Perceptions of Time and Adoption of On-Demand Digital Services

(Preprint)

Abstract:
On-demand digital services promise minimal wait time between order and fulfilment across various consumption sectors. While it enhances convenience, expedited fulfilment may increase carbon emissions. Despite the central role of immediacy in these services and its environmental implications, few studies have explored the links between perceptions of time and service adoption. This study investigates how individuals' experiences of time scarcity and pace of life shape their perception of on-demand services, and in turn, their adoption and willingness to wait for three types of on-demand services delivered through digital platforms: next-day retail, online food delivery, and ride-hailing. We use regression models to analyse cross-sectional survey data from 1,512 respondents in the United Kingdom including adopters and non-adopters. We find that individuals with a higher pace of life and time scarcity are more likely to perceive a higher relative advantage of on-demand digital services. Relative advantage, along with compatibility and complexity, are strong predictors of adoption across all three services. Additionally, we find that users of ride-hailing and next-day retail exhibit a lower willingness to wait but users of online food delivery do not. These findings highlight the links between perceptions of time and on demand digital services usage, with critical implications for sustainability. If on-demand digital services continue to grow and entrench expectations of faster delivery, this could have detrimental implications on the environment through increases in energy use and carbon emissions from expedited delivery. On-demand services must manage customer expectations and consider other value propositions that balances environmental sustainability.

Keywords: food delivery, time scarcity, pace of life, diffusion of innovation, ride-hailing, digitalisation, e-retail, e-commerce

1. Introduction

On-demand digital services have transformed the consumption experience by providing time-sensitive consumers with conveniences and faster delivery (Taylor, 2018; Van Der Burg *et al.*, 2019). On-demand digital services are technology-enabled platforms that allow consumers to request and receive goods or services within a short time frame. This ability is enabled by real-time data flow and advanced algorithms to match consumers and suppliers and optimise fulfilment (Lim *et al.*, 2023). Examples of on-demand digital services providing physical goods or services include ride-hailing, online food delivery, or next-day delivery retail. Ride-hailing (e.g., Uber, Bolt) uses algorithms to match consumers with drivers and to optimise routing (Uber, 2015). Similarly, online food delivery (e.g., Deliveroo) and instant grocery delivery connect consumers, businesses, and delivery partners in real time. Meanwhile, Amazon delivers tens of millions of items on the same day or the next day by streamlining inventory stocking, packing, and shipping in its fulfilment centres (Alimahomed-Wilson, 2020; Amazon, 2023). Major online retailers are following Amazon's lead and investing in supply chain management and last-mile logistics to expedite their delivery (Ecker *et al.*, 2020). The common objective across these services is faster fulfilment.

On-demand services enabled by digital platforms continue to gain popularity among mainstream consumers (Colby and Bell, 2016; Smith, 2016; Dablanc *et al.*, 2017). Industry experts predict these services will grow in response to customer demand for ever-faster delivery (Joerss *et al.*, 2016; Ecker *et al.*, 2020; Ahuja *et al.*, 2021; Metapack, 2024). Simultaneously, on-demand digital services have caused the emergence of an on-demand society that expects instant delivery and abundance (Tomlinson, 2007; Tyron, 2013). The rise in on-demand digital services and consumers' expectations of faster delivery are mutually reinforcing each other in a feedback loop of increasing immediacy.

While immediacy is the distinguishing feature of on-demand digital services, little research on the adoption and use of such services has thus far examined consumers' perceptions of time and expectations (Faber and de Reuver, 2019; Tyrväinen and Karjaluoto, 2019). Perceptions of time refer to individuals' subjective experiences and evaluations of time, including how scarce, valuable, or fast-paced it feels (Southerton, 2020). The research gap persists despite longstanding evidence linking perceptions of time to consumer behaviour such as the adoption of time-saving products and services (Kaufman-Scarborough and Lindquist, 2003) and consumption patterns being embedded in temporalities (Southerton, 2020).

Research on perceptions of time, expectations, and the resulting adoption and use of on-demand services is timely and crucial because they influence the sustainability of digital services. Faster delivery requires greater resources, prevents efficient consolidation, and transforms logistics and provisioning systems (Allen, Piecyk and Piotrowska, 2018; Piecyk *et al.*, 2021). Instant delivery is linked to increases in energy use, inefficiencies, pollution, congestion, and carbon emissions, whether in food delivery (Heldt *et al.*, 2019; Allen *et al.*, 2021; Xie, Xu and Li, 2021; Lord *et al.*, 2023; Pourrahmani, Jaller and Fitch-Polse, 2023), ride-hailing (Skov, Toneys and Brown, 2020; Tirachini, 2020), or retail (Allen *et al.*, 2018; Lin, Zhou and Du, 2018; Buldeo Rai, Verlinde and Macharis, 2019; Kang *et al.*, 2021; Brylla and Walsh, 2022). As an example, a case study in China estimates reducing one day of delivery time for online shopping can increase greenhouse gas emissions by four times per delivery on average (Kang *et al.*, 2021). If on-demand digital services continue to grow and entrench expectations of faster delivery, this could have detrimental implications on the environment. Research is needed into how perceptions of time affect the adoption of on-demand digital services and how the use of on-demand digital services might influence expectations of speed. Therefore, this paper explores the following research questions:

1) How do time scarcity and pace of life influence perceptions of on-demand digital services?
2) How do perceptions of on-demand digital services affect likelihood of adoption?
3) How does the adoption of on-demand digital services affect willingness to wait?

