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Measuring consumer perceptions of home-delivery convenience—the case of cargo bikes

Abstract

Purpose. Despite the increasing use of home delivery (HD) in e-commerce, no studies have explicitly examined consumer perceptions of the convenience of the last-mile delivery of goods by cargo bike (CB). Therefore, our study aims to identify the dimensions of HD convenience and to develop a reliable and valid measurement tool, namely the Home-Delivery Convenience via Cargo Bike (HDCCB) scale.

Design/methodology/approach. The methodology of this scale development study is premised on a review of the existing literature, which identifies differences in consumer perceptions of the convenience of services. We conducted semi-structured interviews with 10 online consumers and validated the content with three experts on marketing in the retail and services sectors in order to develop the items for the scale. Thereafter, we identified the main dimensions through an exploratory factor analysis that we applied to an online survey with 116 respondents. Finally, the scale was validated through a confirmatory factor analysis of an online survey with 300 respondents.

Findings. Following the original work of Brown (1990), we define consumer perceptions of HD convenience as a multidimensional construct and measure each facet of its four dimensions, which are time, use, execution, and acquisition. E-retailers and last-mile logistics providers could use our proposed measurement tool to assess consumer perceptions of the convenience of HD. That assessment could generate a competitive advantage.

Originality. Our study is original because it deepens the existing understanding of consumer perceptions of the convenience of HD by CB in last-mile logistics. It also develops a multidimensional measure that is based on an empirical study.

Keywords: e-commerce; last-mile logistics; home delivery; cargo bike; service convenience; consumer perceptions; home-delivery convenience; HDCCB.

1. Introduction

The growth of e-commerce and the intensifying demand for speed drive the need for innovation in the design, management, and operation of urban logistics systems. The resultant innovations should also be sustainable and cost effective (Faugère et al., 2022; Risberg & Jafari, 2022). As

the increasing flow of e-commerce orders continues to generate new records for annual sales, the dominant players in the last-mile market face the challenges of increasing customer demand. In response, e-retailers and logistics service providers seek innovative solutions, which are often based on technological advances (Teller et al., 2019; Vakulenko et al., 2019). By 2050, 86.6% of the population of the more developed regions of the world will be living in urban areas (UN DESA, 2018). In 2022, the degree of urbanization worldwide was at 57% (Population Reference Bureau, 2022). Increasing population density is a challenge for urban logistics because it results in traffic congestion and necessitates the use of irregular locations for logistics facilities. These problems become even more complex in megacities due to their high population density (Fransoo et al., 2017). Online retail, which requires goods to be transported to consumers' homes, increases the incidence of freight movement within cities. At the same time, the size of individual shipments decreases (Savelsbergh & Van Woensel, 2016), making the planning of last-mile logistics more difficult. In addition, online shippers must continue to meet consumers' expectations about speed (Manerba et al., 2018). In recent decades, last-mile delivery has attracted growing attention because of the e-commerce boom (Ouyang et al., 2023). However, to date, research on delivery by cargo bike (CB) remains extremely scarce. The uniqueness and the practical relevance of the present study therefore lie in its potential to reveal solutions to the problems of concentration and traffic. These solutions can enable the delivery of e-commerce products to remain convenient.

Last-mile logistics is a complex system that involves strategic planning. Such planning is necessary in order to implement and manage the efficient transportation and storage of goods from the receipt of an order to the end customer (Melkonyan et al., 2020; Olsson et al., 2019). Last-mile distribution activities focus on channel design, inventories, delivery, and execution at the tactical and the operational level. The last mile is defined as the final segment of the delivery process. That segment is related to a set of activities that are necessary for successful delivery from the last transit point to the last transfer point in the supply chain (Lagin et al., 2022; Yuen et al., 2018). Last-mile deliveries are an increasingly important and costly component of supply chains, especially in urban centers (van Lopik et al., 2020). The last meters of many deliveries are covered on foot. Although new technologies that can support improved navigation are being explored, the focus, to date, has been on technical implementation (van Lopik et al., 2020).

As far as the sustainable development of cities is concerned, CBs can provide an attractive solution to some of the challenges of last-mile logistics. CBs, as a technology, lie at the intersection of micromobility and electric mobility. They are two-to-four-wheel vehicles

that can carry cargo. An electric motor often assists the driver when they pedal (Dalla Chiara et al., 2023). Many alternatives to CBs can be used in last-mile logistics, including drones (Rejeb et al., 2021) and electric autonomous vehicles (Monios & Bergqvist, 2020). CBs are more likely to be used for the last mile of a delivery in urban centers with narrow roads (Fontaine, 2022; Muñoz-Villamizar et al., 2019). The CB seems to be a viable solution for urban logistics and the transportation of light goods in inner cities. In environmental terms, CBs reduce road traffic and thus emissions of CO₂. They emit no greenhouse gases and make little noise. Thus, using CBs actively reduces air and noise pollution (Buldeo Rai et al., 2019; Muñoz-Villamizar et al., 2019). This perception may lead some consumers to prefer CBs over other delivery models. Many authors have confirmed the potential of CBs in urban environments (Melo & Baptista, 2017; Mühlbauer & Fontaine, 2021; Sheth et al., 2019). Indeed, the companies that are involved in urban logistics are increasingly using CBs or evaluating them in pilot projects (Leonardi et al., 2012).

Convenience is important for goods, services, ideas, and anything else that may add to one's comfort. It is a multidimensional construct that not only reveals strategic and tactical marketing opportunities (Brown, 1989) but can also have numerous implications for delivery companies in the context of last-mile logistics (Colwell et al., 2008; Reimers, 2014; Reimers & Clulow, 2009). Convenience can be viewed as a variable that aggregates the four utilities of economic theory—a service is convenient if it is available in the right place and at the right time as well as if its acquisition, ownership, and use require little effort (Brown, 1990). Despite the remarkable growth of e-commerce and the use of CBs in last-mile logistics, no study has explicitly examined the convenience of last-mile home delivery (HD) with CBs (Ma et al., 2022; Reimers & Clulow, 2014; Salhieh et al., 2021). Therefore, our study is intended to 1) identify the dimensions of HD convenience (time, use, execution, and acquisition) and 2) to develop a reliable and valid measure of last-mile HD convenience in the context of CBs. Accordingly, we present the Home-Delivery Convenience via Cargo Bike (HDCCB) scale. We introduce the four main dimensions on which convenience depends, namely use, time, execution, and acquisition, and we propose a weighting for them.

The paper is organized as follows: Section 2 describes the theoretical foundations of the study and explains the importance of considering the convenience of HD as a multidimensional construct in last-mile logistics with CB. Section 3 presents the methodology of the empirical study, and Section 4 presents the results. The conclusions, limitations, and avenues for future research are described in Section 5.

