



DEFINITION OF CONSUMER GROUPS

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List of abbreviations and acronyms

Acronym	Meaning
B2C	Business-to-consumer
CBC	Choice-based conjoint
ICT	Information and communication technology
LC-MNL	Latent class multinomial logit model
NAM	Norm activation model
SPSS	Statistical package for social sciences
TPB	Theory of Planned behaviour
TTM	Transtheoretical model of behaviour change
WP	Work package

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Abstract

The rapid growth of e-commerce has intensified pressures on urban transport systems, particularly through last-mile deliveries. Despite the availability of sustainable alternatives, consumer use remains limited. It is therefore important to map how consumers make choices for sustainable delivery and returns based on a range of characteristics, including socio-economic and demographic profiles, online shopping behaviour, attitudes towards sustainability and the influence of social networks, and identifying a range of consumer profiles suited to different behavioural change strategies.

This deliverable identifies four consumer personas based on motivation, sustainability awareness, and behavioural habits related to (sustainable) delivery and return options. These profiles, Pro-sustainable, Uncommitted, Ignorant, and Careless, are drawn from an integrated analysis of academic literature, attitudinal data, delivery preference patterns, and qualitative insights into real-life decision-making.

This segmentation supports the development of behavioural interventions, communication strategies, and policy tools that align with the practical realities of consumer behaviour. Emphasising psychological and situational drivers over static demographic traits, this approach contributes to more targeted and effective efforts to encourage sustainable e-commerce practices.

The analysis confirms that attitudes toward sustainability and contextual enablers offer greater predictive power than socio-demographic characteristics. While some consumers align behaviour with environmental values, many are constrained by convenience, habitual routines, or insufficient information. Even among those expressing strong sustainability concerns, situational constraints often override intentions.

Tailored strategies are necessary to engage each consumer type. Pro-sustainable consumers benefit from clear and trustworthy information, while uncommitted and ignorant consumers require nudges, simplified options, and improved transparency. For careless consumers, structural interventions such as default settings and price incentives are likely to be more effective than awareness campaigns alone.

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Executive summary

The rise of e-commerce has transformed how goods are consumed and delivered, offering on one side unprecedented convenience for consumers. On the other hand, it also introduced significant societal and environmental challenges. With parcel volumes growing rapidly across Europe, last-mile deliveries now contribute significantly to (urban) pollution, congestion, greenhouse gas emissions, and associated public health risks such as traffic accidents and noise exposure. CodeZERO seeks to address these challenges by co-creating sustainable, zero-emission delivery and return solutions for e-commerce that are aligned with the preferences of consumers while remaining viable for retailers, logistics providers, and local authorities.

Achieving sustainability in last-mile delivery requires more than just offering greener options, it also depends on the consumer. Behavioural change remains difficult to achieve because delivery decisions are made in fast-paced, goal-oriented, and often habitual contexts. There is a focus on increasing knowledge and awareness of sustainability, but this alone does not always lead to sustainable delivery choices. Aligning consumer awareness and sustainable delivery choices requires a better understanding of how people make decisions in real shopping situations, especially when sustainability competes with other priorities such as cost, speed and convenience.

This deliverable contributes to that understanding by identifying **consumer profiles suited to different behavioural change strategies**. Using a combination of literature review, a large-scale quantitative analysis and in-depth qualitative research, four distinct consumer personas were developed: Pro-sustainable, Uncommitted, Ignorant, and Careless. These personas are defined not by demographics, but by psychological dimensions, motivation to act sustainably, perceived opportunity, and habitual behaviour patterns.

Desk research

Improving the sustainability of last-mile delivery requires not only the supply of greener options but also a shift in consumer behaviour. Existing literature shows that **consumer preferences** for delivery attributes, such as speed, cost, flexibility, and sustainability, **are far from uniform**. Some consumers prioritise price above all else, while others are more sensitive to convenience, service reliability, or environmental impact. These variations point to the need for differentiated behavioural change strategies rather than one-size-fits-all solutions. To better understand this diversity in preferences, insights from **behavioural psychology** have proven essential. While early studies often focused on socio-demographic factors, their explanatory power has been limited and inconsistent. In contrast, psychological approaches identify **three core behavioural drivers** that shape behaviour:

- **Motivation:** The intention or desire to act sustainably, which varies based on personal values, beliefs, and social norms.
- **Opportunity:** The informational capacity to act, including access to and the clarity of sustainability information.
- **Habit:** The degree to which past experiences, default settings, and routine behaviours influence decision-making.

Together, these drivers offer a more accurate and actionable framework for understanding consumer behaviour in sustainable e-commerce. They help explain why increased awareness alone often fails to produce behavioural change, and why some consumers are more responsive to sustainability cues than others. **Four profiles were identified:**

- **High motivation/ High opportunity:** Individuals who are both motivated to act sustainably and feel capable of doing so.
- **High motivation/ Low opportunity:** Individuals who want to act sustainably but feel constrained by lack of information.
- **Low motivation/ High opportunity:** Individuals who have the information to act sustainably but place low priority on environmental concerns.
- **Low motivation/ Low opportunity:** Individuals who are neither inclined nor informed to make sustainable delivery choices.

Empirical validation and insights

To validate the consumer profiles identified through the desk research, the large-scale survey conducted in Deliverable 2.5 was used to **replicate the attitudinal segmentation approach** applied in earlier studies. Using the same items, a two-step cluster analysis resulted in a solution closely aligned with the initial typology.

These segments were then further developed by **linking** them to the **segments derived from the choice-based conjoint analysis**, which assessed how consumers made trade-offs between cost, convenience, and sustainability in delivery choices. The results showed that each attitudinal profile exhibited different **delivery preferences**. A multinomial logistic regression confirmed that **attitudinal profiles** were the **strongest predictors** of delivery preferences, outperforming **socio-demographic variables**. This reinforces the importance of psychological and behavioural segmentation in explaining consumer decision-making.

The validated profiles provide a basis for designing targeted behavioural strategies and are further enriched through qualitative insights into real-world contexts.

Real-life decision-making and the role of context

Qualitative insights from Deliverables 2.2 and 2.3 show that delivery decisions are made within broader routines and everyday constraints, not through deliberate comparison. Consumers typically rely on **familiar cues** rather than actively considering sustainability. Many decisions are shaped by delivery-collection strategies, where the chosen **option fits into daily life**. Even consumers with high motivation toward sustainability often default to convenience when green options are unclear, unavailable, or require extra effort.

Moreover, **sustainability information was rarely mentioned** and if mentioned, there were some trust issues. Additionally, the interface design, especially unclear layouts, hidden costs, or limited control frequently pushed consumers toward less sustainable choices. Past delivery experiences further influenced expectations and reinforced habits.

These findings highlight the **importance of situational context, habits, and interface design** in shaping behaviour. They also point to the need for interventions that reflect how decisions are made, in fast, intuitive, and often constrained settings.

Profiles and strategies

Building on the desk research, Deliverable 2.2, 2.3 and 2.5, four consumer profiles were defined and validated. Each represents a distinct combination of behavioural drivers and corresponds to different delivery preferences, stages of change, and intervention needs:

- **Pro-sustainable consumers** (high motivation, high opportunity) seek sustainable delivery options. Their behaviour is typically value-driven and already aligned with sustainability goals. They are in the action or maintenance stage and respond well to transparent information, visible eco-labels, and reinforcement through feedback or social engagement.
- **Ignorant consumers** (high motivation, low opportunity) are willing to act sustainably but lack the necessary information, clarity, or trust to do so. They tend to prefer service-oriented or home delivery options but remain open to change. Interventions should focus on simplifying decision environments, improving the visibility and credibility of sustainability cues, and addressing knowledge gaps.
- **Uncommitted consumers** (low motivation, high opportunity) have access to greener choices but prioritise cost and convenience. Often in the contemplation stage, they respond best to extrinsic motivators such as price incentives, default options, and social norm messaging.
- **Careless consumers** (low motivation, low opportunity) are primarily driven by habit and cost, showing limited interest in or awareness of sustainability. They tend to default to low-cost, home delivery options and are typically in the precontemplation stage. For this group, structural changes, such as pre-selected sustainable defaults, pricing reforms, or accessibility nudges are more effective than informational campaigns.

These profiles provide a framework for designing behavioural strategies that are tailored to the needs, barriers, and readiness levels of different consumer groups. They highlight the importance of going beyond awareness-raising and addressing the specific psychological and contextual factors that shape real-world delivery decisions. This framework contributes to the broader goals of CodeZERO by informing future communication strategies, local authority tools, and retailer interventions aimed at accelerating the shift to sustainable last-mile delivery systems in e-commerce

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1 Introduction

1.1 About CodeZERO

CodeZERO is a three-year Horizon Europe research project aiming to co-create **sustainable and zero-emission last-mile delivery and return solutions for ecommerce** that align with **consumers'** preferences while being sustainable for **retailers, logistics operators** and **local authorities**. Additionally, the project is focused on providing clear, consumer-friendly communication and developing tools for local authorities to promote eco-friendly behaviour.

CodeZERO is articulated in four phases:

- An **ANALYSIS** phase which provides (1) an analysis of existing delivery and return options and an understanding of how they are shaped by the needs and constraints of all involved stakeholders; (2) an in-depth intersectional analysis of various groups of on-line consumers to understand what are the features of delivery and return options making them attractive, with the aim to identify mechanisms to incentivize behaviour changes; and (3) an assessment framework to measure the impacts in the environmental, economic and social domains of new solutions.
- A **DESIGN** phase, in which CodeZERO engages in a co-design process involving retailers, transport operators, consumers and local authorities in developing (1) guidelines for retailers to raise awareness among consumers; (2) a set of zero-emission and sustainable delivery and return options for retailers and transport operators; and (3) a toolset for local authorities to accelerate the transition towards sustainable solutions in last mile consignments in e-commerce.
- A **TEST** phase running four pilots in four different European cities in Italy, Netherlands, Belgium, and Norway to test a set of sustainable solutions identified in the previous phase with the aim to prove their feasibility, to fine-tune their design and to assess their impacts from the perspective of all stakeholders.
- A **CONSOLIDATION** phase where (1) CodeZERO outcomes are fine-tuned based on the lessons learned from real life applications, (2) requirements for up-scaling of solutions at European level are discussed (3) recommendations are formulated and (4) directions for future research are outlined.

Engagement with consumers and retailers' associations, industry stakeholders, cities and researchers contribute to shaping project results.

Running from June 2024 to May 2027, CodeZERO is organized along eight WPs:

- WP1 Analysis of current delivery models
- WP2 Analysis of consumers' behaviour
- WP3 CodeZERO assessment framework
- WP4 Design of CodeZERO solutions
- WP5 Testing solutions: CodeZERO living labs
- WP6 Conclusions and recommendations
- WP7 Dissemination, communication and exploitation
- WP8 Project management.

1.2 Background and rationale

Despite efforts to reduce its environmental impact, Europe continues to consume more resources and contribute more to environmental deterioration, creating all sorts of sustainability challenges such as resources scarcity, biodiversity losses or increase of the greenhouse gas emissions (EEA, 2024). When it comes to the greenhouse gas emissions, the transport sector is a major contributor, accounting for 26% of the EU's total greenhouse gas emissions and remaining the only sector that hasn't been able to cut the emissions since 1990 (Masterson, 2022). Within this sector, e-commerce and the growth in home delivery has emerged as a growing factor driving emissions higher (EEA, 2024).