2. Literature review

2.1. On-demand digital services

On-demand digital service is a business model facilitated through an online (mobile) platform that can meet customers' demands immediately (Taylor, 2018; Kim, Park and Lee, 2019; Van Der Burg *et al.*, 2019; Lim *et al.*, 2023). The focus of on-demand services is to reduce the time gap between order and fulfilment (Van Der Burg *et al.*, 2019). On-demand digital service is most prominent in media with services that provide instant download or streaming of digital content (e.g., movies, music, e-books, audiobooks, games), but it has extended to products and services that require physical fulfilment (e.g., food delivery, e-retail, ride-hailing). They are often referred to as instant delivery (Dablanc *et al.*, 2017) or express delivery (Kang *et al.*, 2021; Zhong, Lomas and Worth, 2022).

Some on-demand digital services have been adopted at scale. Streaming video-on-demand has reached more than two-thirds of households in the United Kingdom (UK) and music streaming is used by more than half of UK adults (Ofcom, 2024). While physical on-demand digital services have not reached such adoption levels, ride-hailing, online food delivery, and next-day delivery retail are now widely used in the UK. Other on-demand digital services, such as instant grocery delivery (e.g., Getir, Tesco Whoosh) or home services (e.g., TaskRabbit, Amazon Home Services) have failed to take off (Bajaj, 2024) (Table 1). The success or failure of a service can result from various organisational, managerial, financing, legal, or logistics issues, but demand-side consumer interest and adoption also play an important role (Guo *et al.*, 2020). The discrepancy in adoption between the on-demand digital services invites further examination of the key factors influencing adoption likelihood.

Table 1. Market data on on-demand digital services with physical fulfilment in the United Kingdom

On-demand digital services	Examples of applications	Usership in the UK
Ride-hailing	Uber, Bolt, FreeNow	18.6 million users (2024) (Statista, 2025d)
Online food delivery	Uber Eats, Just Eat, Deliveroo	36.7 million users (2024) (Statista, 2025b)
Next-day retail	Amazon Prime, ASOS Instant Delivery, Argos Fast Track Delivery	Amazon Prime: 13.3 million households (2024) (Statista, 2025a)
Instant grocery	Tesco Whoosh, Getir	7.3 million users (2024) (Statista, 2025c)
Home services	TaskRabbit	TaskRabbit: 400,000 bookings and 7,500 taskers in 2022 (Taskrabbit, 2022)

2.2. Adoption factors of on-demand digital services

Consumers’ engagement with on-demand digital services is influenced by a complex interplay of technological, social, attitudinal, sociodemographic, and contextual factors. Technological factors, most often included in adoption research, relate to people’s perception of the innovation’s attributes. Perceived benefits and perceived ease-of-use consistently predict intentions to use various on-demand digital services (Delgosha and Hajiheydari, 2020; Lu, Yan and Chen, 2022; Lim *et al.*, 2023), including ride-hailing (Kim, Park and Lee, 2019; Min, So and Jeong, 2019; Acheampong *et al.*, 2020; Akram, Lavuri and Mathur, 2024), mobile shopping (Lu, 2014; Tyrväinen and Karjaluoto, 2019; Luceri *et al.*, 2022; Bianchi and Saleh, 2024), and food delivery (Gani *et al.*, 2023).

Similarly, relative advantage and compatibility also widely predict adoption of innovation (Kapoor, Dwivedi and Williams, 2014; Kim, Park and Lee, 2019; Min, So and Jeong, 2019; Shaw, Eschenbrenner and Brand, 2022). Relative advantage is the extent to which an innovation is perceived to be better than the previous option it supersedes, whether in terms of economic advantage, social status, performance, or features (e.g., convenience or speed) (Rogers, 2003; Flight, D’Souza and Allaway, 2011). Compatibility refers to the perception that the innovation is consistent with a potential adopter's existing values, past experiences, and needs (Rogers, 2003; Kapoor, Dwivedi and Williams, 2014).

The influence of other innovation attributes, such as trialability and observability, is inconclusive and context-dependent (Kapoor, Dwivedi and Williams, 2014). For example, observability was found to be a significant predictor for the intention to use ride-hailing (Min, So and Jeong, 2019) but not for decisions to reuse (Elnadi and Gheith, 2022). Observability was also significant for food delivery (Chakraborty *et al.*, 2022). Meanwhile, trialability is seen to be impactful only in cases with high risk and uncertainty (Banerjee, Wei and Ma, 2012) or only for early adopters when there are few peer adopters (Li *et al.*, 2011).

