annex I Scheduled consequences (Source: Michie et al., 2013)

Label	Definition
(1) Behaviour cost	Arrange for withdrawal of something valued if and only if an unwanted behaviour is performed (includes 'Response cost'); Note if withdrawal of contingent reward code, <i>Remove reward</i>
(2) Punishment	Arrange for aversive consequence contingent on the performance of the unwanted behaviour
(3) Remove reward	Arrange for discontinuation of contingent reward following performance of the unwanted behaviour (includes 'Extinction')
(4) Reward approximation	Arrange for reward following any approximation to the target behaviour, gradually rewarding only performance closer to the wanted behaviour (includes 'Shaping')
(5) Rewarding completion	Build up behaviour by arranging reward following final component of the behaviour; gradually add the components of the behaviour that occur earlier in the behavioural sequence (includes 'Backward chaining'); Note: also code one of <i>Material reward (behaviour); Non-specific reward; Social reward, Self-reward; Reward (outcome)</i>
(6) Situation-specific reward	Arrange for reward following the behaviour in one situation but not in another (includes 'Discrimination training'); Note: also code one of <i>Material reward (behaviour); Non-specific reward; Social reward, Self-reward; Reward (outcome)</i>
(7) Reward incompatible behaviour	Arrange reward for responding in a manner that is incompatible with a previous response to that situation (includes 'Counter-conditioning'); Note: also code one of <i>Material reward (behaviour); Non-specific reward; Social reward, Self-reward; Reward (outcome)</i>

(8) Reward alternative behaviour	Arrange reward for performance of an alternative to the unwanted behaviour (includes 'Differential reinforcement'); Note: also code one of <i>Material reward (behaviour)</i> ; <i>Non-specific reward</i> ; <i>Social reward</i> , <i>Self-reward</i> ; <i>Reward (outcome)</i> ; consider also coding <i>Problem solving</i>
(9) Reduce reward frequency	Arrange for rewards to be made contingent on increasing duration or frequency of the behaviour (includes 'Thinning'); Note: also code one of <i>Material reward (behaviour)</i> ; <i>Non-specific reward</i> ; <i>Social reward</i> , <i>Self-reward</i> ; <i>Reward (outcome)</i>
(10) Remove punishment	Arrange for removal of an unpleasant consequence contingent on performance of the wanted behaviour (includes 'Negative reinforcement')

Self-belief

Table 16 Annex I Self-belief (Source: Michie et al., 2013)

Label	Definition
(1) Verbal persuasion about capability	Tell the person that they can successfully perform the wanted behaviour, arguing against self-doubts and asserting that they can and will succeed
(2) Mental rehearsal of successful performance	Advise to practise imagining performing the behaviour successfully in relevant contexts
(3) Focus on past success	Advise to think about or list previous successes in performing the behaviour (or parts of it)
(4) Self-talk	Prompt positive self-talk (aloud or silently) before and during the behaviour

Covert learning

Table 17 Annex I Covert learning (Source: Michie et al., 2013)

Label	Definition
(1) Imaginary punishment	Advise to imagine performing the unwanted behaviour in a real-life situation followed by imagining an unpleasant consequence (includes 'Covert sensitisation')
(2) Imaginary reward	Advise to imagine performing the wanted behaviour in a real-life situation followed by imagining a pleasant consequence (includes 'Covert conditioning')

(3) Vicarious consequences	Prompt observation of the consequences (including rewards and punishments) for others when they perform the behaviour; Note: if observation of health consequences, also code <i>Information about health consequences</i> ; if of emotional consequences, also code <i>Information about emotional consequences</i> , if of social, environmental or unspecified consequences, also code <i>Information about social and environmental consequences</i>
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