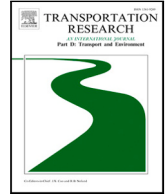


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From rush to responsibility: Evaluating incentives on online fashion customers' willingness to wait

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ABSTRACT

Online retail is characterized by an increasing emphasis on shorter delivery times, which often comes with high logistics costs and a negative environmental impact. Conversely, longer order fulfillment times improve cost and eco-efficiency. This paper investigates whether customers in German-speaking countries are willing to wait longer for their online orders in the fashion, shoes, and accessories sector when offered incentives in return. The research employed an online survey using a within-subjects design. Results indicate that incentives significantly extend customers' patience. Savings on shipping costs and information on the reduction in CO₂ emissions greatly impact willingness to wait. Personal traits like gender, age, eco-awareness, and order urgency affect incentive responses. This demonstrates customers' readiness to make trade-offs in delivery time and emphasizes the importance of explicitly addressing the ecological impact of delivery. Suggestions for online retailers and logistics include slower delivery choices and customized incentives aligned with target audience and market.

1. Introduction

Companies use short delivery times as a marketing argument and advertise next-day or even same-day delivery (Hübner et al., 2016; Joerss et al., 2016). Due to the ease of comparison in e-commerce and the resulting high level of competition, companies prioritize fast delivery to retain or expand their market share (Jaller and Pahwa, 2020). Short delivery times are often perceived as a customer requirement (Allen et al., 2018). Therefore, companies can gain a competitive advantage by offering short delivery times (Gawor and Hoberg, 2019). However, reducing delivery times generally leads to higher logistics costs and externalities (Hua et al., 2010) since home delivery often involves smaller vehicles, which consume more fuel and emit more emissions per ton transported than larger vehicles (Mangiaracina et al., 2015). Additionally, the vehicles are typically not fully loaded, as there are fewer consolidation options due to the short delivery times in e-commerce (Allen et al., 2014). Failed deliveries in the case of home delivery can also result in additional costs and further CO₂ emissions (Voigt et al., 2023). Flexibility in the timing of order fulfillment, particularly with regard to delivery times, can therefore help to reduce delivery costs and the environmental footprint (Voigt et al., 2024).

In the German-speaking region, retailers typically offer only standard deliveries alongside express deliveries. A slower and thus more resource-efficient delivery option is still lacking in the mainstream. During the COVID-19 pandemic, Amazon introduced a slower delivery option called *no-rush shipping* in the United States to avoid delivery bottlenecks and prioritize the shipping of essential goods. Customers who choose the slow shipping option receive a discount or a reward in return. However, this offer has not been extended to other countries so far (Waters, 2020). Besides economic incentives for choosing a slow delivery option,

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customers can potentially be persuaded through targeted information about the ecological impacts of delivery. Not all customers consider short delivery times necessary, or they want to minimize the ecological effects caused by the delivery of their online orders. Currently, customers do not receive comprehensive information about the ecological impacts associated with the chosen delivery option (Ignat and Chankov, 2020). During the online ordering checkout process, the retailer typically only provides information about delivery time and costs (Sallnäs and Björklund, 2020). By making this information available, retailers and logistics service providers can facilitate environmentally friendly and resource-conserving consumption decisions (Sallnäs and Björklund, 2020), as sustainability in the supply chain can only be achieved by involving customers in taking responsibility and developing awareness of their consumption behavior (Jaller and Pahwa, 2020).

By utilizing time potentials, logistical processes can be slowed down, resulting in improved cost and eco-efficiency. Wiese (2017) termed this approach of slowing down logistical activities in the supply chain as “slow logistics”. One concept of slow logistics is presently implemented through the practice of slow-steaming in the maritime transport industry (e.g., Sung et al., 2022; Poulsen et al., 2022). Slow logistics applied to deliveries in e-commerce enables the bundling of delivery orders. This favors, among others, two-echelon delivery concepts, having the potential to reduce emissions (Lemardelé et al., 2023) by using more sustainable means of transportation, such as cargo bicycles. Green parcel-delivery innovations are becoming increasingly important as many cities and metropolitan areas introduce environmental zones and time delivery restrictions that limit the degrees of freedom for deliveries (Tarrío-Ortiz et al., 2023). Third-party logistics service providers therefore need greater time flexibility to fulfill their deliveries. Under these circumstances, however, it is important to know whether and under which conditions customers are willing to wait longer for the delivery of their online orders. Various studies have highlighted the influence of customer and product types on purchasing behavior and the importance of e-fulfillment processes (Nguyen et al., 2018). For instance, price-oriented customers prioritize the lowest price, while comfort-oriented customers value convenience factors, and another segment focuses on the price-performance ratio (Nguyen et al., 2019). Furthermore, consumer expectations regarding e-fulfillment are likely to vary depending on the product type (Nguyen et al., 2018). Hence, it is sensible to examine individual product sectors. In this study, we focus on the fashion, shoes, and accessories market segment, as it is one of the highest revenue-generating segments in German e-commerce and exclusively involves physical products that require delivery (Wollenburg et al., 2018). Additionally, we suspect that the time sensitivity of product delivery in this sector is generally lower compared to items like groceries.

This article conducts an empirical study in order to investigate the customers’ willingness to wait (*w2w*), i.e., whether customers in e-commerce accept a slower delivery option and thus a longer delivery time when provided with ecological information or granted economic incentives. Furthermore, the study analyzes whether ecological and economic incentives differ in their effectiveness. Based on socio-demographic and personal characteristics collected in the study, we also examine whether these factors influence the desired delivery time and whether there are differences in the various incentives concerning these characteristics.

The remainder of this paper is organized as follows. Section 2 discusses related literature and highlights the contribution of our article. Section 3 presents the hypotheses development and the overarching research question. Section 4 details the research design. Section 5 presents the findings. Afterwards, Section 6 discusses the implications and managerial insights. Finally, Section 7 concludes the article by summarizing the results, discussing limitations, and proposing areas for future research.

2. Literature review

The literature review focuses on closely related studies that examine customer preferences for delivery attributes in general, and specifically, the *w2w*.

2.1. Customer preferences for delivery attributes

Several studies investigate the customer preferences for delivery attributes in different markets or segments. The conjoint analysis conducted by Nguyen et al. (2019) focuses on the Netherlands and that of Buldeo Rai et al. (2019) on Belgium, the survey of Nogueira et al. (2021) on Brazilian customers and the conjoint analysis conducted by Gawor and Hoberg (2019) examines delivery attributes in the U.S. electronics market segment for three products in different price categories. All of these studies examine a multitude of delivery attributes and their trade-offs. Some of these attributes are examined in every study such as shipping costs and delivery time but others are included in only few studies such as time windows or delivery location.

2.1.1. Importance of delivery attributes

Shipping costs. The study of Nguyen et al. (2019) places the shipping cost as the most significant delivery attribute, followed by delivery time, time window, and delivery date. The study of Buldeo Rai et al. (2019) confirms that shipping costs are by far the most important delivery attribute. This is followed by return options, delivery time, and delivery location with delivery time windows. In addition to the preference of a free delivery, customers favor a low threshold for shipping costs (e.g., the delivery is free if the purchases are above €25) or subscription services with an annual fee. Gawor and Hoberg (2019) find that not only the shipping costs but the lowest total price (which includes the product price) is the most important attribute for customers.

Delivery time. Buldeo Rai et al. (2019) find that customers show a preference for short delivery times, i.e., delivery the next day, the day after next, or within one to three days. It is evident that the preference for a particular delivery option decreases as delivery time increases. Gawor and Hoberg (2019) place delivery time as the second most important attribute, with a preference for same-day delivery and delivery within 1–2 days. Conversely, longer delivery times receive lower utility values. The significance of delivery time in consumer decision-making increases as the price of the product increases. In contrast to the previously mentioned studies, the survey of Nogueira et al. (2021) with Brazilian customers finds that delivery time is the most important factor, followed by shipping costs, and then ecological information.

Other delivery attributes. The study by [Nguyen et al. \(2019\)](#) reveals that delivery time window, and delivery date are also important, but far less than the aforementioned delivery attributes costs and time. The option to select daytime or evening delivery is considered least important. The survey of [Nogueira et al. \(2021\)](#) shows that a higher proportion of respondents indicate that the influence of ecological information on their purchasing behavior is low, compared to those who consider it to have a high influence.