People's perceptions of the innovation attributes are partly influenced by social factors. A meta-analysis of technology adoption suggests that subjective norm — the perception of whether an individual's social network would approve or disapprove of using an innovation — significantly influences intention to use (Schepers and Wetzels, 2007). Most studies find that social influence affects perceived usefulness of an innovation and supports intentions to use on-demand digital apps (Lim *et al.*, 2023), such as mobile shopping (Kalinic and Marinkovic, 2016; Luceri *et al.*, 2022; Bianchi and Saleh, 2024) or ride-hailing (Min, So and Jeong, 2019; Elnadi and Gheith, 2022; Nguyen and Ha, 2022). Yet, a smaller number of studies find that social influence was not a significant determinant (Lu, 2014; Alalwan, 2020). Social influence can transpire through social media, which facilitates the spread of information about on-demand digital services either through direct advertising (Alalwan *et al.*, 2017) or electronic word-of-mouth (Zhang *et al.*, 2017; Lim *et al.*, 2023) which then drive adoption of digital innovations (Dutton and Blank, 2015; Abbasi *et al.*, 2024).

Attitudinal factors also shape how they perceive an innovation. A wide range of attitudes have been identified, such as pro-environmental views or variety-seeking tendency, but the most common attitude associated with innovation adoption is openness to technology (Alemi *et al.*, 2018; Acheampong *et al.*, 2020; Tirachini, 2020). An individual's digital attitude informs how people use various Internet services (Dutton and Blank, 2014). A positive attitude towards the Internet, reflected in an openness to technology and a perception that technology will bring overall benefits, is correlated with greater Internet service usage in everyday life and work (Dutton and Blank, 2015).

Most studies include sociodemographic characteristics either as independent variables (Li, Glass and Records, 2008; Laukkanen, 2016; Rayle *et al.*, 2016) or as control variables. Age, gender, education, and income level moderate the relations between technological, social, and attitudinal factors to adoption or intention to use (Alemi *et al.*, 2018; Acheampong *et al.*, 2020; Elnadi and Gheith, 2022). In addition, broader contextual factors are important considerations. For example, people without access to a car are more likely to adopt ride-hailing (Acheampong *et al.*, 2020; Blumenberg, Paul and Pierce, 2021; Irawan *et al.*, 2021) or online shopping (Shi *et al.*, 2021; Shah and Carrel, 2024). Urban dwellers are also more likely than those living in suburbs to use ride-hailing (Mitra, Bae and Ritchie, 2019; Acheampong *et al.*, 2020) or food delivery (Wang and He, 2021), as household area determines service availability.

2.3. Time and Technology

Noticeably absent from the literature on digital service adoption is people's perceptions of time, despite on-demand digital services' value proposition of immediacy and assumption of time-sensitive customers (Taylor, 2018). Literature from the sociology of time can bridge this gap, using concepts of pace of life, time scarcity, and willingness to wait to explain time sensitivity.

The acceleration of the pace of life in modern society and the role of technology in the acceleration are still subject to debate (Tomlinson, 2007; Wajcman, 2008; Rosa, 2013; Vostal, 2014; Southerton, 2020). Pace of life has been defined as the rate or relative rapidity or density of experiences and activities (Levine and Norenzayan, 1999) which can be observed through four acceleration mechanisms: a speeding up of the pace at which activities are performed, an increase in multitasking, a reduction in breaks and downtime between activities, and a substitution of time-consuming activities by time-saving activities (Rosa, 2013, pp. 128–129). Bergener & Santarius (2021) developed and validated a General Acceleration Scale to empirically measure the pace of life. They found that greater use of Information and Communication Technologies (ICT) is correlated with higher scores in the General Acceleration Scale, which indicates a faster pace of life (Santarius and Bergener, 2020). ICT use may accelerate the pace of life, but people with higher pace of life may also be prone to a high degree of ICT usage, suggesting interlinkages and a feedback loop rather than a clear causal direction (Wajcman, 2015). In contrast, a time-use study in the UK found little evidence for any generalised speed-up in tempo of daily activities between 2000 and 2015 and no evidence of the association between greater ICT use and feeling rushed after controlling for socioeconomic class and occupational status (Sullivan and Gershuny, 2018). The contrasting findings invite further research including on the role of on-demand services as both driver and outcome of changing perceptions of time.

While the pace of life examines the acceleration of activities, time scarcity refers to the feeling of not having enough time to do various activities. A growing number of people have reported feeling time pressure (Rudd, 2019), particularly among women and the professional/managerial class (Sullivan and Gershuny, 2018). Time scarcity has been linked to increased use of time-saving services (Kaufman-Scarborough and Lindquist, 2003), as people who are pressed for time find time-saving technologies more appealing (Southerton and Tomlinson, 2005). For example, people with more time pressure have more favourable attitudes towards online shopping than offline shopping (Xu-Priour, Cliquet and Fu, 2012). Households with children are more likely to be motivated by time-savings to adopt any home delivery because they are more time constrained compared with childless households (Spurlock et al., 2020), although the study did not focus on on-demand services. Time shortage also influences people’s food choices, with higher time scarcity linked with people eating more take-outs (Jabs and Devine, 2006) and using online food delivery (Ma *et al.*, 2024).