2. Literature review

In this section, we review the relevant literature to understand the potential of CBs in last-mile logistics and to identify the differences between the consumer perceptions of convenience services that have emerged from studies on marketing and e-retail.

2.1 Home delivery and the cargo bike in last-mile deliveries

The last mile is critical to the delivery of goods and services to consumers, accounting for 13% and 75% of total supply-chain costs (M. Wang et al., 2022). The technology and convenience of e-commerce are increasingly exerting pressure on the last-mile distribution system and creating a need for new logistics solutions. The discrete temporal and spatial distribution of customer demand leads to higher rates of error in deliveries and to lower vehicle utilization; consequently, last-mile deliveries have become time consuming and uncertain. CBs are a promising solution that is already used widely in some cities. A CB is a type of commercial electric vehicle. Critically, CBs are quicker than cars over short distances (Fontaine, 2022; Raeesi & Zografos, 2022).

CBs can avoid traffic congestion, they can take shortcuts through parks, and they can be parked on sidewalks, minimizing walking distances (Jie et al., 2019; Rudolph & Gruber, 2017). Recent developments in bicycle technology have contributed to the use of bicycles for urban freight transportation. These developments include the use of lighter materials; the design of bicycles with larger cargo capacities, in terms of both weight and volume; the development of trailers; and the introduction of electric motors that assist the rider, especially on inclines (Browne et al., 2011; Mashalah et al., 2022). As a result, this type of transportation is finally being adopted in large metropolitan areas (Goeke & Schneider, 2015; Muñoz-Villamizar et al., 2019).

One of the strongest ideas that pertain to the sustainable supply chain is the use of environmentally friendly vehicles for last-mile delivery (Fontaine et al., 2021). Since a CB does not produce CO₂, CBs are considered to offer a suitable alternative to traditional delivery methods (Buldeo Rai et al., 2019). Unlike conventional bicycles, CBs have trunks. These trunks can be as large as 2 m³, and they can hold up to 250 kg of goods. In addition, CBs are equipped with electric motors. Their use seems to be particularly important because modern consumers are concerned about the environment, which makes them more favorably disposed to the service. Consequently, its provision presents delivery companies with both financial and reputational opportunities (Louis et al., 2019).

Research on electric vehicles in the supply chain often lacks a theoretical background. Many studies rely heavily on game theory (Gu et al., 2019; Wu et al., 2021; C. Zhang et al., 2022), with a minority of contributions drawing on resource dependence theory (Kalaitzi et al., 2019), credibility theory (S. Zhang et al., 2020), graph theory (Miao et al., 2014), stakeholder theory (Bhuyan et al., 2022), innovation diffusion theory (Ruoso & Ribeiro, 2022), grounded theory (Anosike et al., 2021), practice theory (Sopjani et al., 2020), and transition theory (Sushandoyo & Magnusson, 2014). In order to integrate consumers into the supply chain more seamlessly (Ageron & Marty, 2022), we adopt a novel theoretical approach—our objective is to identify dimensions of the convenience of services (Brown, 1989, 1990) and to create a measure of these dimensions for last-mile logistics with CBs.

2.2 Theoretical foundation: service convenience as a multidimensional construct

Copeland (1923) suggested that the time and the physical and mental effort that the purchase of a product require from the consumer should be minimized. Brown (1990) defined service convenience as any facilitation that causes the consumer to experience excitement about a particular service or product. For example, the service or product may be sold in a way that conserves the time and the effort that the consumer must expend. In order to provide a high-quality service that meets consumer expectations, the company must offer a convenient service (Berry et al., 2002; Liang & Wang, 2006). Convenience enables companies to strengthen their relationships with consumers and to amass competitive advantages (Seiders et al., 2007). When other companies also offer convenient services, the company must differentiate itself by offering better value if it is to maintain its market position (Colwell et al., 2008). Many scholars have found that consumer purchasing behavior is strongly influenced by service convenience (Dai & Salam, 2014).

In this paper, we distinguish between two types of convenience in the marketing literature: service convenience (Berry et al., 2002; Brown, 1990; Gehrt & Yale, 1993) and retail convenience (Beauchamp & Ponder, 2010; Colwell et al., 2008; Reimers & Clulow, 2009; Seiders et al., 2007). In the context of services, convenience is often associated with time or place, use, execution, and acquisition. Retail convenience is often described by reference to the dimensions of access, search, possession, transaction, utility, and post-use. In light of the absence of a scale that measures perceived convenience across the delivery process comprehensively, the purpose of the present study is to identify the dimensions of HD convenience. Accordingly, we develop the HDCCB scale as a parsimonious measurement tool.

Insert Table 1 about here

2.3 Dimensions of home-delivery convenience

Gevaers et al. (2009) described several problems with HDs, one of which is the high proportion of failed deliveries. The quality of delivery is assessed primarily by reference to the availability of flexible delivery-time windows, reliability, ease of use, and trust in the delivery agent (Ghajargar et al., 2016). Following Brown's (1990) conceptualization of service convenience, we define HD convenience as the consumer's perceptions of product delivery in terms of time, use, execution, and acquisition.

Time

We define the "time" dimension in relation to the expectation that products will be delivered within a reasonable timeframe, given a scheduled delivery window. Retailers have recognized that consumers see time as a valuable resource (Beauchamp & Ponder, 2010). A HD can be completed at a time that is convenient for the consumer. For example, courier shipments may be subject to specific constraints because companies allow customers to specify precise time windows (Gruber et al., 2014).

Use

When we write of "use," we mean to refer to the tracking of products during shipment and control over CO₂ emissions as well as to the specificities of the delivery of sensitive products. Planning and operations are critical to the quality of delivery services. E-retailers can offer additional services to facilitate the delivery of goods, such as more convenient delivery options.

Execution

In the context of the execution dimension, it is important to note that consumers expect to receive products in satisfactory condition and to be able to return them without undue difficulty (Berry et al., 2002; Brown, 1990). Consumers may be willing to outsource some (or all) of the work that is required to purchase certain products. The introduction of a service component (execution) into a product offering may make delivery more convenient. For example, some of the steps that must ordinarily be taken to select or return products may be eliminated.

Acquisition

In our framework, the term “acquisition” has to do with ensuring that a purchase can be completed without errors and through the use of a convenient payment method. Last-mile logistics service providers can make it easier, both financially and otherwise, for their customers to purchase their services. Accepting various payment methods, such as PayPal and credit cards, and the development of credit plans are salient examples. In addition, the use of GPS and tracking systems enables the dispatch of real-time notifications. This feature can make it easier to avoid failed deliveries and to manage accidents.