Over the last decade, e-commerce has been growing at a two-digit rate, estimated to reach 30% of retail sales by 2030 (Lone et al., 2023). Added to this are the knock-on effects of the COVID-19

pandemic which, aside from any short-term impacts, had a powerful accelerating effect on e-commerce, fast-forwarding the industry four to six years ahead of pre-pandemic forecasts (Koetsier, 2020). An increasing number of consumers use the business-to-consumer (B2C) e-commerce channel to order products online and have them delivered at home, with an average of 76% of European e-shoppers favouring home delivery (Geopost, 2024). However, this preference varies across regions, ranging from 82% in Spain to lower rates in Northern and Eastern Europe (58% in Poland), where options like parcel lockers are more popular (68% in Estonia) (Geopost, 2024). This, in turn, has led to sizeable growth in home delivery packages, increasing use of light goods vehicles for parcel deliveries and hence magnifying the externalities associated with greenhouse gas emissions, traffic congestion, pollution, and noise in urban areas where pressure is already high due to the increase in urban density (Cardenas et al., 2017; Allen et al., 2018).

Moreover, the heterogeneity of products sold online adds further complexities in logistics due to products with different needs in terms of fragility, volumes (e.g., furniture), temperature control (e.g. food), delivery times and level of service expected by the consumers. Given the European Green Deal's goal of reducing transport emissions by 90% by 2050 (European Commission, 2020), and the continued expansion of e-commerce, it is crucial to fully understand the sector's impact on sustainability.

Furthermore, when adequately employed, e-commerce has the potential to enhance the sustainability impact and outcomes. Recognizing this, governments, logistics service providers, and retailers are increasingly implementing solutions aimed at improving the sustainability of e-commerce. Innovations such as parcel lockers can improve delivery consolidation, leading to more efficient delivery round and reduced mileage for each delivery (Deutsch and Golany, 2018; Seghezzi et al., 2022). However, the success of these initiatives depends on active consumer participation, which is often overlooked. Moreover, studies assessing the environmental impact generally rely on simplified assumptions about consumer behaviour (Buldeo Rai et al., 2023). Niemeijer and Buijs (2023) and Mommens et al. (2021) have shown that the distance to the parcel locker and degree of urbanisation significantly affect the most sustainable delivery options for consumers. It has been demonstrated that if all consumers opt for the most environmentally friendly delivery choices, societal and ecological costs could decrease by 21% (Mommens & Cauwelier, 2025), highlighting the significance of consumers in the process of making e-commerce more sustainable.

Understanding the factors that influence consumer willingness to adopt these solutions is thus of utmost importance. And given the diversity in what people value and prioritize, it's crucial to distinguish different profiles within the population to design effective interventions that encourage sustainable practices (Verplanken, 2018; Caspersen & Navrud, 2021). Klöckner's (2013) meta-analysis identified three main antecedents of environmental behaviour: motivation (intention), habit and opportunity (facilitators and barriers). Together, these elements partly account for the difficulty of changing unsustainable behaviours. First, because not everyone has an environmental mindset or gives equal priority to sustainability-related values, and hence impacting their motivation (Baxter & Pelletier, 2020; Balderjahn et al., 2019). Second, structural barriers such as lack of awareness, or the unavailability of these opportunities may limit the opportunity for sustainable choices (Sheoran & Kumar, 2022). Finally, habits and ignorance of habitual decision-making processes may make it difficult for individuals exhibiting unsustainable behaviour to adopt a more sustainable lifestyle (Verplanken & Orbell, 2022; Linder et al., 2022).

Additionally, when it comes to online shopping, previous research showed that demographic and behavioural variables (e.g., age, education, income, and frequency of online purchases) influence consumers' decisions in online retailing. Eurostat annual surveys (2024) on ICT usage in households and by individuals indicate that since 2010 individuals aged 25-34 have consistently shown the highest share of online buyers year after year, reaching 87% participation rate in 2023. However, the gap between age categories is gradually closing. Data also suggest that the level of education is positively correlated to e-commerce. While in 2022, 56% of people with a low level of formal education bought online, this rate increased to 74% for medium level and 88% for individuals with higher education (Eurostat, 2024). However, Hernandez et al. (2011) found that once individuals attain the status of experienced e-shopper their general online shopping behaviour is similar, independently of their socio-economic characteristics. Similar findings in other domains, such as waste management and energy conservation both of which are associated with pro-environmental behaviour, indicate that

socioeconomic factors have little statistically influence on individuals' likelihood to adopt these behaviours (Abrahamse & Steg, 2009; Botetzagias et al., 2015). However, researchers Chekima et al. (2016) found that education level and gender had a significant positive moderation effect on green purchase intentions. As pointed out by Caspersen & Navrud (2021), research on demographic characteristics is contradictory.

These findings suggest that also consumer preferences for delivery attributes of an online purchase may therefore be different with respect to demographic, socioeconomic and behavioural variables. This aspect is, however, currently understudied. A better understanding of various consumer groups preferences for delivery attributes is thus of great importance to build options attractive to each group and design incentives schemes effectively steering their behaviour towards greener choices.

1.3 Aim and structure of this document

This deliverable focuses on identifying a range of consumers profiles suited to different behavioural change strategies. The main goal is to map how consumers make sustainable delivery and return choices based on a range of characteristics, including socio-economic and demographic profiles, online shopping behaviours, attitudes toward sustainability, and the influence of social networks.

To achieve this, a review of existing literature was conducted to examine how these variables correlate with the adoption of sustainable delivery and return options. The goal was to consider specific factors such as age, gender, income, education level, occupation, and household composition, as well as geographic context (e.g. urban vs. rural residence, country of origin, car usage, and access to retail infrastructure). The analysis also integrates behavioural variables, such as frequency and type of online purchases, price sensitivity, and product categories, alongside attitudinal dimensions, including environmental engagement and broader lifestyle patterns.

Based on this review, a set of consumer personas was selected, building directly on the typology proposed by Cauwelier et al. (2024), which identifies four distinct consumer profiles, i.e., the pro-sustainable consumer, the uncommitted consumer, the ignorant consumer and the careless consumer. These profiles are primarily defined by differences in beliefs and attitudes toward sustainability. Socioeconomic and demographic played only a limited role in this segmentation. The literature and our own findings suggest that demographic characteristics such as age, gender, and income are often inconsistent predictors of sustainable behaviour. In contrast, attitudinal, behavioural, and contextual factors emerged as far more meaningful indicators for distinguishing between consumer groups. Results from Deliverables 2.2 (Pernot et al., 2025), 2.3 (Phillips & Pernot, 2025) and 2.5 (Cauwelier et al., 2025) were included in this report to refine the personas. These different consumer groups will inform the communication guidelines (Deliverable 4.3).

The document is structured as follows. The report opens with the methodological approach used to form the consumer profiles in Section 2. Section 3 further explains the first phase of this process. This phase includes a literature review looking at consumer preferences in terms of delivery and return choices on the one hand, and the drivers behind sustainable behaviour and behavioural change on the other. Chapter 4 then provides a validation and further development of the profiles by linking them to the results from Deliverable 2.5. Chapter 5 presents a summary of the consumer personas. Chapter 6 places these profiles within the context of the findings from Deliverables 2.2 (Pernot et al., 2025) and 2.3 (Phillips & Pernot, 2025). Finally, Chapter 7 presents the conclusion, which includes a discussion of the implications of the findings for actors who want to encourage consumers to choose sustainable supply options.

2 Methodology

This deliverable's objective is to determine different consumer segments suited for various behavioural change techniques in the context of sustainable e-commerce returns and delivery. To achieve this, the methodology was structured in stages: it started with a desk research and was subsequently enriched and expanded through qualitative and quantitative findings from Deliverables 2.2, 2.3, and 2.5.

2.1 Desk research phase

The desk research phase focused on summarising existing literature about consumer preferences and behavioural patterns related to sustainable last-mile delivery in e-commerce. The desk research was conducted in August 2024 using Web of Science and Google Scholar databases. Keywords included: *sustainable e-commerce*, *last-mile delivery*, *consumer behaviour*, *psychological drivers*, and *attitudinal segmentation*. These keywords were chosen to identify articles that empirically or theoretically segment consumers based on behavioural, psychological, and or contextual factors relevant to sustainable last mile delivery.

In addition to mapping the existing segmentations, due to the desk research phase process it also became clear that to fully understand the complexity of sustainable consumer behaviour, it was necessary to bridge two complementary but unevenly developed fields: the literature on behavioural psychology, which offers a deeper understanding of motivational and cognitive drivers, and the literature on transportation and logistics, which offers operational insights into delivery choices of consumers. However, the latter often treats consumer behaviour as a black box (Sallnäs & Björklund, 2020). It tends to focus on demographic characteristics, which frequently lead to inconclusive results (Caspersen & Navrud, 2021), rather than examining the underlying decision-making processes. Accordingly, the research focused on consumer decision making in delivery and return options, particularly examining the roles of motivation, habit, opportunity, demographic characteristics, and environmental attitudes.

Building on this desk research, the initial development of the consumer profiles was based on two studies. Cauwelier et al. (2024), in the field of transportation and logistics, propose four consumer profiles based on attitudes towards sustainability in e-commerce: the careless, the uncommitted, the ignorant, and the pro-sustainable consumer. These cluster reflect behavioural constructs such as motivation (e.g., concern for sustainability) and opportunity (e.g., access to sustainable delivery options or information). In parallel, the segmentation framework developed by Verplanken (2018) offers a conceptual model based on these same behavioural drivers, i.e., motivation and opportunity as well as habit. This work situates consumer behaviour within a broader psychological context and identifies intervention strategies tailored to different behavioural profiles. Together, these studies enabled to create consumer profiles that are both theoretically solid and empirically supported.

2.2 Quantitative validation: cluster analysis

Deliverable 2.5 (Cauwelier et al. 2025), in which a large-scale dataset (N=10092) was collected, allowed for both statistical validation of the consumer profiles chosen from the desk study and additional enrichment by including more details about their delivery preferences.

To do the validation of the consumer profiles, the same attitudinal items and segmentation approach as applied in Cauwelier et al. (2024) was integrated in the survey, allowing for direct replication.

Therefore, a two-step cluster analysis was conducted on the attitudinal items of the survey in SPSS.