Finally, time sensitivity can be expressed by consumers’ expectations of the speed of the service itself. Consumers of on-demand digital services are assumed to be sensitive to waiting time (Taylor, 2018; Bai *et al.*, 2019). Wait time refers to the time between when the consumers place an order and when they receive the product or service. Empirical studies have shown that on-demand consumers are time-sensitive by showing that longer waiting times can lead to more cancellations of online food delivery orders (Xu, Yan and Tong, 2021). For online shopping, a market research survey in 2024 found that almost a quarter of consumers prioritise speed of delivery over cost, convenience, or delivery tracking and more than half expect delivery to arrive within 48 hours, a 5% increase in demand for speedier delivery than the previous year (Metapack, 2024). Shorter wait time is also cited as one of the top reasons consumers use ride-hailing applications (Rayle *et al.*, 2016; Fu, 2020; Tirachini, 2020). Other studies have also examined changes in customers’ willingness to wait in response to various delivery attributes such as cost, sustainability information, flexibility, or tracking (Buldeo Rai, Verlinde and Macharis, 2019; Dietl, Voigt and Kuhn, 2024; Oyama *et al.*, 2024). At the same time, this preference may also develop from consumers' experience of being exposed to or directly using the services (Wajcman, 2015, p. 45). People's time preference and usage of digital services are therefore interlinked.c

3. Analytical framework

We developed a conceptual framework that captures the factors identified in prior literature on innovation adoption relevant to our interest in perceptions of time and on-demand services (Figure 1). The conceptual framework draws upon Diffusion of Innovation (DOI), a widely used analytical framework on the process by which an innovation is communicated through certain channels over time among members within a social system (Rogers, 2003). While DOI is primarily focused on the diffusion of an innovation across society, it also proposes an innovation-adoption decision process that explains how an individual or a decision-making unit decides to adopt an innovation (Rogers, 2003, p. 166). The innovation-adoption process accounts for prior conditions such as felt needs or problems, norms of the social system, characteristics of the decision maker, and innovation attributes. Hence, DOI aptly captures the range of factors that explain the adoption of on-demand digital services of interest to this research.

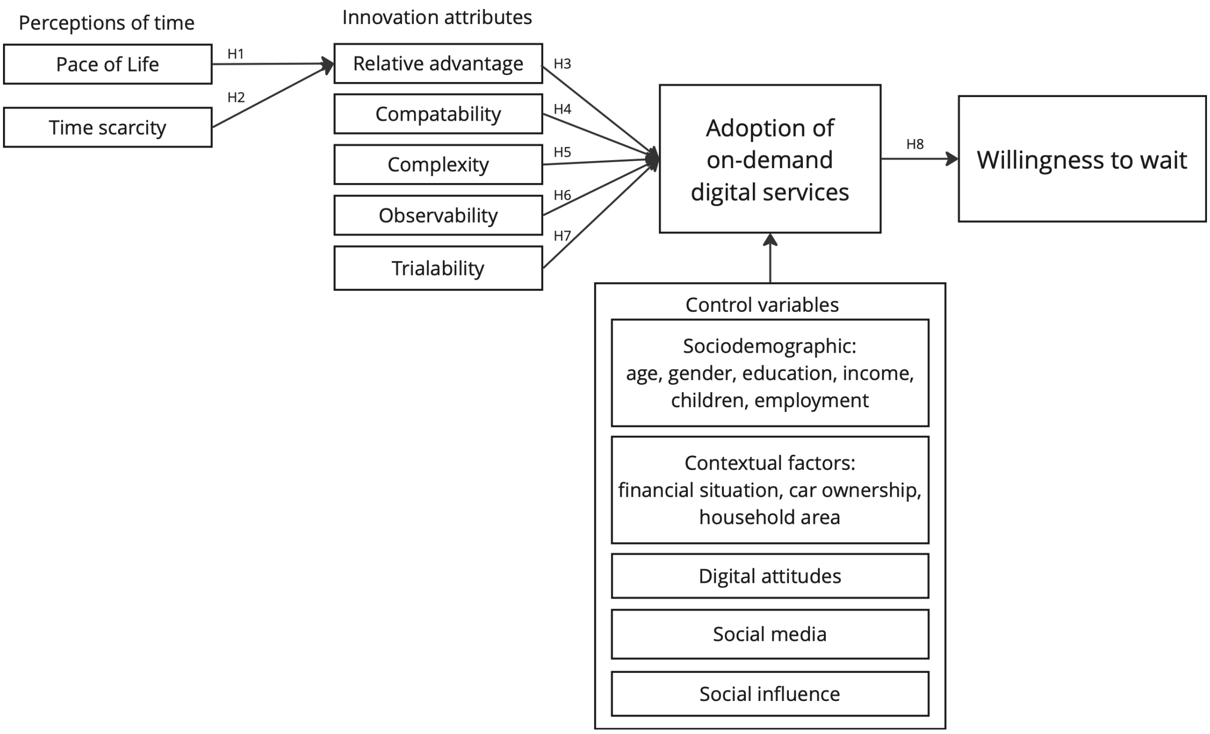

Figure 1. Analytical framework including hypotheses (Hs)