2.1.2. Trade-off between delivery attributes

[Nguyen et al. \(2019\)](#), [Nogueira et al. \(2021\)](#), [Buldeo Rai et al. \(2019\)](#), [Gawor and Hoberg \(2019\)](#) all find that there is a trade-off between delivery attributes. For instance, although customers want to pay the lowest shipping costs, they are also willing to pay a premium if it means faster delivery, a shorter time window, or a more suitable delivery moment ([Nguyen et al., 2019](#)). These preferences do not allow for shipment consolidation and lead to negative impacts on the environment. It also highlights the challenge of this study to explore the trade-off involving a longer delivery time when short delivery times are highly valued by customers. Furthermore, it emphasizes the importance that incentives can take to influence the direction of the trade-off. According to [Buldeo Rai et al. \(2019\)](#) customers are indifferent to delivery time and delivery location, as long as delivery and returns are free of charge. This trade-off is particularly relevant to our present work, as it suggests that shipping costs can be used as a lever to increase customers' w2w. [Gawor and Hoberg \(2019\)](#) find that customers are even willing to pay more if the delivery time is shorter, or contrary, if the delivery time is longer, expect a lower total price. This trade-off suggests that price can be utilized as a lever to increase customers' w2w. Above monetary considerations, the survey of [Nogueira et al. \(2021\)](#) indicates that ecological information can positively contribute to increased flexibility regarding delivery time and shipping costs.

2.2. Customers' willingness to wait

There are few studies explicitly analyzing the customers' w2w. Again, these studies focus on specific countries (Belgium, [Buldeo Rai et al., 2021](#)) or specific sectors/companies (Mexican retailer, [Fu and Saito, 2018](#)), (fashion-sharing, [Caspersen and Navrud, 2021](#)).

2.2.1. Non-monetary incentives

In Belgium, [Buldeo Rai et al. \(2021\)](#) investigate how non-financial incentives influence the choice between next-day delivery and a more sustainable delivery option with three days delivery time. Non-financial incentives include (1) informing customers about reduced truck usage and kilometers driven with longer delivery times, (2) prioritizing the sustainable delivery option at the top of the choice list, (3) allowing social media sharing of delivery decisions, and (4) highlighting the social norm of 1,000 people choosing the sustainable option. (1) and (3) have a medium effect, (2) has a weak effect, and (4) has the strongest effect.

The study by [Ignat and Chankov \(2020\)](#) finds that customers are willing to wait longer, pay more, and choose a less preferred delivery location when informed about the environmental or social impact of the deliveries. However, the results regarding sustainable delivery options with longer delivery times and cost advantages are not clear-cut. The proportion of participants choosing longer delivery times with a cost advantage is higher before the CO₂ emissions associated with delivery are disclosed. Conversely, when the specific CO₂ emissions related to delivery are provided upfront, along with a cost benefit, more customers opt for the longer delivery time. The results of the study do not refer to any specific country.

[Caspersen and Navrud \(2021\)](#) analyze consumer preferences towards ecological last-mile deliveries within the fashion-sharing sector. The researchers conducted an internet panel survey exclusively among female respondents from Norway. Their findings reveal that these respondents display unfavorable views regarding delivery delays, local air pollutants, and CO₂ emissions. Notably, the study suggests that these female consumers exhibit a willingness to accept extended delivery duration if it contributes to emission reduction. They did not include any other incentive. In a similar setting, [Caspersen et al. \(2022\)](#) investigate the willingness to pay for environmentally-friendly last mile deliveries. Although the study does not explicitly define the criteria for environmentally-friendly deliveries, the findings highlight the readiness of Norwegian females to pay for a reduction of CO₂ emissions in the delivery process.

2.2.2. Monetary and non-monetary incentives

The study of [Fu and Saito \(2018\)](#) is the only one that investigates both types of incentives on the customers' w2w. In the context of a Mexican retailer, participants of the survey are asked about their w2w without any incentive, with an unspecified economic incentive, and various ecological information as incentives. The ecological information includes factors such as CO₂ emissions, waste recycling, tree seedlings, and household electricity. The study reveals that 50% of customers are willing to wait longer without any incentive, while 70% are willing to wait with an economic incentive, and 71% are willing to wait with an environmental incentive. Among the ecological incentives, tree seedlings perform the best. It is worth noting that the ecological incentives selected in the study are not based on the direct impact of delivery, and thus participants tend to greatly overestimate the actual ecological effect of their decision.

2.3. Summary and research gap

The studies indicate that customers predominantly prioritize shipping costs and delivery time. Other attributes, like return options, delivery time windows, and ecological information play a less important role. Economic incentives, such as lower prices or discounts, can increase the w2w. Similarly, non-financial incentives, including environmental information and social norms, can also impact their choices. Customers demonstrate a trade-off between faster delivery times and cost advantages, indicating that price can be leveraged to extend delivery time.

However, there are some research gaps that need to be addressed. First, there is a lack of studies that comprehensively evaluate the effectiveness of incentives in changing customer preferences towards sustainable delivery options. Second, the variation in delivery attributes examined across different studies limits the ability to directly compare and relate these attributes. Third, ecological information as a delivery attribute is not extensively examined in the existing studies. Fourth, the studies to date focus on specific markets and regions, so that generalization and transfer to other markets, e.g., the German market, may not be directly possible. Last, the previous studies neglect the customers' environmental awareness, which may have a noticeable influence on the customers' w2w.

In summary, while existing studies provide valuable insights into customer preferences and w2w, there is a need for more research on the effectiveness of incentives, the inclusion of ecological information as a delivery attribute, the consideration of cultural and market segment differences, as well as the environmental awareness of customers. The proposed study aims to contribute to filling these research gaps by examining customer preferences and w2w in the German-speaking fashion, shoes, and accessories sector.

3. Hypotheses development on customer' willingness to wait

This section focuses on the development of hypotheses regarding customers' w2w. In Section 3.1, we examine diverse factors that may influence customer behavior in this context including delivery attributes, personal characteristics, and means of changing customer preferences. Based on these factors, we develop in Section 3.2 the hypotheses to answer our research question.

3.1. Factors influencing customer behavior

3.1.1. Delivery attributes

Delivery attributes have been found to influence customer behavior (Nguyen et al., 2018). The following attributes are important in e-commerce delivery.

Shipping costs can be used as a marketing tool to influence consumer decision-making or to cover logistics costs (Nguyen et al., 2018). The following four concepts can be distinguished.

- Free shipping.
- Fixed shipping fee.
- Threshold-based shipping costs, where delivery is free of charge if the customer exceeds a certain threshold in her/his order, otherwise a fixed shipping fee is applied (Nguyen et al., 2019).
- Subscription services against an annual fee, such as Amazon Prime, where free deliveries are provided in addition to other benefits (Buldeo Rai et al., 2021).

Ecological impact of delivery, for example, by indicating the CO₂ emissions caused (Ignat and Chankov, 2020), represents another possible delivery attribute (Nogueira et al., 2021).

Delivery time refers to the duration between the order and the delivery of the product. It can be measured in terms of punctuality and speed of delivery (Nguyen et al., 2019).

Delivery location options include home delivery with customer receipt, home delivery with drop-off, and the use of manned or unmanned pick-up points such as post offices, gas stations, or packing stations (Nguyen et al., 2018). Some online retailers with physical stores also offer the option of picking up the order in a local store.

Delivery flexibility encompasses several factors, like the choice of delivery day, delivery time window (Nguyen et al., 2019), or the choice of logistics service provider (Esper et al., 2003).

Order tracking allows customers to regularly check and track the status of their orders (Nguyen et al., 2019).

3.1.2. Person characteristics

Socio-demographic and -behavioral characteristics of customers have been found to influence their preferences for delivery attributes (Nguyen et al., 2019) and for the adoption of environmental friendly delivery (Kader et al., 2022). Therefore, these characteristics are assumed to be relevant in relation to increasing the w2w. The socio-demographic characteristics considered are derived from the studies of Fu and Saito (2018) and Nguyen et al. (2019), regardless of whether they demonstrated an influence in the respective studies. It is assumed that these characteristics may have an impact in a different country or market segment. Additionally, the environmental awareness of individuals is taken into account, as Deliana and Rum (2019) demonstrate that it influences customer behavior in general.

3.1.3. Change of customer preferences

Behavior can be influenced through incentives, drawing upon the psychological theory of nudging. Nudging aims to alter incentive systems and settings to make the desired alternative action more likely to be chosen. Shipping costs have been identified as effective leverage for extending delivery time (Buldeo Rai et al., 2019), and therefore, they are included as a main incentive in this study. It is assumed that price-oriented and price-performance-oriented customers can be targeted with this incentive. To appeal to convenience-oriented customers, the provision of delivery flexibility is investigated as another incentive. Flexibility can be achieved through allowing the customer to choose the delivery day, delivery time window, and parcel service provider. Note that we assume that customers consider order tracking as a standard service and therefore this delivery attribute cannot be used to influence the w2w.