At first, a four-cluster solution was obtained from the analysis, which reflected the results reported by Cauwelier et al. (2024). Before confirming the two-step cluster analysis's findings, four validation tests had to be assessed (Tkaczynski, 2017). First, the silhouette measure of cohesion and separation was 0.4, indicating a fair level of internal consistency and separation between clusters. A value above 0.2 suggests acceptable clustering, while any value greater than 0 confirms that between- and within-cluster distances are valid. Second, all clusters differed significantly on the included segmentation variables ($p = 0.000$), confirming that the attitudinal groups represent distinct consumer profiles. Third, all variables used in the cluster analysis showed a predictor importance of 1.00, well above the minimum threshold of 0.02, and indicating strong contributions to the cluster solution. Finally, to assess the reliability of the segmentation, the dataset was randomly split in half and the clustering analysis repeated. The

replication yielded the same number of clusters, identical predictor importance values, and comparable segment characteristics ($p < 0.001$), thereby confirming the robustness of the clustering solution. This resulted in a four-cluster solution that closely mirrors Cauwelier et al.'s (2024) findings: Careless consumers (Survey D2.5 results: 14.8%; Cauwelier et al.'s (2024) results: 23.4%), Ignorant consumers (Survey D2.5 results: 22.6%; Cauwelier et al.'s (2024) results: 22.4%), Uncommitted consumers (Survey D2.5 results: 33.5%; Cauwelier et al.'s (2024) results: 32.0%), and Pro-sustainable consumers (Survey D2.5 results: 29.1%; Cauwelier et al.'s (2024) results: 22.2%). These clusters reflect varying levels of awareness, importance, and willingness to act on sustainability in e-commerce (Cauwelier et al., 2024).

Secondly, to enrich these profiles with additional information about their delivery preferences, the results of the choice-based conjoint analysis were used. More specifically, the behavioural segments found when addressing research question 1b in Deliverable (2.5), where distinct differences in trade-offs between delivery parameters were found using a Latent Class Multinomial Logit (LC-MNL) model: (1) price-sensitive consumers (38.0%), who prioritise low-cost options; (2) location-driven consumers (14.7%), who favour home delivery; (3) service-oriented consumers (22.7%), who seek flexibility and additional features; and (4) sustainability-driven consumers (24.8%), who prefer sustainable friendly delivery partner.

To examine how attitudinal profiles align with these behavioural patterns, two analyses have been performed. First, a cross-tabulation analysis offered a descriptive overview of segment overlap. Second, a multinomial logistic regression assessed the predictive power of the attitudinal clusters while controlling for socio-demographic variables. The dependent variable was the delivery preference segment derived from the choice-based conjoint analysis in Deliverable 2.5, while attitudinal cluster membership and socio-demographic variables, such as age, gender, education level, living environment, occupation, country of residence, and the presence of children in the household, purchase volume and most common used delivery option served as the predictors. All assumptions for multinomial logistic regression were met. This will be discussed in chapter 4.

2.3 Qualitative contextualisation: biographical Insights

Deliverable 2.2 (Pernot et al. 2025) helped with getting qualitative insight into how consumers form, maintain, or change their delivery and return behaviours. The biographical method was used to examine behavioural change over time. This approach acknowledges that beside attitudes, changing living circumstances may influence consumer decisions and behaviour. The interviews focus on how significant life events might serve as a catalyst for re-evaluation, creating either possibilities or obstacles for behavioural change.

The study involved conducting 21 semi-structured biographical interviews with individuals in four countries (Italy, Norway, Belgium, and the Netherlands) in September and October of 2024. The interviews lasted between one and two hours. The main focus was to get information on how the online shopping and delivery practices of the participant had evolved over time. As a result, the interview addressed knowledge and perceptions of sustainable delivery, motivational factors, changes in routines, and trust in sustainability information. These interviews showed how awareness, social norms, habits, and situational constraints influenced delivery decisions and frequently acted as a mediator between sustainability values and actual behaviour.

Those findings shed light on the diversity of consumer experiences and the importance of integrating the behavioural profiles in real-life contexts. For example, even among those who expressed strong sustainability concerns, differences in awareness, trust and daily routines resulted into another decision-making process and thus behaviour. This will be further developed in the Discussion section (Chapter 6).

2.4 Qualitative contextualisation: real-time decision making

The findings of deliverable 2.3 (Phillips & Pernot, 2025) offered an additional perspective on consumer behaviour by focusing on the real-time decision-making processes. To do so, the methodological approach builds on cognitive task analysis by using retrospective interviews together with think-aloud protocols. First, participants were asked about previous online shopping experiences with question

about their choices, reasonings, and constraints. Second, participants participated in think-aloud simulations in which they had to justify their choices and thoughts while using live e-commerce platforms. A total of 22 interviews were conducted in four countries (Italy, Norway, Belgium, and the Netherlands) in September and October of 2024. This made it possible to get insight on both retrospective reasoning and in-the-moment thought process of consumers. To avoid any bias in the responses from participants and to observe impromptu versus provoked sustainability behaviour, sustainability elements were only included after the first simulation.

This method demonstrated how consumer choices were impacted by practical, cognitive, and interface-related aspects. Even when participants voiced worries about sustainability, they frequently selected well-known or practical solutions, such as the quickest or least expensive delivery option. Others expressed interest in more environmentally friendly options, but they either didn't trust the information or had trouble properly comparing options. In addition to the narratives in D2.2, the think-aloud interviews in D2.3 provided an additional perspective. While D2.2 focused on how behaviour evolves over time, D2.3 captured how choices unfold in the moment. Together, they offered a broader understanding of how consumers make trade-offs between sustainability, convenience and cost, further refining the interpretation of the profiles. These insights feed back into the discussion chapter to assess how context, habit and situational constraints influence the potential for behavioural change.

3 Desk research

3.1 Consumer preferences in delivery and return choices

Understanding consumer preferences regarding delivery and return options is crucial in promoting sustainable behaviours in e-commerce. As online retailers are now offering a variety of delivery alternatives, each with different combinations of features and continuing to expand their offerings (Nguyen et al., 2019), this can significantly impact sustainability. The literature consistently identifies cost and convenience as primary drivers of delivery and return choices (Gawor & Hoberg, 2018; Buldeo Rai et al., 2019; Agatz et al., 2021; Thomas et al., 2022). Sustainability-related trade-offs are becoming more relevant, though they remain less frequently observed in practice (Caspersen and Navrud, 2021; Polinori et al., 2018, Cauwelier et al., 2024). Moreover, the importance of these factors is not uniform across all consumers (Caspersen and Navrud, 2021, Nguyen et al., 2019).

Across many studies, cost followed by convenience emerge as dominant influences. Consumers generally prefer delivery options that are low-cost and fast, even if this comes at the expense of other features. Nguyen et al. (2019) identified delivery cost, speed, tracking, and carrier reliability as key attributes in shaping online repeat purchases. In their choice-based conjoint (CBC) analysis, delivery price was by far the most important factor. Buldeo Rai et al. (2019) similarly found that price consistently outweighed other considerations, including return options and delivery reception. Additional work by Molin et al. (2022) and de Oliveira et al. (2017) supports this, showing that raising the cost of home delivery or expanding access to parcel lockers significantly changes consumer behaviour, often away from default choices like home delivery.

However, preferences for cost and convenience are far from homogeneous. Several studies provide evidence of clear segmentation in the way consumers evaluate delivery features. Nguyen et al. (2019) clustered the choice based conjoint responses into three recurring profiles across convenience, shopping, and specialty goods, i.e., (1) Price-oriented consumers, (2) time- and convenience-oriented consumers, and (3) value-for-money consumers. These segments varied in how they weighed delivery price against flexibility and speed, with demographic patterns showing that female and lower-income consumers were more likely to be price-sensitive, while male and higher-income consumers leaned toward convenience. Gawor and Hoberg (2018) proposed a complementary typology of (1) Budgeters, (2) Lead-time shoppers, (3) Convenience shoppers, and (4) Balanced buyers, further reinforcing the idea that consumer preferences reflect different trade-offs. Buldeo Rai et al. (2021) extended this segmentation to crowd-shipping, identifying (1) Trailblazers (innovative and eco-conscious), (2) E-Opportunists (convenience-first), (3) Traditional consumers (value-driven), and (4) Aloof consumers

(uninvolved). These profiles illustrate that consumer decisions are not just shaped by practical needs, but also by broader attitudinal dispositions.

Recent studies have also shown that sustainability concerns are becoming more relevant, though often conditional. When environmental benefits are made explicit and trustworthy, some consumers are willing to adjust their preferences. Ignat and Chankov (2020), Buldeo Rai et al. (2021), and Kokkinou et al. (2024) found that consumers may accept slower delivery when sustainability is made tangible. Yet, Allen et al. (2018) cautioned that fast delivery remains the default in practice, even among consumers who express environmental concern, particularly when alternatives are not prominently framed or incentivised. Moreover, Polinori et al. (2018) and Schniederjans and Starkey (2014) demonstrated that green attitudes and social influence can increase willingness to pay for eco-friendly options.

Segmentation approaches have also been used to explore these sustainability trade-offs in more detail. Caspersen and Navrud (2021) identified based on a discrete experiment, consumer profiles that prioritise speed, environmental impact, or neither, reinforcing the idea that pro-environmental behaviour is not automatic and varies considerably across the population. Cauwelier et al. (2024) identified attitudinal clusters based on statements about sustainability in e-commerce, ranging from (1) Careless, (2) Ignorant and (3) Uncommitted to (4) Pro-sustainable consumers. These clusters differ not only in their awareness and motivation, but also in their opportunity to act, pointing to psychological, structural, and contextual barriers that moderate sustainable delivery choices.

Taken together, these studies suggest that while most consumers care about price and convenience, their willingness to compromise in favour of sustainability depends on who they are, what they value, and how they perceive the available options. These variations highlight the need for differentiated strategies in how sustainability information is communicated at the point of delivery choice. The following section explores the psychological foundations of these behaviours in more depth, focusing on how motivation, habit, and opportunity shape delivery decisions and explain why sustainable options are embraced by some consumers but overlooked by others.

3.2 Drivers of sustainable behaviour and change

While this deliverable ultimately focuses on delivery preferences in e-commerce context, understanding the drivers of sustainable behaviour and change more broadly offers valuable insights. As previously mentioned, three main antecedents of environmental behaviour were revealed in a meta-analysis based on 56 different data sets by Klöckner (2013): opportunity (facilitators and barriers), habit, and motivation. Based on those three elements, Verplanken (2018) identified four different consumer group (low motivation/low opportunity; high motivation/ high opportunity; low motivation/ high opportunity & high motivation/ low opportunity). These groups emphasise the need for context-specific behaviour change strategies and the necessity of campaigns that focus on de-habitualizing behaviour in addition to attitude-change campaigns (Verplanken, 2018). Overall, this indicates that motivation, habit and opportunities is what ultimately shapes behaviour, including pro-environmental actions. In the following sections, these three core drivers will be explored in depth and linked with sustainable behaviours. Despite being covered separately, it's important to note that these factors are frequently intertwined. By offering consumers clear, practical guidance and strong social support, this increases the likelihood that they will feel confident and capable of acting in challenging circumstances (Klöckner, 2013).

3.2.1 Motivation

Understanding motivation is essential if we want to grasp how individuals behave and engage in pro-environmental actions. The self-determination theory, which Deci & Ryan (1985) developed, distinguishes two types of motivation: intrinsic and extrinsic motivation. Intrinsic motivation is when people engage in activities because they intrinsically enjoy it or find it interesting. For example, a consumer might be willing to wait longer for their parcel because they value sustainability and want to support environmentally responsible practices. On the other hand, extrinsic motivation involves doing something to achieve a specific outcome or reward. For instance, a consumer might choose to opt for slower delivery to receive a discount offered for selecting more sustainable delivery option. While both examples will result in sustainable behaviour, the motivations behind the actions are far from the same. It is also therefore important to note that people sometimes engage in pro-environmental behaviour for

non-environmental reasons, with the main motivation being cost savings or health improvements (Gifford & Nilsson, 2014).