3.1. Perceptions of time

People's perceptions of time are linked to their technology use and consumption patterns, potentially through perceived pace of life or perceived time scarcity. As on-demand digital services explicitly promote speed and appeal to people's sense of urgency, we hypothesised that:

H_1: The pace of life is positively associated with the perceived relative advantage of on-demand digital services.
H_2: Perceived time scarcity is positively associated with the perceived relative advantage of on-demand digital services.

3.2. Innovation attributes

An individual's perception of innovation attributes is strongly correlated with adoption. People are more likely to adopt an innovation that they perceive to have a greater relative advantage than the previous option, high compatibility, and low complexity. Trialability and observability are also occasionally influential. Hence, we propose the following:
H_3: Perceived relative advantage is positively correlated with the adoption of on-demand digital services.
H_4: Compatibility is positively correlated with the adoption of on-demand digital services.
H_5: Complexity is negatively correlated with the adoption of on-demand digital services.
H_6: Observability is positively correlated with the adoption of on-demand digital services.
H_7: Trialability is positively correlated with the adoption of on-demand digital services.

3.3. Willingness to wait

On-demand digital services cater to time-sensitive customers who are sensitive to delays. Hence, we expect a difference between adopters and non-adopters of on-demand digital services in their willingness to wait for the product or service to be delivered since an order is placed. We posit:
H_8: Users of on-demand digital services have lower willingness to wait than non-users.

4. Methodology

This study employs a quantitative, cross-sectional survey design to compare adopters and non-adopters of three digital innovations: food delivery, ride-hailing, and next-day delivery retail. Participants are categorised into six distinct groups based on their adoption status of the innovations (i.e., adopters and non-adopters of food delivery, ride-hailing, and next-day retail). The design allowed for identifying key differences in perceptions of time and perceptions of innovation attributes between the two groups for the three innovations while controlling for sociodemographic and contextual factors (shown in Figure 1).

4.1. Survey Design

The survey questionnaire was divided into four sections (Figure 2). In the first section, we asked all participants to take the General Acceleration Scale from Bergener and Santarius (2021), the Time Scarcity Scale from Kaufman-Scarborough and Lindquist (2003), and the digital attitudes questionnaire from the Oxford Internet Survey (Blank, 2019). For each indicator, a 5-point Likert scale was used, with 1 indicating "strongly disagree" and 5 indicating "strongly agree."

Then, in the second section, we asked about their on-demand digital services usage and social media use, including types and frequency of use. We also asked them to rate within a 5-point Likert scale how important various on-demand digital services are to them and people important to them (social influence). Lastly, we asked how long they were willing to wait for delivery for each of the services.

Based on their on-demand digital services usage, participants were filtered into a group and assigned the relevant section (i.e., adopters or non-adopters for each innovation) to meet a quota of 250 participants per group. This third section included an open-ended question on the reasons for or against adopting the on-demand digital service they were assigned. Then, we asked them to rate the attributes of the innovation. The measures for innovation attributes were taken from Min et al. (2019) and Shaw et al. (2022) with 5-point Likert scale answers. As these measures referred to a specific innovation, the wording was tailored to the on-demand service directly and adjusted to fit people's adoption status, presented in hypothetical terms for non-adopters. Lastly, we asked participants about their intention to use the innovation in the future.

In the final section, we asked all participants about demographic characteristics and contextual factors, such as gender, education, employment status, number of kids, car ownership, household area, household income, and subjective financial situation.

We pretested the survey questionnaire for clarity. We built the survey in Qualtrics' survey platform and piloted to 50 participants through Qualtrics' panel. We examined the descriptive statistics of the pilot responses, tested the scales' reliability, and made minor adjustments to the wording to enhance clarity and ease of response (see Appendix for the final measurement items).