Behavioral change in e-commerce can also be realized by incorporating ecological attributes in the selection of delivery options, thereby promoting sustainable choices (Penz et al., 2019). This approach aligns with the psychological theory of planned behavior, which posits that a person's attitude towards behavior, subjective norms, and perceived control of action influences behavioral intention.

3.2. Research question and working hypotheses development

The central question we aim to answer is whether customers in the fashion, shoes, and accessories sector are willing to wait longer for their online orders when offered economic or ecological incentives in return. H1 assumes that incentives impact the w2w. H2 assumes that there is a difference in effectiveness between economic and ecological incentives. Furthermore, H3 assumes that person characteristics influence the w2w. Lastly, H4 assumes that the importance of delivery attributes influences the w2w. The hypotheses are as follows.

- **H1:** Economic or environmental incentives impact the w2w.
 - **H1a:** If customers are offered saving 200 g CO₂ emissions on delivery, they are willing to wait longer.
 - **H1b:** If customers are offered saving 1€ on shipping costs, they are willing to wait longer.
 - **H1c:** If customers are offered to flexibly arrange delivery by choosing the delivery day, delivery time window and parcel service provider, they are willing to wait longer.
- **H2:** The w2w varies for the economic or environmental incentives.
- **H3:** Socio-demographic, personal or order characteristics, specifically gender, generation, income, education level, type of residence, environmental awareness, or urgency of order influence the w2w.
- **H4:** The delivery attributes of shipping costs, environmental impact, delivery time, delivery location, delivery day, morning delivery, afternoon delivery, evening delivery, or choice of parcel service provider impact the w2w.

4. Methodology

4.1. Research design

To address the research question and hypotheses, we conduct an empirical study. The study sought to determine the impact of incentives on w2w, comparing their effectiveness and exploring influencing factors. We chose a within-subjects design with repeated measurements. It consists of one control condition (0) and three experimental conditions (1–3): (0) *No incentive*, (1) *CO₂ emission savings as incentive*, (2) *Shipping cost savings as incentive*, and (3) *Delivery flexibility as incentive*.

The within-subjects design allows us to assign the same test subjects to the control condition and the three experimental conditions. Participants go through the control condition first, followed by the three experimental conditions in a randomized order. This design not only enables us to study the effect of the incentives compared to the control condition but also the interactions between the different incentives. It also minimizes the influence of person-related confounding variables, as the same individuals are examined in each condition. However, we acknowledge the potential drawbacks of the within-subjects design, such as overload, fatigue, and learning effects.

4.2. Survey design

4.2.1. Scales

The rating scales of the present questionnaire are designed according to the recommendations of Menold and Bogner (2015). Thus, the recommended number of five to seven response categories are adopted for the rating scales. Unipolar rating scales are used, these have a continuum from a low to a high expression and one bipolar Likert scale. The almost exclusive use of rating scales instead of Likert scales, which measure agreement and disagreement, prevents hypothetical bias, as Likert scales typically lead to higher agreement rates (Menold and Bogner, 2015). To ensure robustness, we employ both ascending and descending scale orientations. We also include a scale center for all rating scales.

4.2.2. Target group and preference for delivery attributes

To identify participants belonging to the target group of online shoppers in the fashion, shoes, and accessories sector, we include a screening question at the beginning of the survey. Participants were asked whether they have made an online purchase in the fashion sector within the last 12 months. This screening question ensures the inclusion of respondents with relevant experience and knowledge in the domain of interest.

Next, participants are asked to rate the importance of various delivery attributes, and rate how frequently they utilize various delivery points, such as home address, parcel lockers, or collection points. These questions aim in understanding the general preference for delivery attributes. Fig. 1 shows the first introductory questions of the questionnaire, which identify the target group and record the relevant delivery characteristics of each respondent.

Target audience

1. Have you purchased clothing, shoes, or accessories online in the last 12 months?

- Yes (1)
- No (2) *

*If No is indicated, the survey ends.

Online ordering behavior

2. How often do you order clothing, shoes, or accessories online?

- Several times per week (6)
- Once per week (5)
- Several times per month (4)
- Once per month (3)
- Several times per year (2)
- Once per year (1)

3. How time-sensitive are the majority of your online orders?

I want to wear the clothing, shoes, and accessories...

- the next day (5)
- in the next 2-3 days (4)
- in the next 4-7 days (3)
- next week (2)
- next month (1)

Fig. 1. Introductory questions of the questionnaire.

4.2.3. Socio-demographics and environmental awareness

The questionnaire collects socio-demographic information from the study participants, including gender, year of birth, country, state, employment status, education level, number of persons living in the household, and monthly net household income.

Additionally, the questionnaire assesses the environmental awareness of the participants using a scale developed by the German Federal Environmental Agency (Geiger and Holzhauser, 2020). This scale consists of six affect-cognitive items and three behavioral items, with a satisfactory internal consistency of Cronbach's $\alpha = 0.71$. The environmental awareness of the study participants is then calculated as the average value from the nine items.

4.2.4. Scenarios

(0) *Control condition: No incentive.* The questionnaire includes a baseline scenario with given delivery time, shipping costs, place of delivery, and the CO₂ emissions associated with delivery. This baseline scenario serves as the control condition for the study. In this scenario, the expected delivery time is set at 2–3 days, aligning with the typical delivery promises made by online fashion retailers. The shipping costs are fixed at 4.95€, representing the average cost in the fashion, shoes, and accessories sector (Wollenburg et al., 2018; Conomic, 2021). Participants have the option to choose their preferred delivery location, including home delivery, a parcel locker, or a pick-up station. Various factors in online retail, such as ordering, storage and distribution, last mile delivery, and packaging, contribute to CO₂ emissions ranging from 200 g to 600 g, depending on the process design (Zimmermann et al., 2020). We use an approximate value of 400 g CO₂ emissions and specify this value in the baseline scenario regardless of the delivery method selected.

The baseline scenario is presented first to the participants. Using a 7-level rating scale (7: extremely likely - 1: not at all likely), participants are asked to indicate their likelihood of accepting a delivery time of 4–7 days (see Fig. 2).

In the experimental conditions, participants are presented with the same question regarding the likelihood of waiting 4–7 days for delivery, but with the inclusion of three different incentives. The order in which the incentives are presented varies randomly to eliminate any possible impact of the order of the questions. Furthermore, the three experimental conditions are displayed on separate pages of the questionnaire to avoid spillover effects. The Appendix shows the entire questionnaire used in the study.

(1) *Experimental condition: CO₂ emission savings as incentive.* This incentive aims to reduce the CO₂ emissions of the delivery to 200 g, which represents the minimum emission level according to Zimmermann et al. (2020). To illustrate 200 g of CO₂ emissions, the questionnaire notes that it takes approximately 10 days for a tree to absorb that amount (Bernet, 2023). Participants whose w2w falls below the midpoint of the scale are asked to indicate to what extent they would be willing to wait 4–7 days if the CO₂ emissions from the delivery were fully compensated. This question specifically targets participants who show little response to the reduction of CO₂ emissions. In this case it requires compensation by the retailer or the logistics service provider.

(2) *Experimental condition: Shipping cost savings as incentive.* This incentive involves saving 1€ on shipping costs. Again, participants who indicate a preference to wait below the midpoint of the scale for this incentive are asked an additional question. They are prompted to select from predefined categories to indicate the required amount of cost savings that would make them accept a 4–7 day delivery option. The idea behind this two-stage question was to find out at what minimum level of shipping cost savings the test subject is willing to accept a longer delivery time.

Control condition – no incentive

You are ordering clothing, shoes, or accessories online.
The fashion retailer offers you the following basic delivery option:

Delivery time in 2-3 days
Shipping cost: €4.95
Delivery to the desired location (home, parcel station, shop)
Delivery results in 400 g of CO2 emissions

7. **You can choose the alternative delivery option with a delivery time of 4-7 days. The other delivery attributes remain unchanged. How likely are you to accept a delivery time of 4-7 days?**

- Extremely likely (7)
- Very likely (6)
- Rather likely (5)
- Mixed feelings (4)
- Rather unlikely (3)
- Very unlikely (2)
- Not at all likely (1)

Fig. 2. Control condition (no incentive) of empirical study.

(3) *Experimental condition: Delivery flexibility as incentive.* The third incentive focuses on the flexibility of delivery, allowing participants to choose the delivery day, delivery time window, and parcel service provider.