When encouraging an action at first, extrinsic motivation in the form of financial incentives may be especially successful (Amaya & Smith, 2018). Agatz et al. (2021) and Thomas et al. (2022) both observed that the implementation of price discounts increases the likelihood of the choice for eco-friendly timeslots and no-rush deliveries. These results demonstrate that in e-commerce, where price holds significant weight for consumers (Buldeo Rai et al., 2019), financial nudges can be impactful. However, Agatz et al. (2021) found that using intrinsic motivational variables such as 'green labelling' is even more effective than using extrinsic motivation (price) solely to encourage consumers to choose sustainable delivery slots. Studies indicate that environmentally friendly behaviour tends to persist with intrinsic motivators, while extrinsic ones often lead to temporary changes (Baxter & Pelletier, 2020). This highlights the importance of understanding individuals' core values and attitudes towards a specific behaviour (White et al., 2019) to align with the specific needs and motivations of the target consumers (Abrahamse et al., 2007; Balderjahn et al., 2018). In the context of e-commerce, it is thus crucial to consider what matters most to consumers. Research indicates that consumers prioritize price and service over environmental concerns, while global variations exist in the willingness to choose sustainable delivery options (Creazza et al., 2023).

Another important example of extrinsic motivation is social influence and social norms. They are one of the most well-known and frequently applied strategies to promote behavioural change (Osbaldeston & Schott, 2012; Trudel, 2019). These concepts explain the psychological process that causes humans to modify their behaviour, attitudes, and beliefs as a result of the presence or actions of others (Abrahamse & Steg, 2013). In the context of encouraging sustainable consumer behaviour, researchers Demarque et al. (2015) found that the use of descriptive norms, i.e., describing what other consumers are doing, positively impacts the purchase of eco-labelled products. However, data from a study on digital nudges for sustainable delivery slot choices by Auf der Landwehr et al. (2021) did not reveal a significant change in choice behaviour for the use of social norms. Research conducted by De Bauw et al. (2022) did also find that solely the use of social norms did not ensure a change towards pro-environmental food choices. This is possibly a result of the fact that respondents could not sufficiently identify with the described peers, so the social norm from the study was not perceived as an actual norm (De Bauw et al., 2022). According to a study by Buldeo Rai et al. (2021), using a social media sharing option combined with a social norm had a bigger impact on consumers' decisions to choose sustainable delivery slots than just using a social media sharing option alone.

All the above-mentioned factors can also be found in two influential models in behavioural psychology (Duong, 2023): the Theory of Planned behaviour (TPB) (Ajzen, 1991) and the Norm Activation Model (NAM) (Schwartz, 1977). The theory of planned behaviour (TPB) offers a framework for understanding both intrinsic and extrinsic motivation by shedding light on how attitudes, social norms, and perceived behavioural control influence behavioural intentions, which are represented as predictors of motivation and behaviour (Ajzen, 1991; Verplanken, 2018). However, TPB is primarily a model of intention, not actual behaviour. It struggles to account why people fail to follow through on their sustainable intentions, a gap that can be explained by habit (see 3.2.2) and situational barriers (see 3.2.3). On the other hand, the Norm Activation Model focuses on the role of personal norms and moral consideration in motivating behaviour (Schwartz, 1977), aligning closely with intrinsic motivation. People are driving to act in environmentally friendly ways when they recognize the consequences of their actions, feel a sense of responsibility, and experience personal moral norms. By considering the complex interplay between intrinsic and extrinsic motivation, we can design more effective strategies to encourage sustainable behaviour in e-commerce and beyond.

3.2.2 Habit

While motivation drives initial choices, it is often habits that determine whether sustainable behaviour becomes routine. The average adult makes about 33 000 to 35 000 decisions daily (Reill, 2023). These decisions can be as simple as choosing what to wear or have for breakfast, or they can be more complicated like choosing long-term objectives and aspirations. In his book *Thinking, fast and slow*, Daniel Kahneman (2011) describes how two brain systems, i.e., system 1 (intuition and instinct) and system 2 (rational thinking), compete for control of behaviour. System 1 often dominates and leads the

decision-making process. This is where habits come into play and are shortcuts in the decision process as part of the system 1 thinking. An individual's memory is shaped by habits, which associate past rewards or cues with specific actions in particular contexts (Mazar & Wood, 2018). And it is this automatic nature of these responses that makes changing unwanted habits particularly challenging. This demonstrates the importance of habits. However, habits tend to be overlooked in favour of informational and attitudinal change strategies in sustainability efforts (Verplanken & Orbell, 2022). In the e-commerce landscape, defined by convenience and flexibility, consumers have embraced and become accustomed to its ease (Benartzi & Lehrer, 2017). Additionally, the habitual use may also contribute to enhanced consumer enjoyment, thereby intensifying the challenge of encouraging behavioural change (Reber et al., 2004).

According to Mazar & Wood (2022), the attitude-behaviour gap, a term used in the literature to describe the disconnect between people's behaviour and their attitudes, can be partly explained by habits. While their study does not quantify the contribution of habit versus attitude, broader behavioural research shows that the relative strength of these drivers depends on the type of behaviour. Meta-analyses and theoretical reviews (Klöckner, 2013; Verplanken & Orbell, 2022) consistently find that attitudes are more predictive of one-time or reflective actions, such as switching to a sustainable brand, whereas habits tend to dominate in repeated, routine behaviours, such as transportation mode choice or selecting default delivery options. This is where we can observe a link with the first section on motivation (see 3.2.1), while motivation plays a key role in driving behaviour, habitual patterns often override the conscious decision-making. People's conscious decisions to accomplish goals are frequently the initial driving force behind the creation of habit (Wood & Rünger, 2016). Yet people might also form a lot of habits from actions they don't necessarily plan to take (Linder et al., 2022). For example, limited transparency about a product origin or environmental impact can reinforce the habit of buying from unsustainable brands, even when consumers prefer to support sustainable and ethical practices. Similarly, the lack of convenient access to parcel lockers near one's home can encourage the habit of opting for home delivery, even if a more sustainable option like using a parcel locker would have been preferred. From all of this, it would appear that changing these deeply ingrained habits is impossible, yet it is precisely their context-dependent automaticity that offers a way forward for changing them.

Three general principles have been identified by research and summarized by Mazar & Wood (2022) to help create interventions that change the unwanted and unsustainable habits. First there is, modifying the friction, by for example setting the wanted behaviour as a default option. This is based on the notion that individuals frequently do not make active choice; hence, the use of default option is used to prioritise and set the sustainable action (Schubert, 2017). By doing so, it can take away some of the psychological barriers (Gifford, 2011) and make the decision-making process and sustainable option easier (White et al., 2019). Research shows that when default options are implemented for out-of-home delivery, significantly more people tend to stick with that option (Mitchell et al., 2022). The second principle involved modifying action cues, which are the triggers that prompt a certain behaviour (Mazar et al., 2021). Labels and other digital prompts are examples of action cues in the context of e-commerce.

As was previously stated in the section on motivation (see 3.2.1), Agatz et al. (2021) discovered that the use of green labels encouraged consumers to select delivery timeslots that were sustainable. In their experiments, around 81% of consumers selected the green labelled time slots, compared to 62% for the price incentives and only 20% when no incentive was used. This means that the use of green labels was more effective in encouraging consumers, especially among more eco-conscious individuals, to select delivery timeslots that were sustainable than price discounts. Follow-up simulations showed that when consumers were nudged towards greener time slots using these labels, the overall delivery distances were reduced by up to 12.6%, particularly in lower-density areas. This not only helped reduce the environmental impact but also operational costs. Additionally, Buldeo Rai et al. (2021) found that using information labels about the sustainability impact had a positive impact on people's decisions to choose to wait longer to receive a package. This indicates that the application of green labels may help with the creation of sustainable habits in addition to having an effect on consumers' intrinsic motivation. Finally, the third principle focuses on the use of incentives and penalties to shift habitual behaviours (Mazar et al., 2021). This is a prominent method to break existing unwanted and unsustainable habits (Verplanken & Orbell, 2022; White et al., 2019).

3.2.3 Opportunity

In addition to motivation and habit, opportunity also plays a crucial role in shaping sustainable behaviour (Klößner, 2013). Opportunity can be defined not only to the practical ability to act sustainably through infrastructure, pricing, and service availability, but also to whether consumers are aware of these options, trust the information presented, and can recognise and access them within the decision environment. Blake (1999) argues that for individuals who do not have a strong environmental interest (motivation), these forces present an even stronger barrier. The issue with environmental challenges is that it generates structural barriers such as unavailability of a sustainable choice (Sheoran & Kumar, 2022), but also cognitive barriers which may limit the opportunity for sustainable choices. Examples of cognitive barriers are limited cognition which refers to the difficulty in grasping complex environmental issues or mistrust arises when individuals doubt the credibility of environmental information, leading to apathy about issues like pollution (Gifford, 2011). For example, when consumers are presented with complex information regarding the environmental impact of different delivery options, they may feel overwhelmed, leading to decision paralysis and a preference for the simplest choice available, often opting for faster, less sustainable options (White et al., 2019).

In the context of e-commerce, opportunities are closely linked to the choices offered by retailers and the selection of logistic service providers, which impact the availability of environmentally friendly options (structural), the cost of those options (financial constraint), and the availability of easily comprehensible information (knowledge) (Verplanken, 2018; Tsarenko et al., 2013). For instance, some web shops may present sustainable delivery options without clear labels or with vague terms such as “eco” or “green,” leaving consumers unsure about what these options mean. In other cases, sustainability information may be buried deep in the checkout process or phrased in overly technical language, making it difficult to understand or compare. As a result, even when consumers are motivated, they may overlook or distrust these options, defaulting to faster or cheaper choices simply because they are easier to interpret. This cognitive lens on opportunity is central to understanding what enables or prevents more sustainable behaviour.

3.2.4 Stages of changes

While the previous sections explored what drives sustainable behaviour, i.e. motivation, habit and opportunity, they do not fully explain when individuals are actually ready to act. The transtheoretical model of behaviour change (TTM) describes behavioural change as a continuous process where individuals move through various phases instead of changing their behaviour suddenly (Prochaska & Velicer, 1997). This framework, which consists of five stages, helps explaining the differences in readiness to change.

In the early (1) precontemplation stage, individuals are not yet considering change and may be unaware that their current behaviour contributes to the harm. In the (2) contemplation stage, they begin to recognise the issue and think about changing, although no commitment is made. Those in the (3) preparation stage have formed an intention to act and may already be taking small steps. The (4) action stage involves making concrete behavioural changes, while the final (5) maintenance stage reflects continued effort to sustain these new behaviours over time.

Importantly, this model acknowledges that people do not always progress linearly. It is common for individuals to remain in a particular stage for a long period or to relapse when they encounter structural or psychological barriers (Bamberg & Schulte, 2018). In this sense, the TTM provides a more dynamic understanding of behaviour change, particularly relevant for sustainable consumption where intentions, habits, and opportunities often interact in complex ways. By identifying where individuals are in their behavioural journey, this model helps tailor interventions more effectively, whether the goal is raising awareness, prompting small steps, or supporting long-term commitment to sustainable choices.