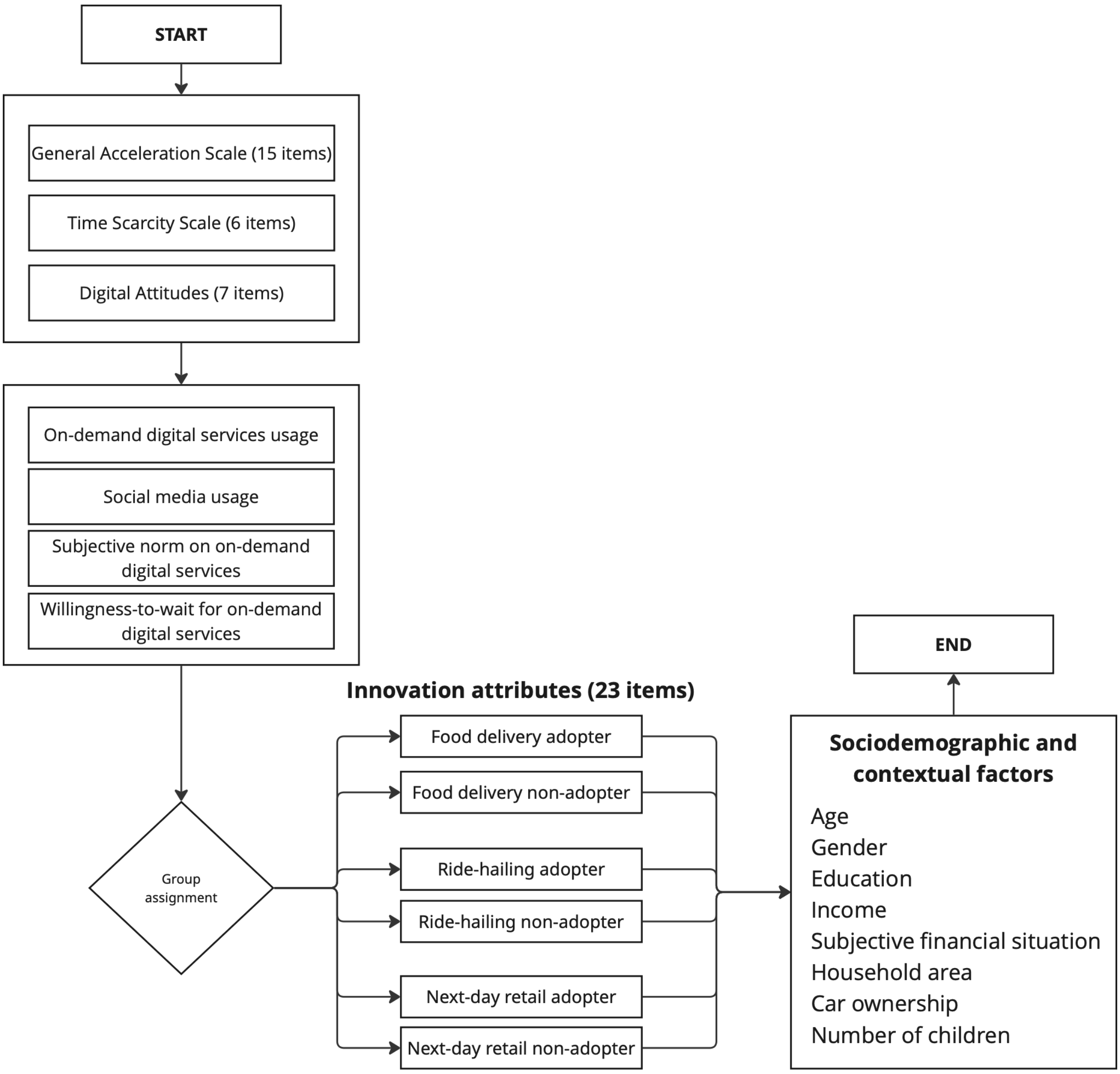

Figure 2. Survey design

4.2. Data Collection

We used Qualtrics to administer the online survey to their panel between June and July 2024. The inclusion criteria were: participants had to be 18 years or older and living in the United Kingdom. We used quota sampling to reach a minimum of 250 adopters and 250 non-adopters for each on-demand digital service. Qualtrics' survey tool automatically rejected participants who did not pass quality checks, including speed checks, straight line checks, and attention checks. A total of 1,604 participants completed the survey, 92 of which were removed due to missing responses and poor-quality answers (i.e., nonsensical text in the open questions). The final sample was 1,512 responses, with 252 participants for each group. Table 2 provides the demographic breakdown of the participants.

The participants were disproportionately female and higher income relative to the general population. This reflects the quota sampling strategy which prioritised targeting based on adoption profiles rather than population-level representativeness. The skew may also be influenced by self-selection bias in the data collection process (Lehdonvirta *et al.*, 2021) and the possibility that women and higher-income people are more likely to be interested in the survey topic. As the aim of the study is to explore perceptions of time and adoption dynamics within relevant consumer segments rather than to make general inferences about population behaviour, the sample is appropriate for addressing the research questions.

Table 2. Demographic characteristics of participants

Demographic profile	Sample statistics (N=1,512)	Adult UK population statistics (Census 2021)
Gender		
Female	70.6%	51%
Male	29%	49%
Age		
18-24	8.7%	10.5%
25-34	21.4%	17.1%
35-44	22%	16.4%
45-54	17.9%	16.8%
55-64	15.6%	15.9%
65 or older	14.4%	23.3%
Education		
Below upper secondary	23.2%	17.8%
Post-secondary, non-tertiary	24.6%	29.5%
Tertiary education	52.2%	52.7%
Income		
Up to £19,999	19.8%	24.9%
£20,000-29,999	20.3%	28.9%
£30,000-39,999	14.3%	17.5%
£40,000-49,999	13.4%	10.7%
£50,000-59,999	9.4%	9.5%
£60,000 and above	22.9%	8.5%