4.3. Data collection

Pre-test and a priori test power analysis. Prior to the main data collection, we conducted a pre-test to evaluate the suitability of the questionnaire and identify any difficulties or ambiguities. The pre-test involved a group of 20 participants who provided feedback and suggestions for improvements. We made the necessary adjustments based on their input to ensure the clarity and coherence of the questionnaire. Based on the results of the pre-test, the order of the questions and the scales for assessing w2w were adjusted.

For the main study we set a significance level of 5% and a test power of either 80% or 95%. The required sample size then amounts to 216 individuals calculated using G*Power (Faul et al., 2007). The Mixed ANOVA requires a minimum sample size of 18 to 34 individuals per personal characteristic.

Data set. The target population for this study comprises adults who have ordered fashion, shoes and accessories online in the last 12 months. A non-probabilistic sampling method was used in the course of this study, as not every person had the opportunity to take part in the survey, as it was only distributed on social media, selected forums and mailing lists. The survey was administered online using the Qualtrics platform (Qualtrics, 2023). The online format allows us to reach a large and diverse pool of potential participants. We ensure the anonymity and confidentiality of participants' data throughout the data collection and analysis process. The survey was accessible to participants from October 31 to December 18, 2022. During this period, we collected a total of 429 data sets. The final sample size for data analysis is $N = 323$ participants, excluding incomplete or inconsistent responses, which is greater than the a priori determined number of participants needed.

4.4. Data analysis

We decided to apply the analysis of variance (ANOVA) with repeated measurements as the inferential statistical method for the following reasons.

- Objective of the study: Our primary objectives are threefold: (1) to ascertain the existence of any w2w, (2) to evaluate the effectiveness of incentives, and (3) to identify influencing factors.
- Simplicity: The ANOVA and within-subjects design are rather simple compared to choice modeling experiments or other econometric methods. This design helps to keep the size of the questionnaire in reasonable limits.
- Statistical power of within-subjects design with limited sample size: Within-subjects designs typically have higher statistical power compared to between-subjects designs, as each participant serves as their own control.

The use of a discrete choice model as an alternative modeling approach offers the advantage that the marginal rates of substitution can be explicitly recorded and the respective correlations can be recognized. However, the simplicity of our experimental design makes it easily reproducible for companies. Therefore, our results can serve as a basis for future research and possible replication in a company.

We employ ANOVA with repeated measurements to test the research hypotheses, including H1, H2, and sub-hypotheses. Furthermore, we test H3 using Mixed ANOVA, which enables the exploration of potential interactions between the incentives and other variables. Finally, we examine H4 using correlation analysis to determine the relationship between delivery attributes and the w2w. The data analysis is conducted using IBM SPSS Version 28.

5. Findings

In the following, we conduct descriptive analyses in Section 5.1 on the socio-demographics of the sample, including environmental awareness, the order frequency, and the importance of delivery attributes. In Section 5.2, we examine the urgency of orders and analyze the w2w based on personal characteristics, incentives, and the interaction between personal characteristics and incentives.

5.1. Descriptive analysis on socio-demographics and general order behavior

5.1.1. Socio-demographics

The study participants' socio-demographic characteristics are as follows: 54.6% of the participants are female, 44.8% are male, and 0.6% identify as diverse. The participants were born between 1946 and 2005, with an average birth year of 1985. Based on their birth years, the participants were categorized into different generations.

- Baby Boomer (born between 1946 and 1964): 22 individuals (6.8%)
- Generation X (born between 1965 and 1979): 78 individuals (24.2%)
- Generation Y (born between 1980 and 1995): 148 individuals (46%)
- Generation Z (born between 1996 and 2010): 74 individuals (23%)

Table 1
Socio-demographic characteristics.

Variable	M	SD	Min	Max	N
Gender					317
Female					173
Male					142
Diverse					2
Birth year	1984.64	12.35	1946	2005	311
Generations					322
1946–1964 (Baby Boomer)					22
1965–1979 (Generation X)					78
1980–1995 (Generation Y)					148
1996–2010 (Generation Z)					74
Country					323
Germany					311
Austria					6
Switzerland					4
Other					2
Monthly net household income					288
0–520€					3
521–1100€					10
1101–1600€					12
1601–2400€					27
2401–3400€					57
3401–4400€					50
4401–5400€					58
5401–6400€					34
Over 6400€					37
Household size	2.71	1.249	1	6	322
Environmental awareness	3.56	0.660	1	5	323
Employment status					323
School students					2
Student					56
Part-time employment					59
Full-time employment					189
Unemployed, seeking employment					5
Retired					12
Educational level					323
Basic education					20
Secondary education					59
High school diploma					72
Bachelor's degree					72
Master's degree					63
Doctorate					11
Other degree					26
Type of residence					323
Rural (< 5000)					140
Small town (5000–20,000)					63
Medium-sized town (20,000–100,000)					35
Large city (> 100,000)					85

Further socio-demographic characteristics of the sample are summarized in Table 1. We conducted a comparison of the characteristics of our sample with the statistics provided by the Federal Statistical Office of Germany (2024) to ensure its representativeness. In the subsequent analysis, we present the average values of our sample in relation to population statistics, with the first value in parentheses representing our sample and the second value denoting the general population, where applicable. Our findings indicate that, on average, our sample is slightly younger (38 years vs. 44 years), has a slightly higher proportion of female respondents (55% vs. 51%), features a noticeably larger household size (2.71 vs. 2.03), boasts a higher household income, demonstrates a higher level of education, and resides in smaller cities. It is important to note that these variations from the general population seem appropriate, considering the target demographic of an online fashion retailer, which typically comprises of younger women with higher incomes. Additionally, we highlight the relevance of the concept of slowing down logistical processes to achieve temporal consolidation, especially in rural areas. In these regions, geographical consolidation becomes more challenging due to less concentrated demand.

5.1.2. Environmental awareness of the participants

The participants' environmental awareness scale ranges from 1 to 5, with a mean of 3.56 and a standard deviation of 0.66. The quartiles of environmental awareness are used to divide the study participants into categories based on their mean value. For 25% of the study participants, the environmental awareness value is ≤ 3.22 . These subjects are assigned to the low environmental awareness category. The 3rd quartile is 4.00 and therefore study participants with a value > 4.00 belong to the top 25% of the sample. These are assigned to the high environmental awareness category. Study participants whose environmental awareness values lie between the specified values are assigned a medium environmental awareness. The category of medium environmental awareness thus comprises the middle 50% of the sample.

5.1.3. Order frequency

The analysis of order frequency revealed that 191 study participants, almost 60%, order online several times a year. Additionally, 59 people (18.3%) shop online once a month, and 37 people (11.5%) shop online several times a month.

5.1.4. Importance of delivery attributes and usage frequency of delivery locations

Table 2 shows the importance of delivery attributes and the frequency of using delivery locations. The study participants rated the delivery attributes of delivery location ($M = 4.02$) and shipping costs ($M = 4.01$) as equally important, indicating their high importance. Following closely in importance are delivery time ($M = 3.47$) and the ecological impact of a delivery ($M = 2.99$). Subsequently, delivery attributes related to flexibility in delivery hold lower importance. When it comes to the frequency of using delivery locations, home delivery is by far the most frequently used option ($M = 4.50$). The other options (parcel station with 24/7 pickup, click & collect, pickup point with limited business hours) are only rarely used.

Table 2
Importance of delivery attributes and frequency of using delivery locations.

Variable	M	SD	Min	Max
Importance of delivery attributes^a				
Delivery location	4.02	1.128	1	5
Shipping costs	4.01	1.014	1	5
Delivery time	3.47	1.040	1	5
Environmental impact	2.99	1.208	1	5
Delivery day	2.86	1.292	1	5
Choice of courier service	2.54	1.335	1	5
Evening delivery	1.83	1.335	1	5
Afternoon delivery	1.80	1.121	1	5
Morning delivery	1.57	0.925	1	5
Frequency of using delivery locations^b				
Home delivery	4.50	0.927	1	5
Delivery to parcel station	1.63	1.057	1	5
Click & collect	1.46	0.701	1	4
Delivery to pickup point	1.40	0.750	1	4

^a 5-point rating scale: 1 = not important, 2 = less important, 3 = somewhat important, 4 = rather important, 5 = very important.

^b 5-point rating scale: 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always.