3. Methodology

As noted previously, the objective of our research is to identify dimensions that are related to the convenience of HD with CBs and to create a scale for measuring them. We developed the scale by following the procedures of Churchill (1979) and DeVellis (1991), as well as other similar studies (Asiah Omar & Musa, 2011; Bagdare & Jain, 2013; Bhatt et al., 2020; Kumar & Anjaly, 2017). We combined deductive and inductive methods. The deductive method entails the development of a theoretical basis for understanding and defining the construct under observation from the literature. The inductive method involves the generation of items from the responses of individuals, which we obtained from semi-structured interviews (Hinkin, 1995). In more specific terms, we identified the most important studies on the convenience of services in the existing literature (Table I). Accordingly, we define HD convenience as a multidimensional construct that has four components: time, use, execution, and acquisition. Furthermore, we conducted semi-structured interviews in order to develop items that are related to the four dimensions. Finally, we identified the main dimensions through exploratory factor analysis and confirmed the scale through confirmatory factor analysis.

3.1 Creation of the items

We used semi-structured interviews (Amasiatu & Shah, 2019; Foster, 2011) to develop items that measure the convenience of HD by CBs. This approach allows for in-depth questioning—consumers are encouraged to speak freely about any areas they feel are relevant to the topic under examination (Saunders et al., 2015). Six men and four women between the ages of 21 and 50 participated (Table 2). They were asked about their experiences with and perceptions of the convenience of HD by CB. The respondents were familiar with e-commerce and various delivery methods, such as HD and pick-up stations. We reached a saturation point after 10 interviews and determined that collecting further data would yield no novel insights (Charmaz,

2006). We then coded an initial list of 23 items, and two researchers conducted a content analysis (Gavard-Perret & Moscarola, 1996) by using NVivo. Thereafter, three faculty members with experience in the marketing of retail and services assessed the content validity of the list. They were asked to match and refine the items by reference to the four dimensions of convenience: time, use, execution, and acquisition. After the revision, 19 items were retained for factor analysis.

Insert Table 2 about here

3.2 Sample and data collection

In order to collect the data, we used an online questionnaire with 19 items that we assigned to the four dimensions. The respondents rated the items on a five-point Likert scale (1 = “strongly disagree,” 5 = “strongly agree”). We used two filter questions to ensure that the respondents were familiar with e-commerce and various delivery methods, such as HD, drop-offs, and pick-up points. We received a total of 416 validly completed questionnaires (Table 3). We note that 53% of the respondents were female, 55% were between the ages of 35 and 44, and 58% held a master’s degree. Following Hair et al. (2018), we determined that our sample would need to be at least five times larger than the number of variables. Accordingly, we retained 116 responses for exploratory factor analysis. We examined the remainder (300 responses) as part of the confirmatory factor analysis (Asiah Omar & Musa, 2011; Bagdare & Jain, 2013; Childs et al., 2020).

Insert Table 3 about here

4. Data analysis and results

We used SPSS 23 and AMOS 18 for both the exploratory factor analysis and the confirmatory factor analysis.

4.1 Exploratory factor analysis

We conducted an exploratory factor analysis in order to assess the adequacy of the factor model and to test the multidimensionality of the convenience of HD with CBs. We used the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity. The KMO value, 0.875, is larger than 0.5, and the result from Bartlett’s test of sphericity ($\chi^2 = 1,124.787$, $df = 190$, $p \leq 0.0001$) is significant, indicating that the items from the scale are correlated with

each other—the null hypothesis of no correlation can be rejected. Accordingly, the data that we collected is suitable for factor analysis.

We then applied principal component analysis and the varimax rotation method with Kaiser normalization to two ends, namely 1) to consider factors with eigenvalues in excess of one and 2) to remove low commonalities, cross-loadings, and low factor loadings (< 0.5). After five iterations, we removed three items with low cross-loadings (“few out-of-stock situations” (0.34), “easy to move within and find what you are looking for” (0.27), “lower taxes included in the price” (0.39)). The results reveal that there are four factors with eigenvalues larger than one, which explain 65.204% of the total variance. The items load strongly on the factors that they represent (between 0.618 and 0.889). The first factor, *time convenience*, explains the largest proportion (42.039%) of the total variance. It comprises three items that are related to delivery within a reasonable time, respect for promised dates and times, and the flexibility of the time window. The second factor, which we labeled *use convenience*, explains 9.144% of the variance. It measures the use of tracing and tracking during shipment, reductions in CO₂ emissions, respect for privacy, and the safety of the delivery of fragile products. The third factor, *execution convenience*, accounts for 7.487% of the variance and has to do with returns policies, the convenience of the conditions for returns, and direct contact with the delivery agent. The fourth factor is *acquisition convenience* (6.534% of the total variance), which is related to the accuracy of deliveries and to payment methods.

We also calculated Cronbach’s alpha in order to assess the internal consistency of the factors. The Cronbach’s alpha values are as follows: 0.703 for *time convenience*, 0.755 for *use convenience*, 0.796 for *execution convenience*, and 0.654 for *acquisition convenience*. These values are acceptable when compared to the recommended range (0.7–0.6) for scale reliability in exploratory research (Hair et al., 2018; Nunnally & Nunnally, 1978). The results from the exploratory factor analysis are presented in Table 4.

Insert Table 4 about here

4.2 Confirmatory factor analysis

We conducted the confirmatory factor analysis by using the maximum likelihood method in order to verify the factor structure and to examine the reliability as well as the convergent and discriminant validity of the convenience-of-delivery scale for CBs. Since the standardized factor loadings for two items from *use convenience* and *acquisition convenience* are below the acceptable threshold of 0.5 (Table 5), we removed them (Bagozzi & Yi, 1988). The loadings

for all of the 14 items range between 0.654 and 0.868. The values of the fit indices are above the minimum thresholds (Bagozzi & Yi, 1988; Hair et al., 2018). These include the indicators of absolute fit ($\chi^2 = 120.13$, $df = 64$; GFI = 0.944 (> 0.9); RMSEA = 0.054 (< 0.08); SRMR = 0.029 (< 0.04)), of incremental fit (CFI = 0.979 (> 0.95); TLI = 0.970 (> 0.95); NFI = 0.956 (> 0.9)), and of parsimony fit (AGFI = 0.908 (> 0.9); $\chi^2/df = 1.877$ (< 3), $p \leq 0.0001$). The indices therefore confirm the adequate fit of the measurement model.