4.3. Data Analysis

The data was analysed with SPSS (version 29.0.2.0). First, we conducted reliability testing on the General Acceleration Scale (15 items), Time Scarcity Scale (6 items), and Digital Attitudes Scale (7 items). The General Acceleration Scale (Cronbach's Alpha= .91) and the Time Scarcity Scale (Cronbach's Alpha= .89) both had a high level of internal consistency. The scores were summed, following Bergener & Santarius (2021) and Kaufman-Scarborough & Lindquist (2003), to obtain a pace of life score and time scarcity score, respectively. The Digital Attitudes Scale, on the other hand, had low Cronbach's Alpha (.63), but the three positively-worded items had adequate Cronbach's Alpha (.74). Hence, only the three items were retained, and a factor score was created using confirmatory factor analysis to represent a positive attitude to technology. The reliability testing results are available in the Appendix.

We also conducted reliability testing on each of the innovation attributes questions. We then used confirmatory factor analysis to extract a factor score for each innovation attribute. This factor scoring is based on the method discussed in DiStefano et al. (2009). The results confirm the measures load to a component for the following constructs: relative advantage (overall KMO measure: .93, individual KMO measures all greater than .90, explaining 66.25% of the total variance), compatibility (overall KMO measure: .76, individual KMO measures all greater than .7, explaining 85.04% of variance), complexity (overall KMO measure was .56, individual KMO measures all greater than .50, explaining 55.55% of variance), observability (overall KMO measure was .77, individual KMO measures all greater than .60, explaining 55.19% of variance), and trialability (overall KMO measure: .79, individual KMO measures all greater than .70, explaining 62.20% of variance). Bartlett's test of sphericity for all component analysis was statistically significant ($p<.001$), which indicates they are appropriate for factor analysis. Although the complexity construct had lower KMO values relative to others, Bartlett's test indicated sufficient correlation structure for inclusion.

We conducted hypothesis testing using several methods appropriate to the objective and the data. The relationships between the pace of life (H_1), time scarcity (H_2), and the relative advantage scores were tested using a linear regression method. We checked for multicollinearity and found no issues (VIF results in Appendix). Further, we analysed the open-ended responses on reasons for or against adoption of an innovation by coding them to a relevant category. The coding process was inductive and iterative as new categories were added throughout the process. We examined whether the responses include sentiments around time and speed.

A binomial logistic regression was conducted to test H_3-H_7. Forward conditional stepwise selection of variables was used, with each model incorporating an additional block: 1) socio-demographics and contextual factors, 2) digital attitudes, 3) social factors, and 4) innovation attributes. A Box-Tidwell procedure confirmed the assumption of linearity of the continuous independent variables (i.e., number of social media and innovation attributes score) concerning the logit of the dependent variable of adoption status.

The difference in willingness to wait between adopters and non-adopters of on-demand digital services (H_8) was tested using the Mann-Whitney U test, a non-parametric test suitable for the ordinal nature of the dependent variable. We used descriptive statistics to test whether the two groups have a similar distributional shape to meet the assumption of the Mann-Whitney U test.

5. Results

5.1. Perceptions of time

The regression results for the correlation between pace of life, time scarcity, and relative advantage are presented in Table 3.

Table 3. Linear regression model results explaining perceived relative advantage of on-demand digital services

	Dependent variable = Relative advantage								
	Ride-hailing			**Food delivery**			**Retail**		
Variables	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Constant	-.428	.341		-.292	.326		-.767	.310	
Pace of life	.026	.004	.269***	.013	.004	.138**	.012	.004	.128**
Time scarcity	-.009	.008	-.044	.017	.008	.093*	.036	.008	.208***
Gender	-.037	.085	-.018	-.113	.088	-.050	.007	.084	.004
Employment	.144	.086	.070	.186	.090	.086	.051	.087	.026
Age	-.146	.027	-.238***	-.224	.028	-.362*	-.124	.026	-.219***
Number of children	.163	.045	.149***	.079	.050	.062***	.123	.055	.096*
Model summary	R^2 = .238, p <.001			R^2 = .297, p <.001			R^2 = .199, p <.001		

Note: *p < .05; **p < .01; ***p < .001

Pace of life was positively related to a higher relative advantage score in all three on-demand digital services, even when controlling for possible related factors identified by Southerton & Tomlinson (2005), such as gender, age, employment, or having children. This finding confirms H_1 that people with a higher pace of life were more likely to perceive greater relative advantage of on-demand digital services. The effect size of pace of life to relative advantage is greatest in ride-hailing.

Time scarcity was significantly related to higher relative advantage only in retail and online food delivery, but not in ride-hailing. This finding supports H_2 that people experiencing time shortage were more likely to perceive greater relative advantage from next-day delivery retail and online food delivery.