5.2. Analysis on customers' willingness to wait

5.2.1. Urgency of the online order

The question of how time-critical the majority of orders are aims to determine the extent to which there is potential for flexibility in delivery times. The results shown in Fig. 3 indicate that a small share of customers (1.9%) want to wear their ordered goods the very next day, while a larger proportion (18.6%) within the next 2–3 days. 30.3% of the study participants want to wear the ordered fashion within the next 4–7 days. These findings suggest that for nearly 50% of the participants, relatively short delivery times are necessary, indicating a limited potential for extending the delivery times of this group due to the perceived urgency of

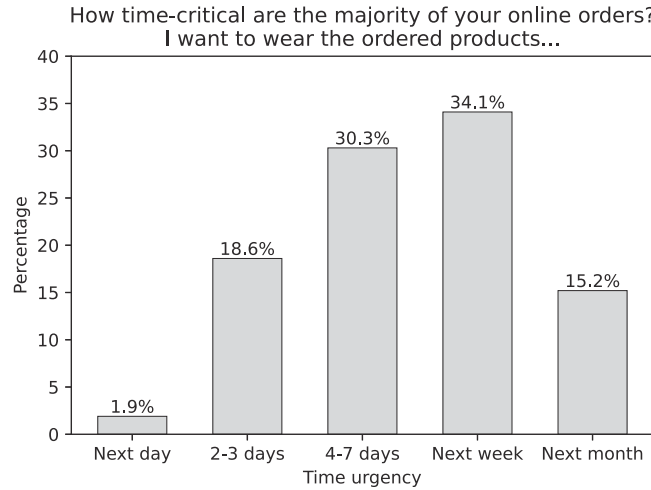


Fig. 3. Urgency of online orders.

online orders. However, it is noteworthy that a significant share of participants (34.1%) would not like to put on the ordered goods until the next week, 15.2% even not until the next month. These two groups represent a potential for extended delivery times. The next paragraph investigates to what extent incentives can contribute to increasing the w2w.

5.2.2. Willingness to wait depending on incentives

Comparison of w2w in control and experimental condition. To evaluate the impact of incentives on w2w, we compare the w2w without any incentive to the w2w with incentives. As mentioned in Section 4.2.4, the w2w is measured using a 7-level rating scale, where participants indicate if they are likely willing to accept a delivery time of 4–7 days given a scenario (7: extremely likely - 1: not at all likely).

We employ ANOVA with repeated measurements to assess the effectiveness of incentives. Despite deviations from normal distribution, which are identified through the Shapiro–Wilk test and Q-Q diagrams, ANOVA with repeated measurements can still be applied since the sample size for each measurement is greater than 10. To address the assumption of sphericity, we conduct the Mauchly test, which yields a highly significant p -value ($p < 0.0001$). Consequently, we apply a correction procedure according to Huynh-Feldt. The results obtained from the ANOVA align with those from the Friedman’s test.

The ANOVA with Huynh-Feldt correction shows that the averages in w2w in the conditions significantly differ from each other, $F(2, 891, 930, 971) = 76.307, p < 0.001, \text{partial } \eta^2 = 0.192$.

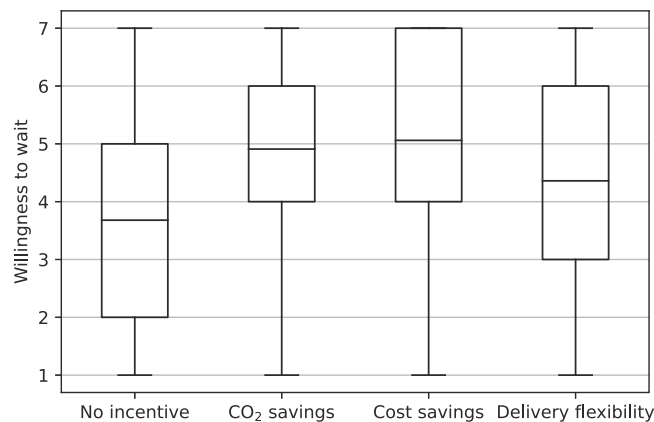


Fig. 4. Boxplots of the w2w depending on incentives.

Fig. 4 presents boxplots illustrating the w2w based on incentives. The control condition, without any incentives, exhibits the lowest average w2w of 3.68 ($SD = 2.013$). When participants are incentivized by saving CO₂ emissions, the average w2w increases to 4.91 ($SD = 1.772$). Similarly, when the incentive involves cost savings, the average w2w is 5.06 ($SD = 1.718$). Finally, the incentive of increasing delivery flexibility leads to an average w2w of 4.36 ($SD = 1.789$), which is the lowest value among the experimental conditions.

Paired post-hoc tests reveal significant differences in w2w between CO₂ emission savings and delivery flexibility, as well as between shipping cost savings and delivery flexibility. However, no significant difference is found when comparing the impact of CO₂ emissions savings and shipping cost savings.

To further understand the impact of the incentives, we calculate effect sizes using Cohen's *d*. The w2w without incentives is 0.611 or 0.686 standard deviations lower than the w2w when CO₂ emissions or shipping costs are saved, respectively. These results indicate a medium to strong effect of both CO₂ emissions savings and shipping cost savings on the w2w. On the other hand, when flexibility in delivery is offered as an incentive, the w2w increases by just 0.338 standard deviations compared to the control condition, representing a small to medium effect size.

For participants who express a w2w below the midpoint for both CO₂ savings and cost savings incentives, we further assess their w2w given additional incentives. Among the 78 participants (24.1%) who expressed a w2w below the midpoint for CO₂ savings, we present them with the option of full compensation for CO₂ emissions as an additional incentive. Among these participants, 47 still indicate a w2w below the midpoint, 18 show partial w2w, and only 13 express a w2w above the midpoint.

Similarly, for the incentive of cost savings of 1€, 62 participants (19.2%) have a w2w below the midpoint. We inquire about the amount of shipping cost savings required for them to be willing to wait for 4–7 days for delivery. Among these 62 participants, 8 individuals are not willing to wait even with additional cost savings, 5 individuals demand cost savings between 2–3€, 7 individuals require savings between 3–4€, and 3 individuals want savings over 4€. The majority, comprising 39 participants, expect free delivery as a trade-off for a delivery time of 4–7 days.

In comparison, for the incentive of delivery flexibility, an even greater number of participants, 114 individuals (35.3%), have a w2w below the midpoint.

Change in w2w when incentives are given. Fig. 5 shows the change in w2w between the control and experimental conditions, i.e., comparing the w2w without incentive to the w2w with incentives.

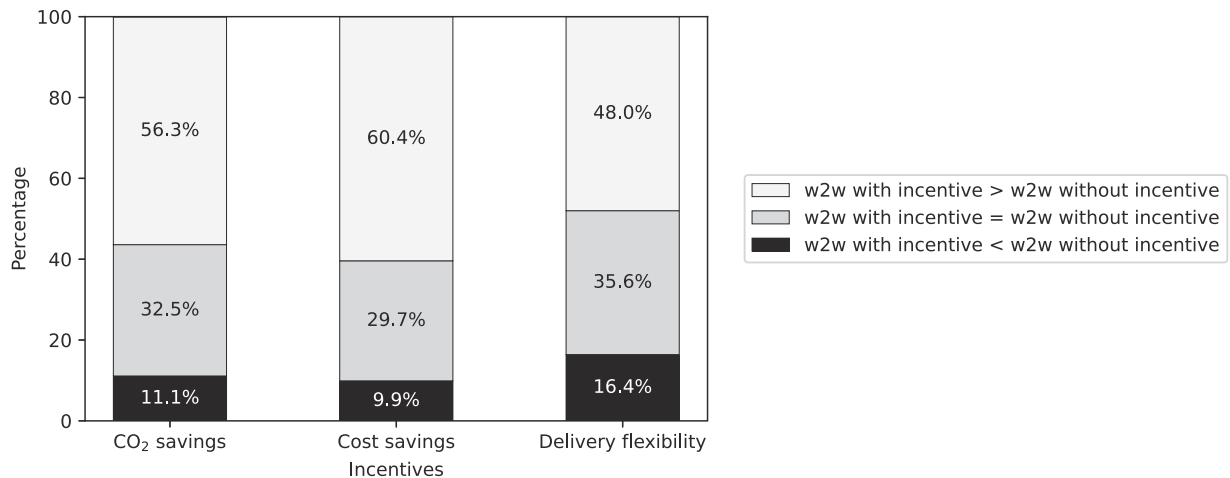


Fig. 5. Change in w2w between control and experimental conditions.

Comparing the control condition with the incentive of CO₂ emission savings, we observe that 56.3% of participants show higher w2w when ecological information is provided.