3.3 From preferences and drivers to personas

The previous sections outlined, on the one hand, consumer behaviour in the context of e-commerce delivery where consumer preferences tend to centre around trade-offs between cost, convenience and sustainability, with clear evidence of heterogeneity across different consumer segments. On the other hand, section 3.2 examined the broader psychological factors (i.e., motivation, habit, and opportunity)

that shape whether and how consumers act on these preferences, as well as their readiness to change over time.

When combined, these findings imply that examining preferences alone is insufficient to completely comprehend sustainable delivery behaviour. Rather, the underlying psychological factors and attitudinal trends that explain why some consumers are more able and ready to make sustainable choices while others are resistant or indifferent, even when the chance is there, must be considered.

To capture this, the selection of personas used in the deliverable draws from the attitudinal segmentation identified by Cauwelier et al. (2024) but embeds it within the behavioural change model proposed by Verplanken (2018). Cauwelier et al. (2024) propose four attitudinal segments, the Careless, Ignorant, Uncommitted, and Pro-sustainable Consumer grounded in the domain of transportation and logistics, and reflecting key constructs motivation (e.g., concern for sustainability) and opportunity (e.g., access to sustainable delivery options). Second, Verplanken's (2018) behavioural change model, which provides a broader psychological framework, helps with understanding how motivation, opportunity and habit, as third dimension, interact to shape sustainable behaviour. The framework identifies four types of consumers based on the interaction of these variables, offering insight into how behavioural change occurs.

By integrating these two segmentations, the personas are both empirically and theoretically grounded (Figure 1). The profiles align closely with the segments identified by Cauwelier et al. (2024) but are further refined through Verplanken's (2018) model, allowing to situate each profile within a behavioural change quadrant.

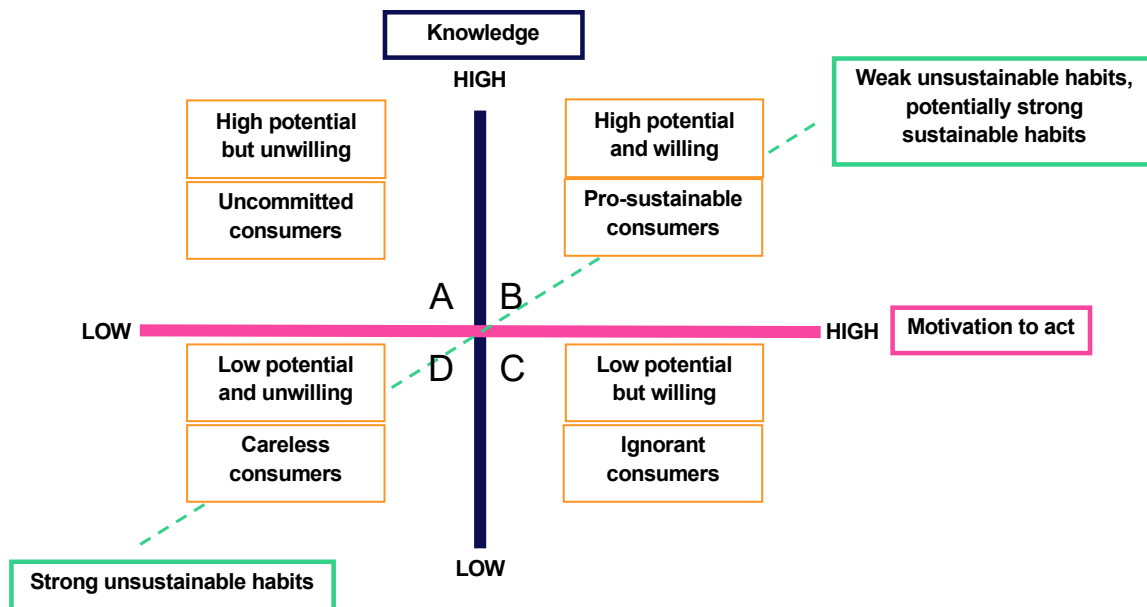
The Careless Consumer score low on awareness and motivation to act sustainably which translates in a low willingness to change (Cauwelier et al., 2024). When mapped on Verplanken's model, this profile aligns with those who exhibit both low motivation and limited opportunity (low awareness and knowledge) (D-quadrant). According to Verplanken (2018), the group can be characterized by strong unsustainable habits, making behavioural change particularly challenging. As a result, these consumers are unlikely to adopt sustainable behaviours without strong external intervention such as regulatory measures or structural reforms in the delivery system (Verplanken, 2018).

In contrast, the Ignorant consumer score high on motivation but low on awareness which makes impacts the opportunity to act. Cauwelier et al. (2024) describe this group as motivated but lack knowledge which impact their choices. These consumers fall into C-quadrant of Verplanken's (2018) model, where motivated individuals are held back by external barriers, such as insufficient knowledge about alternatives. Their unsustainable habits are moderate and often formed by default due to structural constraints. Interventions here should focus on removing the barriers, such as increasing the visibility of sustainable options to break established routines and enable new, sustainable behaviour.

The uncommitted consumers are aware of sustainability issues but indicate they give little importance to them, leading to a passive attitude and willingness to change (Cauwelier et al., 2024). This segment corresponds with A-quadrant in Verplanken's model. Even though, they have the necessary information and knowledge, these consumers lack the internal drive to act more sustainably. Their habits are moderately unsustainable, often maintained through convenience or inertia rather than opposition to sustainability (Verplanken, 2018). With this group, emotional arguments are less effective than indirect stimuli and motivators, such as financial rewards or social influence (Verplanken, 2018). With other words, interventions that make sustainable behaviour easier, cheaper or and more socially desirable could help nudge them toward change.

Finally, the pro-sustainable consumers exhibit that they are well educated about the topic, value sustainability personally and show a clear willingness to adopt environmentally friendly behaviour (Cauwelier et al., 2024). This group maps directly onto the B-quadrant of Verplanken's framework, characterized by both capacity and commitment to act sustainably. They also have the weakest unsustainable habits, and many of them may already be building sustainable routines (Verplanken, 2018). These consumers can be empowered as leaders or ambassadors in community-based sustainability projects. They are also the ideal candidates for goal setting and commitment-based treatments. Supporting and amplifying their efforts can lead to broader cultural shifts, as their behaviours and attitudes ripple through social networks.

Figure 1: Consumer segmentation for sustainable behaviour interventions: A model based on Verplanken (2018) and adapted with insights from Cauwelier et al. (2024)



These personas are further refined by using qualitative data from Deliverables 2.2 and 2.3 and quantitative data from Deliverable 2.5 that follows in Sections 4, 5 and 6.

4 Linking delivery preferences with consumer profiles

In this section, the delivery preferences segments found in Deliverable 2.5 (Cauwelier et al., 2025) are used to further enrich the consumer personas by linking it with the attitudinal cluster identified through desk research. Specifically, it examines the relationship between the attitudinal profiles and behavioural segments. As outlined in the methodology, the same approach as Cauwelier et al. (2024) was followed, forming the basis of the selected consumer profiles.

4.1 Descriptive differences between segments

To examine the relationship between the attitudinal clusters and the delivery segments, a cross-tabulation analysis was performed. The Pearson chi-square test confirmed a statistically significant association ($\chi^2 = 1554.988$, $df = 9$, $p < .001$), and a Cramer's V of 0.227 indicated a moderate relationship between the two classifications (Table 1).

The results show that attitudinal segments are not evenly distributed across delivery preference segments. Careless consumers were disproportionately represented in the price-sensitive segment, with a standardized residual of 16.5 and 24.9% of them falling into this group. They were also slightly more present in the location-driven segment (19.4%, residual = 4.5), while being markedly underrepresented in both the service-oriented (8.4%) and sustainability-driven (2.0%) segments, with large negative residuals of -7.9 and -16.8 respectively. This pattern reflects a strong preference towards low-cost options and a clear disinterest in sustainability.

Ignorant consumers, on the other hand, were most likely to belong to the service-oriented segment (28.9%, residual = 6.2), indicating a preference for convenience and consumer service features. Their distribution across the other delivery segments is more balanced, with no extreme deviations, though they were slightly underrepresented in the sustainability-driven group (16.6%, residual = -6.3).

Uncommitted consumers showed a broad spread across segments, with the highest shares in the price-sensitive (36.7%) and location-driven (35.8%) groups. While their standardized residuals are more

moderate, they still indicate a tendency toward convenience and affordability, and a clear underrepresentation in the sustainability-driven segment (27.5%, residual = -5.2). In contrast, pro-sustainable consumers were overwhelmingly present in the sustainability-driven segment (53.9%), with a standardized residual of 23.1. This is by far the strongest association observed in the analysis. This group was moderately present in the service-oriented segment (29.6%) and underrepresented in both the price-sensitive (16.0%, residual = -15.2) and location-driven (20.9%, residual = -5.8) groups, confirming a strong alignment between their attitudes and delivery choices. Overall, these results confirm that attitudinal clusters are reflected in consumers' delivery preferences. While not deterministic, the associations are strong enough to suggest that psychological orientation is a meaningful driver of behavioural segmentation in the context of e-commerce delivery choices.

Table 1: Cross-tabulation of attitudinal profiles and delivery preferences segments

		Price-sensitive consumers	Location-driven consumers	Service-oriented consumers	Sustainability-driven consumers
Careless consumers	%within attitudinal cluster	24.9% ^A	19.4% ^B	8.4% ^C	2.0% ^D
	Standardised residual	16.5	4.5	-7.9	-16.8
Ignorant consumers	%within attitudinal cluster	22.4% ^A	24.0% ^A	28.9% ^B	16.6% ^C
	Standardised residual	-0.3	1.1	6.2	-6.3
Uncommitted consumers	%within attitudinal cluster	36.7% ^A	35.8% ^{A, B}	33.2% ^B	27.5% ^C
	Standardised residual	3.4	1.5	-0.3	-5.2
Pro-sustainable consumers	%within attitudinal cluster	16.0% ^A	20.9% ^B	29.6% ^C	53.9% ^D
	Standardised residual	-15.2	-5.8	0.4	23.1

Each subscript letter denotes a subset of two-step cluster number categories whose column proportion do not differ significantly from each other at the 0.05 level

4.2 Predicting Delivery Preferences from Attitudinal Profiles

Additionally, a multinomial logistic regression was conducted to examine the extent to which consumers' delivery preferences, together with their socio-demographic characteristics, can explain differences in attitudinal segment membership.

The overall model showed a significant improvement in fit compared to the intercept-only model ($\chi^2 = 3037.990$, $df = 108$, $p < .001$), indicating that the predictors collectively contributed meaningfully to explaining the variance in delivery preferences. Pseudo R-square values (Cox & Snell = 0.262; Nagelkerke = 0.283; McFadden = 0.115) suggest a moderate level of explanatory power, which is typical for models of consumer behaviour. A summary can be found in Table 2. The complete regression output, including all parameter estimates and significance levels, is provided in Annex A.