Insert Table 5 about here

4.3 Tests of reliability and validity

Cronbach's alpha and composite reliability (CR) are used to assess the reliability of the internal consistency of latent factors. The exploratory factor analysis indicates that the Cronbach's alpha values for the four factors range from 0.654 to 0.796 (Table 4). The confirmatory factor analysis indicates that CR takes the following values: 0.844 for *time convenience*, 0.808 for *use convenience*, 0.866 for *execution convenience*, and 0.710 for *acquisition convenience* (Table 5). All of these values are above the threshold of 0.7 (Hair et al., 2018), which demonstrates the adequate reliability of the measurement instrument. We then assessed convergent and discriminant validity. According to Fornell and Larcker (1981), convergent validity indicates the extent to which the assessment measures are correlated with other measures to which they should be related. Convergent validity obtains when average extracted variance (AVE) is larger than or equal to 0.5 (Fornell & Larcker, 1981). As shown in Table 5, the AVE values for each construct in this study are in excess of 50%.

The regression coefficients of the parameter estimates are statistically significant (Table 6), indicating that all observable indicators load significantly on their respective latent factors. Evidently, the convergent validity of the measurement instrument is adequate. We examined discriminant validity by comparing the correlations and the square roots of the AVE scores for each of the pairwise constructs (Fornell & Larcker, 1981). Since none of the correlations exceed the square root of the AVE scores for each pairwise construct (Table 7), the discriminant validity of the measurement instrument was confirmed—the constructs measure distinct concepts.

Insert Table 6 about here

Insert Table 7 about here

5. Concluding remarks

The concept of convenience has been studied in services marketing (Berry et al., 2002; Brown, 1990; Gehrt & Yale, 1993; Morganti et al., 2014; Punakivi & Saranen, 2001) and in retail marketing (Beauchamp & Ponder, 2010; Colwell et al., 2008; Reimers & Clulow, 2009; Seiders et al., 2007). However, research on HD remains scarce. In addition, few studies in this domain focus on the perspective of consumers. As Jiang et al. (2013) pointed out, convenience is a contextual concept. This study adds to the literature and contributes to the understanding of consumer perceptions of the convenience of last-mile delivery. In developing a parsimonious measurement tool, the HDCCB scale, we identified the important factors that explain the manner in which customers evaluate the convenience of home delivery.

HD convenience, a multidimensional construct, measures each facet of the four dimensions (time, use, execution, and acquisition). These dimensions explain 65% of the variance. Among them, the time dimension accounts for 42%, the largest proportion. Evidently, consumers perceive convenience primarily in terms of the flexibility that the available time windows afford to them, which accords with Ghajargar et al.'s (2016) findings. Therefore, home delivery via CBs meets consumers' expectations about speed, flexibility, and product traceability. CBs are a promising solution for companies and e-retailers that are eager to improve the quality of their services in last-mile logistics.

We were also motivated by the environmental issues that HD raises for last-mile logistics providers. Many consumers are looking for a more environmentally friendly means of consuming that does not entail forgoing certain goods and services, such as HD (Schliwa et al., 2015). Companies that use CBs to make HDs can benefit from the brand image of an environmentally friendly business that is committed to sustainability, which could generate a competitive advantage. E-retailers and last-mile logistics providers could use the measurement tool that we proposed to evaluate consumer perceptions of the convenience of HD.

5.1 Limitations

The study focused on consumer perceptions of the convenience of the last-mile delivery of goods on CBs by identifying, developing, and measuring the dimensions of convenience. Psychological and contextual factors might also be important to the choice of delivery method, but we did not consider them. In addition, we only examined online experiences, and we did not discriminate between types of products. Nevertheless, the results are generalizable to all retailers with an online presence. Finally, the research was conducted in France and with

French consumers. The replication of this study in contexts other than European city centers could yield interesting results, especially given that consumers' perceptions vary with their sociodemographic and cultural characteristics.

5.2 Directions for future research

Consumer perceptions of convenience are influenced by sociodemographic and cultural factors (Bergadaa, 1990; Durrande-Moreau & Usunier, 1999), which highlights the importance of testing our proposed scale in different countries and of considering the influence of variables such as age and gender. Another possibility would be to develop a convenience scale that refers to CB energy sources other than electricity. Batteries remain environmentally problematic due to the difficulty of destroying them once they are no longer usable (Mancini, 2017). Energy sources such as hydrogen can yield superior results for HD, leading to more favorable findings about the convenience variables. In addition, the use of renewable and thus more sustainable energy sources, such as solar and wind energy, could also produce superior results.

References

- Ageron, B., & Marty, J. (2022). Connecting the customer to the supply chain : Proposition of a conceptual framework. *European J. of International Management*, 1(1), 1. <https://doi.org/10.1504/EJIM.2022.10050931>
- Amasiatu, C. V., & Shah, M. H. (2019). The management of first party fraud in e-tailing : A qualitative study. *International Journal of Retail & Distribution Management*, 47(4), 433-452. <https://doi.org/10.1108/IJRDM-07-2017-0142>
- Anosike, A., Loomes, H., Udokporo, C. K., & Garza-Reyes, J. A. (2021). Exploring the challenges of electric vehicle adoption in final mile parcel delivery. *International Journal of Logistics Research and Applications*, 1-25. <https://doi.org/10.1080/13675567.2021.1978409>
- Asiah Omar, N., & Musa, R. (2011). Measuring service quality in retail loyalty programmes (LPSQual) : Implications for retailers' retention strategies. *International Journal of Retail & Distribution Management*, 39(10), 759-784. <https://doi.org/10.1108/09590551111162257>
- Bagdare, S., & Jain, R. (2013). Measuring retail customer experience. *International Journal of Retail & Distribution Management*, 41(10), 790-804. <https://doi.org/10.1108/IJRDM-08-2012-0084>

- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-94. <https://doi.org/10.1007/BF02723327>
- Beauchamp, M. B., & Ponder, N. (2010). Perceptions of Retail Convenience for in-store and Online Shoppers. *Marketing Management Journal*, 20(1), 49-65.
- Bergadaa, M. M. (1990). The Role of Time in the Action of the Consumer. *Journal of Consumer Research*, 17(3), 289. <https://doi.org/10.1086/208558>
- Berry, L. L., Seiders, K., & Grewal, D. (2002). Understanding Service Convenience. *Journal of Marketing*, 66(3), 1-17. <https://doi.org/10.1509/jmkg.66.3.1.18505>
- Bhatt, G., Sarkar, A., & Sarkar, J. G. (2020). Attractive and facilitating store atmospheric stimuli: Validating the scales. *International Journal of Retail & Distribution Management*, 48(4), 363-379. <https://doi.org/10.1108/IJRDM-07-2018-0142>
- Bhuyan, A., Tripathy, A., Padhy, R. K., & Gautam, A. (2022). Evaluating the lithium-ion battery recycling industry in an emerging economy: A multi-stakeholder and multi-criteria decision-making approach. *Journal of Cleaner Production*, 331, 130007. <https://doi.org/10.1016/j.jclepro.2021.130007>
- Brown, L. G. (1989). The Strategic and Tactical Implications of Convenience in Consumer Product Marketing. *Journal of Consumer Marketing*, 6(3), 13-19. <https://doi.org/10.1108/EUM0000000002550>
- Brown, L. G. (1990). Convenience in Services Marketing. *Journal of Services Marketing*, 4(1), 53-59. <https://doi.org/10.1108/EUM0000000002505>
- Browne, M., Allen, J., & Leonardi, J. (2011). Evaluating the use of an urban consolidation centre and electric vehicles in central London. *IATSS Research*, 35(1), 1-6. <https://doi.org/10.1016/j.iatssr.2011.06.002>
- Buldeo Rai, H., Verlinde, S., & Macharis, C. (2019). The “next day, free delivery” myth unravelled: Possibilities for sustainable last mile transport in an omnichannel environment. *International Journal of Retail & Distribution Management*, 47(1), 39-54. <https://doi.org/10.1108/IJRDM-06-2018-0104>
- Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis*. Sage Publications.
- Chekembayeva, G., Garaus, M., & Schmidt, O. (2023). The role of time convenience and (anticipated) emotions in AR mobile retailing application adoption. *Journal of Retailing and Consumer Services*, 72, 103260. <https://doi.org/10.1016/j.jretconser.2023.103260>