For the incentive of shipping cost savings, 60.4% of the study participants show an increased w2w. This means that the shipping cost savings incentive leads to the highest proportion of individuals with an increased w2w.

Regarding flexibility as an incentive, only 48.0% of the participants exhibit a higher w2w compared to the control condition. At the same time, the highest proportion of individuals (35.6%) shows no change in their w2w when flexibility is granted, indicating indifference.

Surprisingly, approximately 10% of participants display a lower w2w in the experimental condition than in the control condition when offered shipping cost savings (9.9%) or CO₂ emission savings (11.1%) as incentives. For flexibility as an incentive, this proportion is even higher at 16.4%. For these participants, the presence of an incentive leads to a decrease in their w2w compared to the control condition, contrary to expectations.

Analyzing the subjects who exhibit a lower w2w when ecological information is provided compared to the control condition, we find that these individuals place less importance on the ecological impact of delivery, while delivery time is more crucial to them, indicating time-sensitive orders. Similar observations are made for flexibility as an incentive. The choice of delivery day, delivery time window, and parcel service provider tends to be of lesser importance for these participants, whereas delivery time itself is more critical due to the time-sensitive nature of their orders. Subjects who exhibit a lower w2w when shipping cost savings are granted compared to the control condition emphasize the importance of delivery time and the urgency of the online orders. 53.1% of these respondents consider a shipping cost saving of 1€ to be insufficient. They expect higher cost savings or even free delivery. Consequently, the selected incentives are deemed less attractive for these individuals.

Table 3
Average w2w based on personal characteristics and incentives.

Variable	M	SD	N	Incentive			
				None	CO ₂	Costs	Flexibility
Order urgency							
Wear in 1–3 days	3.52	1.247	66	3.03	3.85	3.83	3.36
Wear in 4–7 days	4.53	1.307	98	3.64	4.97	5.06	4.45
Wear in 7–14 days	4.92	1.250	110	3.93	5.36	5.61	4.78
Wear next month	4.84	1.760	49	4.08	5.22	5.47	4.57
Gender							
Male	4.19	1.444	142	3.35	4.57	4.63	4.21
Female	4.78	1.394	173	3.94	5.24	5.42	4.50
Generations							
Baby Boomer	4.85	1.411	22	4.41	5.55	5.05	4.41
Generation X	4.67	1.424	78	4.06	5.01	4.78	4.82
Generation Y	4.55	1.457	148	3.62	4.99	5.32	4.26
Generation Z	4.16	1.416	74	3.20	4.50	4.86	4.07
Educational level							
Secondary school	4.64	1.514	79	4.15	4.75	5.11	4.53
High school	4.37	1.428	73	3.55	4.92	4.97	4.04
University	4.46	1.440	160	3.46	4.91	5.04	4.43
Employment status							
Less at home	4.48	1.416	56	3.29	5.09	5.29	4.25
More at home	4.51	1.456	267	3.76	4.88	5.01	4.38
Monthly household net income							
0–2400€	4.71	1.438	52	3.75	5.08	5.52	4.48
2401–5400€	4.54	1.527	165	3.79	4.87	5.03	4.47
Over 5400€	4.24	1.359	71	3.37	4.72	4.89	3.97
Residence							
Rural (< 5000)	4.51	1.439	140	3.89	4.79	5.16	4.19
Small town (5000–20,000)	4.56	1.569	63	3.78	4.90	5.11	4.46
Medium-sized town (20,000–100,000)	4.42	1.555	35	3.60	4.77	4.71	4.60
Large city (> 100,000)	4.48	1.341	85	3.29	5.19	4.99	4.46
Environmental awareness							
Low	3.65	1.401	71	3.10	3.51	4.41	3.59
Medium	4.55	1.357	159	3.75	4.96	5.08	4.40
High	5.08	1.333	93	4.00	5.91	5.53	4.87

w2w measured on a 7-point rating scale: 1 = not at all likely, ..., 7 = extremely likely.

5.2.3. Willingness to wait depending on personal characteristics and incentives

The average w2w is analyzed depending on various personal characteristics, including urgency of the order, gender, generation, educational level, employment status, income, place of residence, and environmental awareness. Table 3 shows the w2w depending on these personal characteristics and given incentives. Column *M* shows the average w2w across all conditions, *SD* the standard deviation and *N* the respective sample size. The following columns present the respective average w2w depending on the condition (i.e., no incentive, CO₂ emission savings, shipping costs, and delivery flexibility as incentive).

A mixed ANOVA is conducted to assess the statistical significance of the findings. Again, Q-Q diagrams and the Shapiro–Wilk test reveal significant deviations from the assumption of normally distributed data. However, the mixed ANOVA remains appropriate as the sample size exceeds 10 per category. The Levene test confirms homogeneity of variance in w2w across all groups. Additionally, no violation of sphericity is observed based on the Huynh-Feldt test. Post-hoc tests using Hochberg’s GT2 method are conducted to determine significant differences in mean w2w. These tests account for the varying sample sizes across factor levels while considering the equality of variances indicated by Levene’s test. Mean values are used to determine the direction of the effect.

Order urgency. The urgency of online orders yields a significant main effect ($F(3, 255) = 11.258, p < 0.001$). The w2w increases as the urgency decreases. Participants wishing to wear the ordered clothing within 1–3 days have the lowest w2w, while those aiming for next month have the highest w2w. The w2w is significantly lower for orders requiring delivery within 1–3 days compared to orders with delivery times of 4–7 days, 7–14 days, or the following month ($p < 0.001$). The effect size is high, with a partial $\eta^2 = 0.117$. We observe that the w2w increases when the urgency of the order decreases across all conditions. Participants in the categories of wearing the clothing in 7–14 days or the next month show higher w2w in all conditions compared to those in the categories of wearing it in 1–3 or 4–7 days.

Gender. Gender exhibits another significant main effect ($F(1, 255) = 5.625, p < 0.018$). Women display a significantly higher w2w compared to men. However, the influence of gender on w2w is relatively low, with a partial $\eta^2 = 0.022$. Women consistently exhibit a higher w2w across all conditions compared to men.

Generations. Analyzing the four generations, it becomes apparent that the w2w tends to rise with age. The Baby Boomers, the oldest generation, display the highest w2w, whereas Generation Z, the youngest generation, demonstrates the lowest. However, the specific generation does not yield a main effect, suggesting that there are only slight variations in the w2w, $F(3, 255) = 1.318, p = 0.269$. In general, w2w increases with age when no incentive is offered. The w2w of the Baby Boomer generation increases the most when CO₂ emissions are presented as an incentive but does not change for the flexibility incentive. Generation X also reacts the most to the CO₂ emissions incentive; but, in contrast, also reacts when flexibility is offered as an incentive. Generation Y displays the highest w2w when shipping costs are presented as an incentive. Similarly, Generation Z, the youngest generation, reacts particularly to the cost savings incentive.

Educational level. The educational level ($F(2, 255) = 0.419, p = 0.658$) of the participants shows no significant variations in the w2w among the different groups. The w2w is also closely aligned across all conditions, except for participants with a secondary school degree, who display a mean difference of more than 0.5 compared to those with a high school or university degree in the control condition.

Employment status. The employment status is not included in the ANOVA, because of preliminary analysis that has shown no significant differences. The means of the w2w exhibit only slight differences, all less than 0.5 across all four conditions.

Monthly household net income. There seems to be a slight relation between income and w2w, as the w2w decreases with increasing participant income. We observe a similar decrease in the w2w with increasing income across all four conditions. However, again no significant differences can be found among the three income groups, $F(2, 255) = 1.338, p = 0.264$.

Residence. There are also no significant differences in the w2w regarding the place of residence ($F(3, 255) = 0.020, p = 0.996$). Participants living in rural areas show the highest w2w in the control condition, with a mean of 3.89, while urban dwellers exhibit the lowest mean of 3.29. No mean differences larger than 0.5 are observed in the other experimental conditions.

Environmental awareness. Regarding main effects, environmental awareness demonstrates a significant influence on w2w ($F(2, 255) = 12.193, p < 0.001$). Increasing environmental awareness corresponds to a higher w2w. Notably, individuals with medium or high environmental awareness exhibit significantly higher w2w compared to those with low environmental awareness ($p < 0.001$). Additionally, the difference between medium and high environmental awareness is significant ($p = 0.032$), indicating that individuals with high environmental awareness have a significantly higher w2w compared to those with medium environmental awareness. The effect of environmental awareness on w2w is classified as medium to high, with a partial $\eta^2 = 0.087$. In the absence of incentives, individuals with low environmental awareness display the lowest w2w. Also, medium or high environmental awareness has minimal influence on the w2w when no incentive is given. Conversely, individuals with high environmental awareness have a higher w2w when CO₂ emissions are presented as an incentive.