Most notably, attitudinal cluster membership emerged as the strongest individual predictor in the model ($\chi^2 = 1559.109$, $df = 9$, $p < .001$). Compared to socio-demographic variables, the behavioural segmentation provided considerably more explanatory value. This finding confirms that underlying attitudes, particularly toward sustainability in e-commerce, are more closely linked to behavioural outcomes than traditional demographic indicators.

The parameter estimates further clarified the associations between specific attitudinal clusters and delivery preferences. Careless consumers were 43 times more likely to fall into the price-sensitive and 25.7 times in the location-driven segment, reflecting a cost- and convenience-driven orientation. They

are also the least likely to be in the sustainability-driven segment. Ignorant and uncommitted consumers are also significant less likely to be in the sustainability-driven segment but less strong as the careless consumers. They are moderately distributed across the location-driven, service-oriented and price-sensitive segments. In contrast, pro-sustainable consumers were significantly more likely to belong to the sustainability-driven segment (43 times more likely compared to the careless consumers and around 5 times more compared to the ignorant and uncommitted consumers), indicating a strong alignment between their attitudes and behavioural delivery choices.

Socio-demographic variables also contributed to the model, though to a lesser extent. Younger consumers were more likely to be price-sensitive, suggesting that age influences cost-consciousness in delivery behaviour. Higher levels of education were associated with a greater likelihood of choosing sustainability-driven options, indicating a possible link between education and environmental engagement. Consumers who regularly use home delivery as delivery option are more likely to belong to the location-driven segment. Country differences also emerged. Respondents from the Netherlands and Belgium were more likely to fall into the price-sensitive group, while Swedish respondents were more strongly associated with sustainability-driven preferences. These cross-national differences may reflect variations in market structures, policy environments, or public awareness of sustainable delivery. By contrast, the presence of children in the household did not significantly predict delivery preferences ($p = 0.121$). These findings provide a basis for refining the consumer personas, which are further developed and described in the following section.

5 Persona

The main objective of this deliverable is to identify consumers group suited to different behavioural change strategies in the context of sustainable e-commerce. To do so, four different consumer personas have been identified by building further on the research by Verplanken (2018), findings from Cauwelier et al. (2024) and enriched with results from Deliverables 2.2 (Pernot et al., 2025), 2.3 (Phillips & Pernot, 2025) and 2.5 (Cauwelier et al., 2025). The profiles are characterized by differences in motivation, perceived opportunity for engaging in sustainable behaviour as well as their habits. These personas reflect psychological, social factors that drives behaviour and consider the practical barriers that influence the decision-making in the context of e-commerce and sustainability. Since research on demographic characteristics is contradictory (Caspersen & Navrud, 2021) and seems not be as important of an explanatory factor (see section 4.2), these are limited in the current description of the personas.

5.1 The pro-sustainable consumer

The pro-sustainable consumer combines strong environmental awareness with high motivation and a clear perception of their ability to act sustainably. This places them in the high motivation / high opportunity quadrant of Verplanken's (2018) framework. These individuals not only value sustainability in e-commerce but also feel confident in aligning their delivery and return behaviours with those values. They are typically in the action or maintenance stage of the Transtheoretical Model of Change (Prochaska & Velicer, 1997), having already adopted sustainable practices and actively seeking to maintain or improve them.

Evidence from Deliverable 2.5 confirms this alignment: Pro-Sustainable Consumers are strongly overrepresented in the sustainability-driven segment, with an odds ratio 43 times higher than that of Careless Consumers. This segment includes consumers whose choices are mainly driven by the option to choose for a sustainably delivery partner. The other delivery attributes are secondary and typically aligned with more sustainable alternatives. Their behaviour reflects similar findings in the literature: for instance, Trailblazers in Buldeo Rai et al. (2021) and Class 2 consumers in Caspersen and Navrud (2021), both of whom prioritise sustainability over speed and cost.

An example of this persona is Giulia, who chooses to pick up the products she orders directly from the brand's shops to avoid adding more delivery trucks to the city. Her example highlights both her awareness of delivery-related issues and her strong motivation to make sustainable choices.

“So I prefer not to have delivery at home because I think more items go to the shop. So I think it's more ecological if I go to the shop and pick it up, rather than them bringing it to my home. Fundamentally, I choose this because I think it's better that more merchandise goes to the shop so there are fewer vehicles driving around the city.” – Giulia (interviewed in T2.2)

Their behavioural patterns are often underpinned by intrinsic motivation, as described in self-determination theory (Deci & Ryan, 1985). These individuals act sustainably because it aligns with their values, not for external rewards. Informational cues such as green labels reinforce their identity rather than merely serving as nudges (Agatz et al., 2021). For example, Agatz et al. (2021) found that eco-conscious consumers responded more strongly to green labels than to price incentives, particularly when selecting longer and less convenient time slots.

Nevertheless, they still benefit from clear, transparent information and continued structural support to sustain this behaviour. Their behaviour is not static; maintaining it requires reinforcement and validation, particularly as convenience and speed remain powerful competing drivers in the e-commerce landscape (Allen et al., 2018).

5.2 The uncommitted consumer

The uncommitted consumer is characterised by a relatively high level of awareness and opportunity but a lack of motivation to engage in sustainable delivery behaviours. While these individuals understand the environmental implications of their choices and belief to have access to alternatives, they do not consistently prioritise sustainability in practice. This profile corresponds to Verplanken's (2018) high opportunity / low motivation quadrant, highlighting that awareness and availability alone are not sufficient to drive behavioural change.

In Deliverable 2.5, uncommitted consumers are distributed across multiple delivery preference segments, with notable presence in the price-sensitive, location-driven, and service-oriented segments. This mixed pattern suggests a consumer group that values convenience and affordability, but without a strong commitment to sustainable options. Their behaviour resonates with Gawor and Hoberg's (2018) balanced buyers, who seek compromises between cost, speed, and convenience, and with the value-for-money segments identified in Nguyen et al. (2019).

The example of Jeroen illustrates well the Uncommitted Consumer persona: he is aware of the most sustainable delivery option but still not adapt his behaviour accordingly. He already knows that he could choose to be delivered in pickup points and cycle there to collect his parcels, but he still chooses home delivery because it is more convenient and costs the same price.

“Every time someone has to drive from like a pickup point to your house, of course, it's extra kilometres. [...] So, it would be more sustainable to [deliver] it at a pickup point and cycle there all the time. I don't do that. I was thinking of doing it maybe later, like with the next purchase. Let's say if I had to pay two euros extra, to get it delivered at my house, I would not do it. I would just place it at a pick-up point and cycle there. But because it's free, and the other one is also free, it's quite a no-brainer for me to have it at your house instead of going somewhere to pick it up. [...] So yeah, I'm definitely thinking of it, but there's a difference between thinking of it and really making a different decision. I'm somewhere in the middle now and I hope that I'm going to be there at one point.” – Jeroen (interviewed in T2.2)

Such as Jeroen, this group is likely to experience internal hesitation, aware of sustainability issues but lacking either a compelling personal motive or social pressure to act on them. This hesitation places them in the contemplation or preparation stage of the Transtheoretical Model (Prochaska & Velicer, 1997), where intentions may form but are not yet translated into consistent action. As studies like Agatz et al. (2021) and White et al. (2019) suggest, combining extrinsic motivators (e.g. price incentives, green labels) with social cues or simplified sustainable defaults may help nudge these consumers toward action. Because these individuals already perceive the possibility of acting sustainably, effective

interventions could focus on boosting motivation through emotional engagement, positive framing, or demonstrating that others like them are already making sustainable choices.

5.3 The ignorant consumer

The ignorant consumer is marked by a moderate level of motivation to behave sustainably, but low awareness and limited perceived opportunity to do so. They may care about environmental issues in principle, but lack sufficient knowledge, cues, or confidence to translate their values into action. As such, they fall into Verplanken's (2018) high motivation / low opportunity quadrant, where behavioural change is held back not by attitude, but by situational and structural barriers. This group may want to act more sustainably but feels disempowered by a lack of clear, actionable options or by the complexity of the decision-making environment. This is precisely what Jacob describes in the quote below.

"If I have no clue that one [delivery option] is more sustainable than the other or better for the planet or for the environment, then I'll choose for myself and take the quickest, easiest route. But if it's clear that, well, if you choose a pickup point delivery and it said it's five times more sustainable than choosing delivery at home maybe I'm more likely to choose that because it doesn't really matter for me it's just it's easier for the other option but I'm also willing to put [aside] something [for] myself and choose for a little worse option if it contributes in a greater sense of things." – Jacob (interviewed in T2.2)

Data from Deliverable 2.5 shows that ignorant consumers are most frequently located in the service-oriented and location-driven segments, and to a lesser extent in the sustainability-driven segment. This suggests a preference for convenience and flexibility, perhaps reflecting a desire to do the right thing, but only when it aligns with ease or is clearly signposted. Their pattern of behaviour is comparable to E-opportunists described by Buldeo Rai et al. (2021), who favour convenience over sustainability, and to the Class 3 consumers in Caspersen and Navrud (2021), who value fast delivery despite environmental concerns.

From a behavioural perspective, these consumers may be in the contemplation or preparation stages of the Transtheoretical Model (Prochaska & Velicer, 1997). They are beginning to recognise the importance of change and may be open to sustainable options, but only if barriers such as unclear information, lack of availability, or decision fatigue are reduced. Gifford (2011) identifies limited cognition and mistrust as psychological barriers particularly relevant for this group, who might not fully grasp the impact of their delivery choices or might question whether "green" options are genuinely effective.

Therefore, interventions for the ignorant consumer should aim to increase perceived opportunity by simplifying decision environments, enhancing transparency, and building trust. This could include clearer environmental labelling (Buldeo Rai et al., 2021), greater visibility of sustainable options, and positive social proof. Retailers and logistics providers play a crucial role here: by improving structural access to greener choices — such as expanding parcel locker networks (Molin et al., 2022), or defaulting to sustainable slots (Mitchell et al., 2022) — they can convert latent motivation into real-world behaviour.

5.4 The careless consumer

The careless consumer is characterized by minimal awareness of and little to no motivation for the sustainability implications of their e-commerce behaviour. They do not perceive sustainability concerns as important and therefore do not feel capable of changing their behaviour. As such, they are unlikely to engage in sustainable practices unless structural changes in the system significantly alter the options. This profile corresponds closely with the low motivation/low opportunity quadrant in Verplanken's (2018) behavioural change framework.

Empirical data from Deliverable 2.5 shows that careless consumers are most likely to be found in the price-sensitive delivery segment and, to a less extent, the location-driven segment. This is clearly illustrated in the quote below, where Ella explains that her delivery choices are guided by cost, with the lowest cost being her top priority.

“It really just depends on what the shipping cost is. So, I kind of choose based on the cheapest option. Yeah, price often plays a role in which method you choose.” – Ella (interviewed in T2.2)

This preference for low-cost and home delivery options aligns with the segmentation research, including the budgeters described by Gawor and Hoberg (2018) and the price-oriented profile identified by Nguyen et al. (2019). For this profile, delivery price is by far the most important attribute outweighing environmental concerns or service-related features.