- Childs, M., Blanchflower, T., Hur, S., & Matthews, D. (2020). Non-traditional marketplaces in the retail apocalypse : Investigating consumers' buying behaviours. *International Journal of Retail & Distribution Management*, 48(3), 262-286. <https://doi.org/10.1108/IJRDM-03-2019-0079>
- Churchill, G. A. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*, 16(1), 64-73. <https://doi.org/10.1177/002224377901600110>
- Clulow, V., & Reimers, V. (2009). How do Consumers Define Retail Centre Convenience? *Australasian Marketing Journal*, 17(3), 125-132. <https://doi.org/10.1016/j.ausmj.2009.05.015>
- Colwell, S. R., Aung, M., Kanetkar, V., & Holden, A. L. (2008). Toward a measure of service convenience : Multiple-item scale development and empirical test. *Journal of Services Marketing*, 22(2), 160-169. <https://doi.org/10.1108/08876040810862895>
- Copeland, M. (1923). Relation of Consumers : Buying Habits to Marketing Methods. *Harvard Business Review*, 282-289.
- Dai, H., & Salam, A. F. (2014). Does service convenience matter? An empirical assessment of service quality, service convenience and exchange relationship in electronic mediated environment. *Electronic Markets*, 24(4), 269-284. <https://doi.org/10.1007/s12525-014-0170-x>
- Dalla Chiara, G., Donnelly, G., Gunes, S., & Goodchild, A. (2023). How cargo cycle drivers use the urban transport infrastructure. *Transportation Research Part A: Policy and Practice*, 167, 103562. <https://doi.org/10.1016/j.tra.2022.103562>
- DeVellis, R. F. (1991). *Scale Development : Theory and Applications*. SAGE Publications.
- Durrande-Moreau, A., & Usunier, J.-C. (1999). Time Styles and the Waiting Experience : An Exploratory Study. *Journal of Service Research*, 2(2), 173-186. <https://doi.org/10.1177/109467059922005>
- Faugère, L., Klibi, W., White, C., & Montreuil, B. (2022). Dynamic pooled capacity deployment for urban parcel logistics. *European Journal of Operational Research*, 303(2), 650-667. <https://doi.org/10.1016/j.ejor.2022.02.051>
- Fontaine, P. (2022). The vehicle routing problem with load-dependent travel times for cargo bicycles. *European Journal of Operational Research*, 300(3), 1005-1016. <https://doi.org/10.1016/j.ejor.2021.09.009>

- Fontaine, P., Crainic, T. G., Jabali, O., & Rei, W. (2021). Scheduled service network design with resource management for two-tier multimodal city logistics. *European Journal of Operational Research*, 294(2), 558-570. <https://doi.org/10.1016/j.ejor.2021.02.009>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39. <https://doi.org/10.2307/3151312>
- Foster, C. (2011). Using scenarios to explore employee attitudes in retailing. *International Journal of Retail & Distribution Management*, 39(3), 218-228. <https://doi.org/10.1108/09590551111115042>
- Fransoo, J. C., Blanco, E. E., & Mejía-Argueta, C. (2017). *Reaching 50 million nanostores : Retail in distribution in emerging megacities*. CreateSpace Independent Publishing Platform.
- Gavard-Perret, M.-L., & Moscarola, J. (1996). Lexical analysis in Marketing : Discovering the contents of the message or recognizing the models of enunciation. In *French-German Workshop on New Developments and Approaches in Consumer Behavior Research* (p. 40-59).
- Gehrt, K. C., & Yale, L. J. (1993). The dimensionality of the convenience phenomenon : A qualitative reexamination. *Journal of Business and Psychology*, 8(2), 163-180. <https://doi.org/10.1007/BF02230383>
- Gevaers, R., Voorde, E., & Vanelslander, T. (2009). Characteristics of Innovations in Last-Mile Logistics—Using Best Practices, Case Studies and Making the Link with Green and Sustainable Logistics. *Business*.
- Ghajargar, M., Zenezini, G., & Montanaro, T. (2016). Home delivery services : Innovations and emerging needs. *IFAC-PapersOnLine*, 49(12), 1371-1376. <https://doi.org/10.1016/j.ifacol.2016.07.755>
- Goeke, D., & Schneider, M. (2015). Routing a mixed fleet of electric and conventional vehicles. *European Journal of Operational Research*, 245(1), 81-99. <https://doi.org/10.1016/j.ejor.2015.01.049>
- Gruber, J., Kihm, A., & Lenz, B. (2014). A new vehicle for urban freight? An ex-ante evaluation of electric cargo bikes in courier services. *Research in Transportation Business & Management*, 11, 53-62. <https://doi.org/10.1016/j.rtbm.2014.03.004>
- Gu, X., Ieromonachou, P., & Zhou, L. (2019). Subsidising an electric vehicle supply chain with imperfect information. *International Journal of Production Economics*, 211, 82-97. <https://doi.org/10.1016/j.ijpe.2019.01.021>