5.2.4. Relationship between delivery attributes and incentives

Table 4 shows the correlation between a delivery attribute (row) and an incentive (column). A total of 36 comparisons were made in the correlation analysis, examining the relationship between nine delivery attributes and w2w in four different conditions. To account for the multiple comparisons, the more liberal Bonferroni–Holm correction was applied. Despite the 36 comparisons, only the significant findings of the bivariate correlation analysis are presented. For those, the Spearman correlation coefficient r , the 95% confidence interval of the correlation coefficients, and the significance level adjusted according to Bonferroni–Holm, are given. In the conditions, there is a significant ($p < 0.001$) and negative correlation between the delivery time attribute and w2w. This negative correlation indicates that as the importance of delivery time increases, the w2w decreases. The strength of the correlation between delivery time and w2w is categorized as weak to medium, suggesting a slight to moderate decrease in w2w with greater importance placed on delivery time. The correlation between the ecological impact of delivery and w2w is significant in all conditions with a significance level of $p < 0.001$. The correlation direction is positive, indicating that as the importance of the ecological impact of delivery increases for the participants, their w2w also increases. The strength of the correlation between ecological impact and w2w varies from weak to medium, depending on the absence of incentives, the presence of shipping costs, or flexibility as incentives. In contrast, there is a strong correlation between ecological impact as a delivery attribute and w2w when CO₂ emissions are used as an incentive.

Table 4
Correlation matrix of delivery attributes and w2w in the conditions.

Delivery attribute	Incentive			
	None	CO ₂	Costs	Flexibility
Delivery time	-0.232*** [-0.346; -0.119]	-0.338*** [-0.427; -0.231]	-0.336*** [-0.433; -0.236]	-0.316*** [-0.413; -0.216]
Ecological impact	0.247*** [0.142; 0.357]	0.533*** [0.445; 0.618]	0.218*** [0.105; 0.331]	0.280*** [0.181; 0.391]
Delivery day			-0.199*** [-0.313; -0.094]	
Afternoon delivery		-0.175** [-0.284; -0.067]		

** $p < 0.01$.
*** $p < 0.001$.

5.2.5. Summary and hypotheses

In conclusion, the presence of economic or environmental incentives influences the w2w, accepting hypothesis H1. Furthermore, all given incentives (CO₂ emission savings, cost savings, flexibility) increase the w2w, leading to the acceptance of sub-hypotheses H1a, H1b, and H1c. There is a significant difference in the effectiveness of incentives, therefore accepting H2. Specifically, the flexibility incentive is less effective than saving 1€ or saving CO₂ emissions. Note, however, that the effectiveness of shipping cost savings is not significantly different from the effectiveness of CO₂ emission savings. However, there are individuals for whom incentives do not lead to an increased w2w, indicating that their preferences and priorities differ. Based on the results of the mixed ANOVA, H3 is partially accepted, as gender, generation, environmental awareness, and urgency of online orders influence the acceptance of a longer delivery time. In contrast, income, education level, and type of residence show no significant effect on the w2w. This finding emphasizes the importance of understanding individual customer preferences and tailoring incentives accordingly. The importance of only a few delivery attributes significantly influences the w2w in all four conditions. Specifically, the importance of delivery time and ecological impact has a significant influence on the effectiveness of all four incentives on the w2w. Delivery day and afternoon delivery show a significant influence on only one incentive. The majority of delivery attributes examined has no significant influence on the effectiveness. Specifically delivery location, morning/evening delivery, or choice of parcel service provider have no significant influence on the w2w. Therefore, H4 is only partially accepted.

6. Discussion

6.1. Discussion of results in relation to literature

The empirical study shows that the most important delivery attributes are the delivery location, with customers preferring home delivery, followed by shipping costs and delivery time (see Section 5.1.4). The environmental impact of delivery is also considered relevant. However, delivery attributes that offer flexibility in delivery play a subordinate role according to the study participants.

In German-speaking countries, the delivery location is considered one of the most important delivery attributes alongside shipping costs, whereas in Belgium, it ranks behind shipping costs, returns policy, and delivery time (Buldeo Rai et al., 2019). Similar findings were observed in a study with Dutch customers, where shipping costs and delivery time were prioritized over flexibility in delivery (Nguyen et al., 2019). The choice of delivery day and time window, which allows for delivery flexibility, was also given little importance in the Netherlands (Nguyen et al., 2019). Limited research has been conducted on the ecological impact of delivery as a delivery attribute and customer preference. Nevertheless, the results of the present study are consistent with a study conducted with Brazilian customers (Nogueira et al., 2021), as ecological impact ranks behind shipping costs and delivery time.

Overall, the findings of the present study align with other research, indicating that shipping costs are widely regarded as the most important delivery attribute across different countries, followed by delivery time. The results regarding the ecological impact and flexibility as delivery attributes are also consistent with findings from other studies. However, there is a contrasting tendency regarding the importance of delivery location as a delivery attribute, which could be attributed to cultural differences or differences in logistics infrastructure, although further research is needed to explore this.

In terms of mean w2w, it is lowest without an incentive. It significantly increases with a saving on shipping costs or CO₂ emissions (see Section 5.2.2). The mean w2w with flexibility in delivery is significantly higher than in the control condition but lower than in the other two experimental conditions. The lower importance of flexibility as an incentive aligns with the relevance of corresponding delivery attributes, where the choice of delivery day, time window, or service provider holds secondary importance for the subjects. The result of a significantly higher w2w in the case of a shipping cost saving is consistent with the high relevance of shipping costs as a delivery attribute. A shipping cost saving of 1€ proves to be an effective lever for influencing the delivery time. Similarly, the study participants respond well to CO₂ emissions as an incentive, despite attaching less importance to environmental impact as a delivery attribute than to shipping costs. This may be due to customers' limited awareness of the ecological impact of delivery (Sallnäs and Björklund, 2020) or insufficient information provided by retailers and logistics service providers (Ignat and Chankov, 2020). By specifying the CO₂ emissions in the experimental condition, customers become consciously aware of the environmental impact of delivery, leading them to choose a more environmentally friendly delivery option. Another possible reason for the similar values of w2w for both shipping cost savings and CO₂ emissions incentives is social desirability, where subjects rate the incentive of CO₂ emissions higher due to its social desirability. Perceived social norms have also been shown to influence consumers' environmental behavior in other studies, such as carbon offsets for airline tickets and rural mobility behavior (Truong-Dinh et al., 2023; Luo et al., 2022). This similarity in effectiveness of economic and environmental incentives is also observed in other studies (e.g., Fu and Saito, 2018).

Analyzing the impact of incentives on the change of w2w reveals that besides an increase in w2w, there is also indifference or even a decrease in w2w in the experimental conditions compared to the control condition. The decrease in w2w in the presence of incentives, particularly with flexibility as an incentive, may appear counterintuitive. However, this phenomenon has also been observed in other studies (Ignat and Chankov, 2020). It suggests that individuals choose a sustainable and/or socially responsible delivery option before being informed about the environmental and/or social impacts of the delivery. Upon closer analysis, it is evident that subjects who exhibit higher w2w in the control condition attach little importance to corresponding delivery attributes such as ecological impact, shipping costs, and flexibility, while emphasizing delivery time and order urgency. This implies that the respective incentive is not relevant to the study participants. Since the w2w in the experimental condition is even lower than in the control condition, the study participants may express an aversion to the respective incentive or emphasize that the incentive is not relevant to them.

Regarding specific findings related to incentives, 24.1% of the study participants exhibit little response to a CO₂ emissions saving. Offering these individuals full compensation for CO₂ emissions does not prove effective, as it has no significant impact on the w2w. Moreover, full compensation of CO₂ emissions by the retailer or logistics service provider would incur additional costs, whereas the emissions saving results from an extended delivery time, which typically does not involve additional costs for the actors. Consequently, it can be concluded that CO₂ compensation is not useful as an incentive due to the associated costs and the lack of clear positive impact on w2w.

Among the study participants, 19.2% exhibit a limited response to a shipping cost saving of 1€, with their willingness to accept a longer delivery time falling below the midpoint of the scale. Within this group, 24.2% expect additional savings of more than one Euro, and 62.9% expect free delivery. For these customers, extending the delivery time implies additional costs as the logistics expenses are partially or not covered by the shipping costs.