From a behavioural psychology perspective, these consumers likely behave on habitual decision-making (system 1 thinking), reinforced by the frequent availability of cheap or even free delivery options (Kahneman, 2011; Mazar & Wood, 2018). They are unlikely to have experienced meaningful rationales or cues questioning their actual behaviour. This aligns with the precontemplation stage of the Transtheoretical Model of Change (Prochaska & Velicer, 1997), in which individuals are not yet considering behavioural change and may even be unaware that change is necessary. Therefore, this segment may be the least likely to change voluntarily since motivation is absent and unsustainable choices are easily accessible, reinforcing their habits. As Verplanken and Orbell (2022) argue, habits form the strongest barrier to sustainable behaviour when motivation is lacking, and alternatives are not easily accessible. For interventions based on attitudinal change to be effective, sustainable delivery choices must be made tangible for consumers— meaning the information should feel personally relevant, either by directly affecting them or impacting others they care about. Enhancing the accessibility of sustainable options, whether through expanding the range and availability of sustainable choices or incorporating implementation intentions, may also support sustainable choices.

However, alternative intervention strategies can be considered that do not rely on moving consumers through the stages of the Transtheoretical Model (Prochaska & Velicer, 1997) through attitude change. In this regard, extrinsic incentives such as price discounts or default nudges (e.g. pre-selecting slower, cheaper delivery) should also be effective strategies (Agatz et al., 2021; White et al., 2019; Verplanken, 2018).

In the Table 2 below an overview of the four personas can be found.

Table 2: Overview of consumer persona

Persona	Motivation	Opportunity	Preference	Stage of change	Decision drivers	Barriers	Effective behavioural change interventions
Pro-sustainable	High	High	Sustainability-driven	Action or Maintenance	Environmental and social values	Convenience, competing priorities	Transparent info, continued reinforcement
Uncommitted	Low	High	Home delivery-focused and price-sensitive	Contemplation	Price and convenience	Weak motivation	Extrinsic motivators, social cues, positive framing
Ignorant	Moderate	Low	Service-oriented and home delivery-focused	Contemplation or Preparation	Convenience	Information gaps, mistrust	Simplified decisions, clearer labels, visibility
Careless	Low	Low	Price-sensitive	Precontemplation	Cost, habit	Disinterest, no perceived need	Tangibility or accessibility campaigns, implementation intentions, financial and structural nudges

6 Discussion

While Deliverable 2.5 (Cauwelier et al., 2025) is based on an experimental setting where sustainability information is conveyed together with the type of carrier, Deliverables 2.2 (Pernot et al., 2025) and 2.3 (Phillips & Pernot, 2025) demonstrate that such information is rarely available in real-life contexts. As a result, consumers often do not consider sustainability when selecting delivery options. When they do attempt to account for it, they typically rely on assumptions rather than concrete information about which option is most sustainable. The findings from D2.5 indicate that the choice of delivery partners (with information on sustainability provided) ranks just after delivery price in terms of what consumers value and prioritize. The complementarity of the results from these deliverables illustrates the potential of providing clearer information on retailers' websites to influence consumer decisions in a more sustainable direction.

Regarding the personas, they are derived from a cluster analysis based on attitudinal profiles and behavioural patterns. As illustrated by the verbatim excerpts associated with each persona in Section 5, these profiles align with the experiences of several consumers interviewed in other tasks within the work package (WP). However, while personas aim to simplify complex realities and segment online consumers into broad categories, the interviews reveal a greater diversity and complexity in both consumers and ordering situations. This does not imply that the two approaches are incompatible. On the contrary, they are complementary, and when combined, they provide a more nuanced and comprehensive understanding of online consumer behaviour.

As noted, the personas incorporate certain characteristics, i.e., attitudes and behaviours. However, they do not account for situational factors, such as the urgency with which consumers need their parcels, or the size of the parcel. Findings from D2.3 highlight the significance of these real-world constraints, as they shape how consumers weigh sustainability against other goals, such as cost, convenience, speed, and safety, ultimately influencing their delivery choices. This is a critical nuance when considering the "pro-sustainable" consumer, as interview data provides limited evidence that such consumers consistently choose sustainable delivery options. Constraints, lack of information, or simply not considering sustainability in the decision-making process often play a role. So even with high motivation and high opportunity, these consumers are not always making sustainable delivery choices and prioritize other goals in some contexts.

The interviews also reveal that consumer behaviour evolves over time, influenced by personal life events and social networks. In contrast, the personas offer a more static view, assuming consumers remain within a single category. Recognizing these dynamic influences is essential for a fuller understanding of behaviour over the long term.

Moreover, while personas assume that consumers fit into a single profile, awareness levels can vary across topics, suggesting that individuals may fit in the "pro-sustainable" or "uncommitted" groups, with high awareness level (captured by high opportunity) in some delivery contexts and in the "ignorant" or "careless" groups in others (as evidenced in D2.2). The interviews further reveal that most consumers lack a comprehensive understanding of the broader implications of e-commerce deliveries and could, to varying extents, be categorized within the "ignorant" group.

Trust also emerges as a central theme that is not accounted for in the personas. Interviews underscore the importance of trust in sustainability-related messages from retailers. Trust is shaped not only by the message and the retailer's credibility but also by the consumer's awareness and sensitivity to potential greenwashing.

Finally, the perception of sustainability itself is highly varied among consumers. While some focus on environmental concerns, others are more attuned to social issues or safety. This diversity suggests that the "pro-sustainable" persona is not a homogeneous group. The very definition of sustainability can shift the boundaries of this consumer segment.

In summary, the combined insights from survey results, qualitative interviews, and persona development underscore the importance of context, information, and consumer diversity in shaping delivery choices. While personas offer a useful framework for segmenting and understanding consumer types, interviews reveal the variability and complexity of real-life decision-making. Situational

constraints, evolving awareness, and trust dynamics all play a critical role in how sustainability considerations are prioritized. Together, these findings reinforce call for more tailored communication and policy strategies to effectively promote sustainable delivery choices.

7 Conclusions

This deliverable's goal was to identify consumer profiles suited to different behavioural change strategies in the context of sustainable last-mile delivery and return choices. The approach combined a desk study of behavioural and logistics literature with empirical data drawn from a large-scale survey (Deliverable 2.5) and qualitative interviews (Deliverables 2.2 and 2.3). The aim was to uncover how psychological, attitudinal, and contextual factors shape consumer behaviour.

Based on this mixed-method approach, four personas were identified, i.e., Careless, Ignorant, Uncommitted, and Pro-sustainable, that represent distinct profiles of motivation, awareness levels, and behavioural habits regarding (sustainable) e-commerce delivery and return choices. These profiles help explain the variability in delivery preferences and consumers' differing responsiveness to sustainability cues.

The findings indicate that sustainable behaviour in the e-commerce context cannot be fully understood through socio-demographic variables alone. While Pro-sustainable consumers align their choices with environmental values, Ignorant and Uncommitted consumers highlight the disconnect between intention and behaviour, stemming from either a lack of motivation or barriers such as limited awareness, decision fatigue, or mistrust. Careless consumers are disengaged altogether, suggesting that more structural interventions may be required.

Quantitative results confirm that these attitudinal profiles are strong predictors of delivery preferences, outperforming socio-demographic variables. At the same time, qualitative findings show that behaviour is not static. It is shaped by everyday constraints, interface design, trust in messaging, and changing personal circumstances. Even highly motivated consumers may not act sustainably in practice unless choices are made clear, credible, and convenient.

Some limitations should be acknowledged. The personas provide simplified models that may not capture the full complexity or situational variability of individual behaviour. Consumer behaviour often shifts depending on urgency, product type, or experience. Furthermore, while the concept of opportunity includes both structural and cognitive elements, this deliverable focused primarily on the cognitive dimension rather than on the availability of infrastructure. As such, structural barriers were not comprehensively addressed. Additionally, although the dataset covers multiple countries, further investigation into cross-cultural and regional variation would strengthen future research.

Despite these limitations, the persona offers a practical tool for guiding interventions. Retailers can use it to tailor platform design, delivery offerings, and messaging. Local authorities and policymakers can develop incentives, nudges, and regulatory levers that reduce barriers and promote sustainable choices at scale.

Ultimately, advancing sustainable last-mile delivery requires more than raising awareness. It calls for a behavioural strategy that reflects how consumers actually make decisions, under constraints, in routines, and with competing priorities. By aligning interventions with these realities, the insights from this deliverable contribute directly to the communication guidelines and behavioural change tools to be developed in the next stages of the CodeZERO project.

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Annex A: Multinomial logistic regression parameter estimates

Model fitting information: Here we can see that the model fits significantly better and improves prediction compared to the intercept only model:

Model	Model fitting criteria - 2log Likelihood	Likelihood ratio tests		
		Chi-square	Df	Sig.
Intercept only	25521.876			
Final	22483.886	3037.990	108	< .001

Pseudo R-square: The model explains between 11.5% and 28% of the variance.

Pseudo R-square	
Cox and Snell	0.262
Nagelkerke	0.283
McFadden	0.115

Likelihood ratio tests for predictors: Here we can see that all variables have a significant effect ($p < 0.05$) with exception of having children ($p = 0.121$) on predicting delivery preference segments.

Model	Model fitting criteria - 2log Likelihood	Likelihood ratio tests		
		Chi-square	Df	Sig.
Intercept only	22483.886	.000	0	.
Attitudinal cluster	24042.995	1559.109	9	< .001
Country	22752.149	268.263	27	< .001
Gender	22569.859	85.973	3	< .001
Age Category	22704.462	220.576	15	< .001
Education level	22641.025	157.139	6	< .001

Model	Model fitting criteria - 2log Likelihood	Likelihood ratio tests		
Living environment	22501.847	17.960	6	0.006
Occupation	22522.268	38.382	9	< .001
Children	22489.693	5.807	3	0.121
Purchase volume	22548.855	64.969	18	< .001
Delivery option	22761.854	277.968	12	< .001