- Hair, J. F., Babin, B. J., Anderson, & Black. (2018). *Multivariate Data Analysis* (8th edition). Cengage Learning EMEA.
- Hinkin, T. R. (1995). A Review of Scale Development Practices in the Study of Organizations. *Journal of Management*, 21(5), 967-988. <https://doi.org/10.1177/014920639502100509>
- Ibáñez-Sánchez, S., Orús, C., & Flavián, C. (2022). Augmented reality filters on social media. Analyzing the drivers of playability based on uses and gratifications theory. *Psychology & Marketing*, 39(3), 559-578. <https://doi.org/10.1002/mar.21639>
- Jiang, L. (Alice), Yang, Z., & Jun, M. (2013). Measuring consumer perceptions of online shopping convenience. *Journal of Service Management*, 24(2), 191-214. <https://doi.org/10.1108/09564231311323962>
- Jie, W., Yang, J., Zhang, M., & Huang, Y. (2019). The two-echelon capacitated electric vehicle routing problem with battery swapping stations: Formulation and efficient methodology. *European Journal of Operational Research*, 272(3), 879-904. <https://doi.org/10.1016/j.ejor.2018.07.002>
- Kalaitzi, D., Matopoulos, A., & Clegg, B. (2019). Managing resource dependencies in electric vehicle supply chains: A multi-tier case study. *Supply Chain Management: An International Journal*, 24(2), 256-270. <https://doi.org/10.1108/SCM-03-2018-0116>
- Kumar, A., & Anjaly, B. (2017). How to measure post-purchase customer experience in online retailing? A scale development study. *International Journal of Retail & Distribution Management*, 45(12), 1277-1297. <https://doi.org/10.1108/IJRDM-01-2017-0002>
- Lagin, M., Håkansson, J., Nordström, C., Nyberg, R. G., & Öberg, C. (2022). Last-mile logistics of perishable products: A review of effectiveness and efficiency measures used in empirical research. *International Journal of Retail & Distribution Management*, 50(13), 116-139. <https://doi.org/10.1108/IJRDM-02-2021-0080>
- Leonardi, J., Browne, M., & Allen, J. (2012). Before-After Assessment of a Logistics Trial with Clean Urban Freight Vehicles: A Case Study in London. *Procedia - Social and Behavioral Sciences*, 39, 146-157. <https://doi.org/10.1016/j.sbspro.2012.03.097>
- Liang, C.-J., & Wang, W.-H. (2006). The behavioural sequence of the financial services industry in Taiwan: Service quality, relationship quality and behavioural loyalty. *The Service Industries Journal*, 26(2), 119-145. <https://doi.org/10.1080/02642060500369131>

- Louis, D., Lombart, C., & Durif, F. (2019). Impact of a retailer's CSR activities on consumers' loyalty. *International Journal of Retail & Distribution Management*, 47(8), 793-816. <https://doi.org/10.1108/IJRDM-12-2018-0262>
- Ma, B., Wong, Y. D., & Teo, C.-C. (2022). Parcel self-collection for urban last-mile deliveries : A review and research agenda with a dual operations-consumer perspective. *Transportation Research Interdisciplinary Perspectives*, 16, 100719. <https://doi.org/10.1016/j.trip.2022.100719>
- Mancini, S. (2017). The Hybrid Vehicle Routing Problem. *Transportation Research Part C: Emerging Technologies*, 78, 1-12. <https://doi.org/10.1016/j.trc.2017.02.004>
- Manerba, D., Mansini, R., & Zanotti, R. (2018). Attended Home Delivery : Reducing last-mile environmental impact by changing customer habits. *IFAC-PapersOnLine*, 51(5), 55-60. <https://doi.org/10.1016/j.ifacol.2018.06.199>
- Mashalah, H. A., Hassini, E., Gunasekaran, A., & Bhatt (Mishra), D. (2022). The impact of digital transformation on supply chains through e-commerce : Literature review and a conceptual framework. *Transportation Research Part E: Logistics and Transportation Review*, 165, 102837. <https://doi.org/10.1016/j.tre.2022.102837>
- Melkonyan, A., Gruchmann, T., Lohmar, F., Kamath, V., & Spinler, S. (2020). Sustainability assessment of last-mile logistics and distribution strategies : The case of local food networks. *International Journal of Production Economics*, 228, 107746. <https://doi.org/10.1016/j.ijpe.2020.107746>
- Melo, S., & Baptista, P. (2017). Evaluating the impacts of using cargo cycles on urban logistics : Integrating traffic, environmental and operational boundaries. *European Transport Research Review*, 9(2), 30. <https://doi.org/10.1007/s12544-017-0246-8>
- Miao, R., Xu, F., Zhang, K., & Jiang, Z. (2014). Development of a multi-scale model for customer perceived value of electric vehicles. *International Journal of Production Research*, 52(16), 4820-4834. <https://doi.org/10.1080/00207543.2014.890757>
- Monios, J., & Bergqvist, R. (2020). Logistics and the networked society : A conceptual framework for smart network business models using electric autonomous vehicles (EAVs). *Technological Forecasting and Social Change*, 151, 119824. <https://doi.org/10.1016/j.techfore.2019.119824>
- Morganti, E., Dablanc, L., & Fortin, F. (2014). Final deliveries for online shopping : The deployment of pickup point networks in urban and suburban areas. *Research in Transportation Business & Management*, 11, 23-31. <https://doi.org/10.1016/j.rtbm.2014.03.002>

- Mühlbauer, F., & Fontaine, P. (2021). A parallelised large neighbourhood search heuristic for the asymmetric two-echelon vehicle routing problem with swap containers for cargo-bicycles. *European Journal of Operational Research*, 289(2), 742-757. <https://doi.org/10.1016/j.ejor.2020.07.034>
- Muñoz-Villamizar, A., Quintero-Araújo, C. L., Montoya-Torres, J. R., & Faulin, J. (2019). Short- and mid-term evaluation of the use of electric vehicles in urban freight transport collaborative networks : A case study. *International Journal of Logistics Research and Applications*, 22(3), 229-252. <https://doi.org/10.1080/13675567.2018.1513467>
- Nunnally, J. C., & Nunnally, J. C. (1978). *Psychometric Theory*. McGraw-Hill.
- Olsson, J., Hellström, D., & Pålsson, H. (2019). *Exploring past achievements in last mile logistics research : A literature review*. 31ST NOFOMA Conference. <http://lup.lub.lu.se/record/f62e6256-bded-4a4f-8885-2f667eb9f0d8>
- Ouyang, Z., Leung, E. K. H., & Huang, G. Q. (2023). Community logistics and dynamic community partitioning : A new approach for solving e-commerce last mile delivery. *European Journal of Operational Research*, 307(1), 140-156. <https://doi.org/10.1016/j.ejor.2022.08.029>
- Pantano, E., Rese, A., & Baier, D. (2017). Enhancing the online decision-making process by using augmented reality : A two country comparison of youth markets. *Journal of Retailing and Consumer Services*, 38, 81-95. <https://doi.org/10.1016/j.jretconser.2017.05.011>
- Population Reference Bureau. (2022). *Share of urban population worldwide in 2022, by continent*. <https://www-statista-com.devinci.idm.oclc.org/statistics/270860/urbanization-by-continent/>
- Punakivi, M., & Saranen, J. (2001). Identifying the success factors in e-grocery home delivery. *International Journal of Retail & Distribution Management*, 29(4), 156-163. <https://doi.org/10.1108/09590550110387953>
- Raeesi, R., & Zografos, K. G. (2022). Coordinated routing of electric commercial vehicles with intra-route recharging and en-route battery swapping. *European Journal of Operational Research*, 301(1), 82-109. <https://doi.org/10.1016/j.ejor.2021.09.037>
- Reimers, V. (2014). A consumer definition of store convenience (finally). *International Journal of Retail & Distribution Management*, 42(4), 315-333. <https://doi.org/10.1108/IJRDM-03-2013-0060>