Individuals with a high level of environmental awareness demonstrate a higher w2w compared to those with medium or low environmental awareness (see Section 5.2.3). Moreover, individuals with high environmental awareness respond particularly strongly to CO₂ emission savings as an incentive. Women exhibit a greater willingness to accept a longer delivery time compared to men. Additionally, women respond more strongly to incentives related to CO₂ emissions and cost savings compared to men. This tendency of women to choose an environmentally friendly delivery option at the cost of longer delivery time is also observed in [Nogueira et al. \(2021\)](#). However, these findings contradict the results of a study conducted with Indonesian subjects, where no significant difference was found between men and women in terms of green behavior ([Deliana and Rum, 2019](#)). Older individuals belonging to the Baby Boomer or Generation X generations tend to show a higher w2w without incentives compared to younger individuals. Baby Boomers are particularly responsive to CO₂ emissions savings, whereas Generations X, Y, and Z respond more to cost savings incentives. These results only partially align with the findings of [Fu and Saito \(2018\)](#). [Fu and Saito \(2018\)](#) found that older individuals react on economic incentives less than younger individuals and are also less responsive to environmental incentives. In contrast, the present study indicates that the Baby Boomer generation responds particularly strongly to ecological incentives. Generation Z also responds but exhibits the lowest w2w among the four generations for this specific incentive. Thus, the findings of the present study contradict [Deliana and Rum \(2019\)](#) that found different generations exhibiting distinct green behaviors, with younger generations being more environmentally conscious. Moreover, the present study challenges the results of [Nogueira et al. \(2021\)](#) that concluded people under 24 years of age and over 49 years of age are more likely to choose a longer delivery time.

Furthermore, individuals whose online orders are less time-critical display a higher acceptance of longer delivery times. This pattern holds true for both w2w with or without incentives. It indicates that online orders vary in terms of urgency, with delivery being less time-critical for 50% of the study participants. These findings show that fast deliveries are not necessary for all customers, highlighting the potential for a slower delivery option that retailers and logistics service providers have so far hardly taken into account.

An analysis of the correlation between the importance of each delivery attribute and w2w in the conditions (see Section 5.2.4) reveals a negative correlation between the importance of delivery time and w2w, whereas the importance of ecological impact shows a positive correlation with w2w. Individuals who prioritize delivery time demonstrate lower w2w across all conditions. The correlation between importance of ecological impact and w2w is particularly interesting, as it suggests that individuals who care about the environmental impact of delivery exhibit a higher w2w. This indicates that customers associate longer delivery times with more environmentally friendly delivery options.

6.2. Recommendation for online retailers

The advantages of a slower delivery option for online retailers include lower logistics costs and a positive environmental impact. Customers in the fashion, shoes, and accessories sectors have varying levels of w2w for their online orders. Therefore, it is advantageous for online retailers to offer customers a slower delivery option during the checkout process. By expanding the range of delivery options, it is also unlikely that customers will abandon their purchase due to long delivery times, as they still have choices available to them, allowing them to select a suitable delivery option based on their needs.

Furthermore, online retailers can increase the acceptance of longer delivery times by making customers aware of the ecological impact of delivery. Informing customers about the CO₂ emissions generated during delivery is a good starting point. By stating the CO₂ emissions that can be saved through longer delivery times and illustrating how long it takes a tree to absorb the CO₂ emissions produced, w2w can be increased. The advantage of this incentive is that it does not affect the online retailer's cost structure. Another way to encourage the selection of a slower delivery option is to offer cost savings on shipping. Even a 1€ reduction in shipping costs can increase the acceptance of longer delivery times. However, it is important to consider that reducing shipping costs affects the online retailer's cost structure since shipping costs cover parts or all of the logistics expenses. Therefore, online retailers considering this incentive should conduct a cost-benefit analysis in advance to determine the impact on logistics costs. The impact will depend on the design of the logistics system specific to each online retailer, so reducing shipping costs as an incentive for longer delivery times is not recommended universally.

These explanations demonstrate that online retailers should consider their target audience and market positioning when choosing incentives. For example, for online retailers selling sustainable fashion, using the reduction of CO₂ as an incentive for higher w2w is a suitable choice, as it can be assumed that their customers have a high level of environmental awareness. Additionally, offering a slow delivery option can contribute to the image of the online retailer as a sustainable company. On the other hand, for fashion companies in the fast-fashion sector targeting young people, offering shipping savings as an incentive may be more appropriate. It is important to note that implementing a slow delivery option requires cooperation with a logistics service provider if the online retailer does not have its own vehicle fleet.

7. Conclusion

Summary. This paper focuses on the impact of economic and environmental incentives on customers' willingness to accept longer delivery times in the fashion, shoes, and accessories sector of online retail in German-speaking countries. With shorter delivery times becoming increasingly prevalent in online retail, this study investigates whether customers are open to longer order fulfillment times when provided with incentives. The research methodology involves an online survey using a within-subjects design.

The study reveals that incentives have a significant influence on customers' willingness to wait (w2w) longer for their online orders. Notably, cost savings on shipping and reductions in CO₂ emissions are found to have the most substantial effect. Additionally, the research highlights that customers' responses to the incentives vary based on individual characteristics, such as gender, age, environmental awareness, and the urgency of their orders. These findings indicate that customers are willing to make trade-offs in delivery time and emphasize the importance of addressing the environmental impact of online retail delivery. Practical recommendations for online retailers and logistics service providers include expanding the range of delivery options to include a slower alternative and tailoring incentives based on the target audience and market positioning of the company. By considering these insights, online retailers can strike a balance between customer expectations, cost efficiency, and environmental sustainability in their delivery strategies.

Limitations. The empirical study targets the fashion, shoes, and accessories segment. Therefore, the extent to which the results can be applied to other market segments and products is uncertain. This is because the selected incentives are based on different delivery attributes, and the importance of these attributes for customers may vary depending on the product type and other factors. As a result, the effectiveness of the incentives may differ when applied to other product categories, such as electronic goods.

In order to keep the complexity of the study in check certain aspects are not examined. For instance, different price levels of the products are not taken into account, and the number of levels for the selected delivery attributes is limited. In terms of delivery time, only standard delivery times of 2–3 days and extended delivery times of 4–7 days are considered. Other levels of delivery time are not included in the analysis. Similarly, shipping costs are examined with a fixed rate of €4.95, without considering options such as free delivery or threshold-based shipping costs. The study focuses on delivery to a desired address, which includes home delivery as well as delivery to a pick-up or packing station.

The study also involves a pre-selection of incentives. As a result, certain incentives investigated in [Buldeo Rai et al. \(2021\)](#), such as green delivery cues, the order of delivery options, social media sharing options, or social norms, are not part of our study.

A further limitation of surveys is the potential discrepancy between respondents' stated intentions and their actual behavior in real-life situations. Moreover, respondents may adjust their responses to align with socially desirable behaviors, leading to biased results ([Beck and Ajzen, 1991](#)). Even though literature shows that if there is a large social distance between the respondent and the researcher for example in a self-administered web survey, the tendency to present oneself more positively is lower (e.g., [Tourangeau and Yan, 2007](#)).

Further need for research. To address these limitations and validate the positive findings of the study regarding the effectiveness of incentives, conducting an experiment or implementing a test phase within an online store of a fashion retailer would be beneficial. This approach would serve to verify the behavioral intentions expressed in the survey and evaluate actual customer behavior in a real-world setting. [Hämmerli \(2022\)](#) describes a realized case from the consumer electronics industry. The results presented are consistent with our findings, e.g., females and elder customers have a longer w2w than males and young customers. Apart from experiments or test phases within the fashion industry, further research could focus on more urgent products (e.g., groceries) and evaluate the w2w in those contexts.

The outcomes of comprehensive climate policy assessments in Europe show that further innovative and creative ideas are needed, especially in the transportation sector, to achieve the climate targets agreed in Europe ([Khurshid et al., 2023](#)). The issue of customers' w2w within the "slow logistics" concept investigated in this paper represents a small but possible contribution to this. However, there are several areas that require further research. Firstly, considering different price levels of products, further differentiation of delivery times, and exploring different shipping cost levels or the option of free delivery would be valuable. A potential starting point for future research is to combine the incentives of shipping cost savings, CO₂ emissions reduction, and flexibility with the non-financial incentives proposed by [Buldeo Rai et al. \(2021\)](#) to compare their effectiveness. Additionally, there is a need for broader research examining the influence of these incentives on customer satisfaction and loyalty.

CRedit authorship contribution statement

Melanie Dietl: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Stefan Voigt:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Conceptualization. **Heinrich Kuhn:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Conceptualization.

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Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.trd.2024.104280>.

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