Parameter estimates

		Parameter Estimates						95% Confidence Interval for Exp(B)	
LCASegmentsFullSample ^a		B	Std. Error	Wald	df	Sig.	Exp(B)	Lower Bound	Upper Bound
Price-sensitive consumers	Intercept	-.831	.319	6.775	1	.009			
	[TwoStep Cluster Number=1]	3.842	.157	600.188	1	<.001	46.632	34.291	63.414
	[TwoStep Cluster Number=2]	1.655	.080	424.368	1	<.001	5.235	4.472	6.128
	[TwoStep Cluster Number=3]	1.542	.070	490.994	1	<.001	4.674	4.078	5.357
	[TwoStep Cluster Number=4]	0 ^b	.	.	0	.	.	.	.
	[Country=1]	.726	.135	29.040	1	<.001	2.068	1.588	2.693
	[Country=2]	.284	.132	4.619	1	.032	1.329	1.025	1.722
	[Country=3]	.672	.134	25.264	1	<.001	1.958	1.506	2.544
	[Country=4]	.767	.132	33.628	1	<.001	2.153	1.661	2.790
	[Country=5]	.387	.128	9.097	1	.003	1.473	1.145	1.895
	[Country=6]	-.251	.134	3.482	1	.062	.778	.598	1.013
	[Country=7]	.040	.136	.086	1	.769	1.041	.797	1.358
	[Country=8]	.143	.136	1.097	1	.295	1.154	.883	1.507
	[Country=9]	.411	.142	8.338	1	.004	1.508	1.141	1.994
	[Country=10]	0 ^b	.	.	0	.	.	.	.
	[Gender=1]	.173	.058	8.991	1	.003	1.189	1.062	1.331
	[Gender=2]	0 ^b	.	.	0	.	.	.	.
	[AgeCat=1]	-1.052	.163	41.825	1	<.001	.349	.254	.480
	[AgeCat=2]	-1.054	.152	48.211	1	<.001	.349	.259	.469
	[AgeCat=3]	-.467	.151	9.605	1	.002	.627	.467	.842
	[AgeCat=4]	-.176	.148	1.419	1	.233	.838	.628	1.120
	[AgeCat=5]	-.043	.140	.095	1	.758	.958	.728	1.260
	[AgeCat=6]	0 ^b	.	.	0	.	.	.	.
	[EducationLevel=1]	-.827	.091	81.815	1	<.001	.437	.366	.523
	[EducationLevel=2]	-.146	.064	5.205	1	.023	.864	.763	.980
	[EducationLevel=3]	0 ^b	.	.	0	.	.	.	.
	[LivingEnvironment=1]	-.043	.082	.277	1	.599	.958	.815	1.125
	[LivingEnvironment=2]	-.118	.087	1.833	1	.176	.889	.749	1.054
	[LivingEnvironment=3]	0 ^b	.	.	0	.	.	.	.
	[Occupation=1]	.025	.161	.024	1	.877	1.025	.748	1.405
	[Occupation=2]	-.105	.132	.640	1	.424	.900	.695	1.165
	[Occupation=3]	.059	.163	.130	1	.718	1.061	.770	1.461
	[Occupation=4]	0 ^b	.	.	0	.	.	.	.
	[Children=1]	-.092	.064	2.080	1	.149	.912	.805	1.034
	[Children=2]	0 ^b	.	.	0	.	.	.	.
	[PurchaseVolume=1]	-.059	.182	.106	1	.745	.943	.660	1.346
	[PurchaseVolume=2]	-.096	.154	.388	1	.533	.908	.672	1.229
	[PurchaseVolume=3]	-.120	.125	.912	1	.340	.887	.694	1.134
	[PurchaseVolume=6]	-.100	.096	1.091	1	.296	.904	.749	1.092
	[PurchaseVolume=12]	.082	.087	.887	1	.346	1.085	.916	1.286
	[PurchaseVolume=26]	.021	.096	.047	1	.829	1.021	.846	1.232
	[PurchaseVolume=52]	0 ^b	.	.	0	.	.	.	.
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =1]	.429	.215	3.981	1	.046	1.536	1.008	2.340
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =2]	.496	.220	5.099	1	.024	1.642	1.068	2.525
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =3]	.188	.253	.549	1	.459	1.206	.734	1.981
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =4]	.646	.227	8.111	1	.004	1.908	1.223	2.976
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =5]	0 ^b	.	.	0	.	.	.	.

Home delivery focuses consumers	Intercept	-1.002	.423	5.608	1	.018			
	[TwoStep Cluster Number=1]	3.269	.172	362.333	1	<.001	26.290	18.776	36.811
	[TwoStep Cluster Number=2]	1.442	.102	200.189	1	<.001	4.228	3.463	5.163
	[TwoStep Cluster Number=3]	1.239	.090	187.648	1	<.001	3.451	2.891	4.121
	[TwoStep Cluster Number=4]	0 ^b	.	.	0	.	.	.	.
	[Country=1]	.181	.150	1.444	1	.229	1.198	.892	1.608
	[Country=2]	-.087	.146	.351	1	.553	.917	.688	1.222
	[Country=3]	-.088	.157	.318	1	.573	.915	.673	1.245
	[Country=4]	.088	.150	.346	1	.556	1.092	.814	1.465
	[Country=5]	-.473	.155	9.380	1	.002	.623	.460	.843
	[Country=6]	-.395	.155	6.513	1	.011	.674	.498	.912
	[Country=7]	-.480	.166	8.381	1	.004	.619	.447	.856
	[Country=8]	-.262	.162	2.596	1	.107	.770	.560	1.058
	[Country=9]	-.101	.174	.333	1	.564	.904	.643	1.272
	[Country=10]	0 ^b	.	.	0	.	.	.	.
	[Gender=1]	.053	.072	.554	1	.457	1.055	.916	1.214
	[Gender=2]	0 ^b	.	.	0	.	.	.	.
	[AgeCat=1]	-.998	.190	27.481	1	<.001	.369	.254	.535
	[AgeCat=2]	-1.042	.176	35.004	1	<.001	.353	.250	.498
	[AgeCat=3]	-.732	.175	17.497	1	<.001	.481	.341	.678
	[AgeCat=4]	-.305	.168	3.301	1	.069	.737	.530	1.024
	[AgeCat=5]	-.331	.157	4.420	1	.036	.718	.528	.978
	[AgeCat=6]	0 ^b	.	.	0	.	.	.	.
	[EducationLevel=1]	-.496	.117	18.082	1	<.001	.609	.484	.765
	[EducationLevel=2]	.117	.080	2.124	1	.145	1.124	.961	1.315
	[EducationLevel=3]	0 ^b	.	.	0	.	.	.	.
	[LivingEnvironment=1]	-.338	.100	11.370	1	<.001	.713	.586	.868
	[LivingEnvironment=2]	-.236	.104	5.201	1	.023	.789	.644	.967
	[LivingEnvironment=3]	0 ^b	.	.	0	.	.	.	.
	[Occupation=1]	.160	.186	.733	1	.392	1.173	.814	1.690
	[Occupation=2]	-.307	.156	3.874	1	.049	.736	.542	.999
	[Occupation=3]	-.708	.212	11.173	1	<.001	.493	.325	.746
	[Occupation=4]	0 ^b	.	.	0	.	.	.	.
	[Children=1]	-.109	.081	1.809	1	.179	.896	.764	1.051
	[Children=2]	0 ^b	.	.	0	.	.	.	.
	[PurchaseVolume=1]	-.094	.219	.183	1	.669	.910	.592	1.400
	[PurchaseVolume=2]	-.089	.188	.223	1	.637	.915	.633	1.323
	[PurchaseVolume=3]	-.224	.157	2.038	1	.153	.799	.587	1.087
	[PurchaseVolume=6]	-.199	.121	2.688	1	.101	.820	.646	1.040
	[PurchaseVolume=12]	.043	.109	.154	1	.695	1.043	.844	1.291
	[PurchaseVolume=26]	.074	.120	.383	1	.536	1.077	.851	1.362
	[PurchaseVolume=52]	0 ^b	.	.	0	.	.	.	.
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =1]	1.130	.323	12.207	1	<.001	3.096	1.642	5.835
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =2]	.149	.333	.200	1	.655	1.161	.604	2.229
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =3]	.215	.380	.321	1	.571	1.240	.589	2.611
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =4]	.162	.344	.223	1	.637	1.176	.600	2.307
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =5]	0 ^b	.	.	0	.	.	.	.

Service oriented consumers	Intercept	-.128	.324	.155	1	.693			
	[TwoStep Cluster Number=1]	2.093	.170	151.520	1	<.001	8.107	5.810	11.313
	[TwoStep Cluster Number=2]	1.225	.082	220.978	1	<.001	3.403	2.895	3.999
	[TwoStep Cluster Number=3]	.803	.074	119.182	1	<.001	2.232	1.933	2.579
	[TwoStep Cluster Number=4]	0 ^b	.	.	0	.	.	.	.
	[Country=1]	-.050	.145	.122	1	.727	.951	.716	1.262
	[Country=2]	-.239	.137	3.046	1	.081	.787	.602	1.030
	[Country=3]	-.310	.146	4.531	1	.033	.733	.551	.976
	[Country=4]	.185	.133	1.923	1	.165	1.203	.927	1.562
	[Country=5]	-.528	.138	14.668	1	<.001	.590	.450	.773
	[Country=6]	-.470	.139	11.480	1	<.001	.625	.476	.820
	[Country=7]	-.248	.139	3.176	1	.075	.780	.594	1.025
	[Country=8]	.262	.134	3.845	1	.050	1.300	1.000	1.689
	[Country=9]	.283	.142	4.004	1	.045	1.328	1.006	1.752
	[Country=10]	0 ^b	.	.	0	.	.	.	.
	[Gender=1]	-.351	.062	32.175	1	<.001	.704	.623	.795
	[Gender=2]	0 ^b	.	.	0	.	.	.	.
	[AgeCat=1]	-.239	.180	1.749	1	.186	.788	.553	1.122
	[AgeCat=2]	-.153	.169	.820	1	.365	.858	.616	1.195
	[AgeCat=3]	.134	.169	.625	1	.429	1.143	.820	1.593
	[AgeCat=4]	-.016	.169	.009	1	.924	.984	.707	1.370
	[AgeCat=5]	-.015	.162	.009	1	.926	.985	.717	1.354
	[AgeCat=6]	0 ^b	.	.	0	.	.	.	.
	[EducationLevel=1]	.125	.092	1.869	1	.172	1.133	.947	1.356
	[EducationLevel=2]	.290	.070	17.127	1	<.001	1.336	1.165	1.532
	[EducationLevel=3]	0 ^b	.	.	0	.	.	.	.
	[LivingEnvironment=1]	-.027	.090	.093	1	.761	.973	.815	1.161
	[LivingEnvironment=2]	-.002	.095	.001	1	.981	.998	.828	1.202
	[LivingEnvironment=3]	0 ^b	.	.	0	.	.	.	.
	[Occupation=1]	.180	.176	1.045	1	.307	1.198	.848	1.692
	[Occupation=2]	-.001	.143	.000	1	.993	.999	.755	1.322
	[Occupation=3]	-.222	.177	1.583	1	.208	.801	.566	1.132
	[Occupation=4]	0 ^b	.	.	0	.	.	.	.
	[Children=1]	.038	.067	.318	1	.573	1.038	.911	1.184
	[Children=2]	0 ^b	.	.	0	.	.	.	.
	[PurchaseVolume=1]	-.195	.188	1.066	1	.302	.823	.569	1.191
	[PurchaseVolume=2]	-.591	.171	12.000	1	<.001	.554	.396	.774
	[PurchaseVolume=3]	-.416	.133	9.859	1	.002	.660	.509	.855
	[PurchaseVolume=6]	-.641	.103	39.069	1	<.001	.527	.431	.644
	[PurchaseVolume=12]	-.340	.089	14.558	1	<.001	.712	.597	.847
	[PurchaseVolume=26]	-.240	.098	6.040	1	.014	.787	.650	.953
	[PurchaseVolume=52]	0 ^b	.	.	0	.	.	.	.
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =1]	-.234	.202	1.345	1	.246	.791	.533	1.175
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =2]	-.128	.208	.381	1	.537	.880	.586	1.322
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =3]	.123	.235	.272	1	.602	1.130	.713	1.792
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =4]	.018	.215	.007	1	.934	1.018	.668	1.550
	[In the past six months, which pickup or delivery have you used most often when purchasing products online that are not large or heavy items? =5]	0 ^b	.	.	0	.	.	.	.

a. The reference category is: Sustainability-driven consumers.

b. This parameter is set to zero because it is redundant.