- Reimers, V., & Clulow, V. (2009). Retail centres : It's time to make them convenient. *International Journal of Retail & Distribution Management*, 37(7), 541-562. <https://doi.org/10.1108/09590550910964594>
- Reimers, V., & Clulow, V. (2014). Spatial convenience : Bridging the gap between shopping malls and shopping strips. *International Journal of Retail & Distribution Management*, 42(10), 864-883. <https://doi.org/10.1108/IJRDM-08-2013-0153>
- Rejeb, A., Rejeb, K., Simske, S. J., & Treiblmaier, H. (2021). Drones for supply chain management and logistics : A review and research agenda. *International Journal of Logistics Research and Applications*, 1-24. <https://doi.org/10.1080/13675567.2021.1981273>
- Risberg, A., & Jafari, H. (2022). Last mile practices in e-commerce : Framework development and empirical analysis of Swedish firms. *International Journal of Retail & Distribution Management*, 50(8/9), 942-961. <https://doi.org/10.1108/IJRDM-10-2021-0513>
- Rudolph, C., & Gruber, J. (2017). Cargo cycles in commercial transport : Potentials, constraints, and recommendations. *Research in Transportation Business & Management*, 24, 26-36. <https://doi.org/10.1016/j.rtbm.2017.06.003>
- Ruoso, A. C., & Ribeiro, J. L. D. (2022). An assessment of barriers and solutions for the deployment of electric vehicles in the Brazilian market. *Transport Policy*, 127, 218-229. <https://doi.org/10.1016/j.tranpol.2022.09.004>
- Salhieh, L., Shehadeh, M., Abushaikha, I., & Towers, N. (2021). Integrating vehicle tracking and routing systems in retail distribution management. *International Journal of Retail & Distribution Management*, 49(8), 1154-1177. <https://doi.org/10.1108/IJRDM-12-2019-0400>
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2015). *Research Methods for Business Students* (7th edition). Pearson.
- Savelsbergh, M., & Van Woensel, T. (2016). 50th Anniversary Invited Article—City Logistics : Challenges and Opportunities. *Transportation Science*, 50(2), 579-590. <https://doi.org/10.1287/trsc.2016.0675>
- Schliwa, G., Armitage, R., Aziz, S., Evans, J., & Rhoades, J. (2015). Sustainable city logistics—Making cargo cycles viable for urban freight transport. *Research in Transportation Business & Management*, 15, 50-57. <https://doi.org/10.1016/j.rtbm.2015.02.001>

- Seiders, K., Voss, G. B., Godfrey, A. L., & Grewal, D. (2007). SERVCON : Development and validation of a multidimensional service convenience scale. *Journal of the Academy of Marketing Science*, 35(1), 144-156. <https://doi.org/10.1007/s11747-006-0001-5>
- Sheth, M., Butrina, P., Goodchild, A., & McCormack, E. (2019). Measuring delivery route cost trade-offs between electric-assist cargo bicycles and delivery trucks in dense urban areas. *European Transport Research Review*, 11(1), 11. <https://doi.org/10.1186/s12544-019-0349-5>
- Sopjani, L., Stier, J. J., Hesselgren, M., & Ritzén, S. (2020). Shared mobility services versus private car : Implications of changes in everyday life. *Journal of Cleaner Production*, 259, 120845. <https://doi.org/10.1016/j.jclepro.2020.120845>
- Sushandoyo, D., & Magnusson, T. (2014). Strategic niche management from a business perspective : Taking cleaner vehicle technologies from prototype to series production. *Journal of Cleaner Production*, 74, 17-26. <https://doi.org/10.1016/j.jclepro.2014.02.059>
- Teller, C., Brusset, X., & Kotzab, H. (2019). Physical and digital market places – where marketing meets operations. *International Journal of Retail & Distribution Management*, 47(12), 1225-1231. <https://doi.org/10.1108/IJRDM-12-2019-299>
- UN DESA. (2018). *Percentage of population living in urban areas worldwide from 1950 to 2050, by regional development*. <https://www-statista-com.devinci.idm.oclc.org/statistics/671366/change-in-urbanization-of-countries-worldwide-by-regional-development/>
- Vakulenko, Y., Shams, P., Hellström, D., & Hjort, K. (2019). Service innovation in e-commerce last mile delivery : Mapping the e-customer journey. *Journal of Business Research*, 101, 461-468. <https://doi.org/10.1016/j.jbusres.2019.01.016>
- van Lopik, K., Schnieder, M., Sharpe, R., Sinclair, M., Hinde, C., Conway, P., West, A., & Maguire, M. (2020). Comparison of in-sight and handheld navigation devices toward supporting industry 4.0 supply chains : First and last mile deliveries at the human level. *Applied Ergonomics*, 82, 102928. <https://doi.org/10.1016/j.apergo.2019.102928>
- Wang, M., Zhang, C., Bell, M. G. H., & Miao, L. (2022). A branch-and-price algorithm for location-routing problems with pick-up stations in the last-mile distribution system. *European Journal of Operational Research*, 303(3), 1258-1276. <https://doi.org/10.1016/j.ejor.2022.03.058>

- Wang, Y., Ko, E., & Wang, H. (2022). Augmented reality (AR) app use in the beauty product industry and consumer purchase intention. *Asia Pacific Journal of Marketing and Logistics*, 34(1), 110-131. <https://doi.org/10.1108/APJML-11-2019-0684>
- Wu, J., Du, G., & Jiao, R. J. (2021). Optimal postponement contracting decisions in crowdsourced manufacturing : A three-level game-theoretic model for product family architecting considering subcontracting. *European Journal of Operational Research*, 291(2), 722-737. <https://doi.org/10.1016/j.ejor.2020.09.049>
- Yuen, K. F., Wang, X., Ng, L. T. W., & Wong, Y. D. (2018). An investigation of customers' intention to use self-collection services for last-mile delivery. *Transport Policy*, 66, 1-8. <https://doi.org/10.1016/j.tranpol.2018.03.001>
- Zhang, C., Tian, Y.-X., & Han, M.-H. (2022). Recycling mode selection and carbon emission reduction decisions for a multi-channel closed-loop supply chain of electric vehicle power battery under cap-and-trade policy. *Journal of Cleaner Production*, 375, 134060. <https://doi.org/10.1016/j.jclepro.2022.134060>
- Zhang, S., Chen, M., Zhang, W., & Zhuang, X. (2020). Fuzzy optimization model for electric vehicle routing problem with time windows and recharging stations. *Expert Systems with Applications*, 145, 113123. <https://doi.org/10.1016/j.eswa.2019.113123>

Table I. Dimensions of convenience in previous studies

Source	Dimensions of convenience	Context
Brown (1990)	Time/place, acquisition, use, execution and convenience	Services in general
Gehrt & Yale (1993)	Time, place, and effort	Services in general
Berry <i>et al.</i> , (2002); Colwell <i>et al.</i> , (2008); Seiders <i>et al.</i> , (2007)	Decision, access, transaction, benefits, and post-benefit convenience	Services in retail
Clulow & Reimers (2009); Reimers & Clulow (2009)	Time, car, spatial, hedonic shopping, and effort convenience	Retail centers
Beauchamp & Ponder (2010)	Access, search, transaction, and possession convenience	Retail, in-store and online
Pantano <i>et al.</i> (2017)	Perceived usefulness	Online retailers
Ibáñez-Sánchez <i>et al.</i> (2022)	Perceived convenience	Social media
Wang, Ko, <i>et al.</i> (2022)	Decision comfort	Beauty industry
Ibáñez-Sánchez <i>et al.</i> (2022)	Passing time	Social media
Chekembayeva <i>et al.</i> (2023)	Time convenience	Mobile retail applications

Table by authors**Table II. Sociodemographic description of the interviewees**

N.	Gender	Age (years)	Professional status	Experience (e-commerce platforms)
1	Woman	50	Advertising director	Uber Eats, Delivroo
2	Woman	34	Osteopath	Amazon, Veepee, Monopdelivery
3	Woman	47	Nursery director	Amazon
4	Woman	22	Student	Uber Eats
5	Man	22	Student	Amazon, Asos
6	Man	35	Wine merchant	Amazon
7	Man	21	Student	Uber Eats, Amazon
8	Man	23	Delicatessen seller	Amazon
9	Man	50	Supply chain manager	Uber Eats, Deliveroo
10	Man	31	Commercial agent	Uber Eats, Food Cheri

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Table III. Sample description

Demographic factor		Frequency	Percentage
Gender	Male	195	47
	Female	221	53
	Total	416	100
Age	18 to 24	44	11
	25 to 34	69	17
	35 to 44	230	55
	45 to 54	56	13
	55 to 64	17	4
	Total	416	100
Education	Bachelor	157	38
	Master	243	58
	Ph.D.	16	4
	Total	416	100
Occupation	Student	77	19
	Employee	21	5
	Retailer	59	14
	Senior	259	62
	Total	416	100

Table by authors

Table IV. Results of the EFA

Factors	Items	Factor loadings	Eigenvalues	% of variance	Cronbach's alpha
Time convenience	Delivery in a reasonable time	0.745	6.726	42.039	0.703
	Respect for promised date and time	0.736			
	Flexibility of delivery time window	0.618			
Use convenience	Tracing and tracking during shipment	0.700	1.463	9.144	0.755
	Fewer emissions of CO2	0.641			
	Respect of privacy	0.625			
	Safety of delivery of fragile products	0.657			
Execution convenience	Products received undamaged	0.772	1.198	7.487	0.796
	Ease of return products	0.741			
	Return policy and conditions are convenient	0.684			

	Personnel contact with the delivery guy who is willing to help	0.706			
	The delivery guy acts as an ambassador of the product or retail brand	0.807			
Acquisition convenience	Accuracy, error-free sales transactions, and home delivery records	0.889	1.045	6.534	0.654
	The payment terms seem correct	0.731			
	Mobile payment (QR Code)	0.823			
	Offer on the next delivery (E.g., voucher)	0.689			
Overall scale				65.204	0.886

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Table V. Measurement model results

Factors	Items	Factor loadings	CR	AVE
Time convenience	(1) Delivery in a reasonable time	0.826	0.844	0.643
	(2) Respect of (promised date and time)	0.815		
	(3) Flexibility of delivery time window	0.754		
Use convenience	(1) Tracing and tracking during shipment	0.731	0.808	0.513
	(2) Respect of privacy*	0.44		
	(3) Fewer emissions of CO2	0.693		
	(4) Safety of delivery of fragile products	0.743		
Execution convenience	(1) Products received undamaged	0.868	0.866	0.567
	(2) Ease of returning products	0.740		
	(3) Return policy and conditions are convenient	0.743		
	(4) Personnel contact with the delivery guy who is willing to help	0.654		
	(5) The delivery guy acts as an ambassador of the product or retail brand	0.807		
Acquisition convenience	(1) Accuracy, error-free sales transactions, and home delivery records	0.790	0.710	0.534
	(2) The payment terms seem correct	0.708		
	(3) Mobile payment (QR Code)	0.692		
	(4) Offer on the next delivery (e.g., voucher)*	0.38		

*Items with loadings below the acceptable threshold of 0.5 were removed

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Table VI. Parameter estimates – regression weights

		Estimate	SE	CR	P
Time3	<--- Time	0.944	0.065	14.483	***
Time2	<--- Time	0.986	0.059	16.664	***
Time1	<--- Time	1.000			
Use3	<--- Use	1.000			
Use2	<--- Use	0.929	0.075	12.407	***
Use1	<--- Use	0.962	0.073	13.168	***
Exec5	<--- Execution	1.000			
Exec4	<--- Execution	0.929	0.077	12.116	***
Exec3	<--- Execution	0.980	0.063	15.570	***
Exec2	<--- Execution	0.948	0.067	14.219	***
Exec1	<--- Execution	0.986	0.063	15.745	***
Acq3	<--- Acquisition	0.359	0.109	3.280	.001
Acq2	<--- Acquisition	0.995	0.074	13.379	***
Acq1	<--- Acquisition	1.000			

Note: ***p value significant at the level 0.0001

Table by authors

Table VII. Convergent and discriminant validity

	Mean	SD	1	2	3	4
(1) Time (3 items)	4.07	0.80	<i>0.80</i>			
(2) Use (3 items)	4.06	0.89	0.55	<i>0.71</i>		
(3) Execution (5 items)	4.00	0.87	0.58	0.60	<i>0.75</i>	
(4) Acquisition (3 items)	3.48	0.77	0.39	0.51	0.49	<i>0.73</i>

Notes: The square root of AVE scores are represented on the diagonal, the correlations coefficients between constructs are represented below the diagonal.

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