The qualitative responses also revealed the importance of speed and time-saving as the primary reasons for adopting next-day retail and online food delivery but less so for ride-hailing. Quick, fast, and time-saving were mentioned by 77% of next-day delivery adopters, 48% of online food delivery adopters, and 39% of ride-hailing adopters, by far the top reasons in the respondents' own words (Figure 2). Ride-hailing adopters also mentioned a broad range of reasons such as ease of payment, convenience, reliability, ability to track the ride, no access to other travel options, or having had alcoholic drinks.

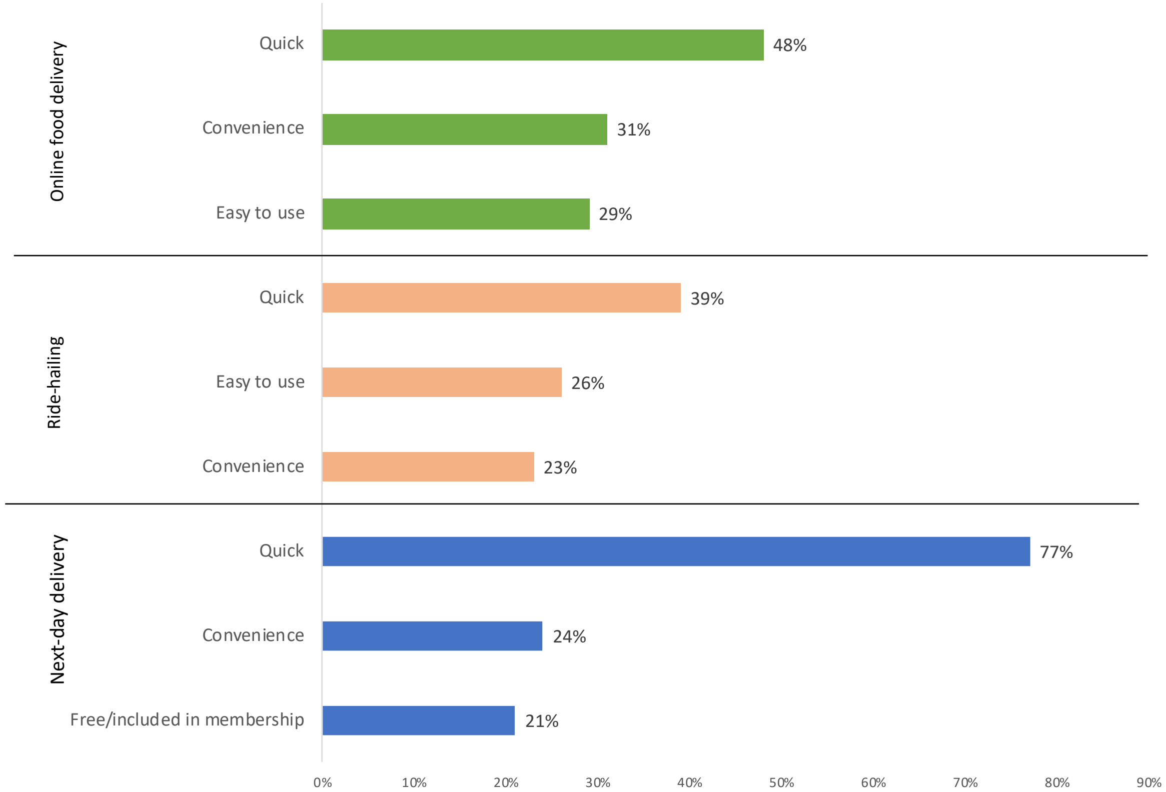

Figure 3. Top three reasons for using the following on-demand digital services

5.2. Binomial Logistic Regression Model Explaining On-Demand Services Adoption

The binomial logistic regression model analysed innovation attributes based on DOI, while controlling for sociodemographic, contextual factors, digital attitudes, and social factors based on our conceptual framework to predict the adoption of ride-hailing, online food delivery, and next-day retail to test H_3-H_7.

Model 1 included only sociodemographic and contextual factors based on the literature review. Some of the sociodemographic and contextual factors had a significant impact on people's likelihood to adopt, particularly age. Model 2 added digital attitudes to only the significant variables from Model 1. This addition resulted in a slight model improvement for ride-hailing, but not for online food delivery and next-day retail, indicating that general positive attitude to technology is not a universally significant predictor across the types of on-demand digital services. Model 3 then captured social influence factors, including social media use and subjective norm, which improved the model fit across the three innovations, confirming that social factors are strongly related to the likelihood of adoption. Lastly, Model 4 introduced the individual's perception of innovation attributes, which greatly improved how well the model predicts people's adoption of an innovation. The full stepwise procedure is available in the appendix, while the final results of Model 4 for all on-demand services is in Table 4. This final model is robust to differences in the ordering of variable blocks in the stepwise procedure (e.g., introducing independent variables before sociodemographic controls).

The final model was statistically significant for all three on-demand digital services. For ride-hailing, the model results were $\chi^2(10) = 332.273$, $p < .001$, and it explained 64.6% (Nagelkerke R^2) of the variance in adoption. For online food delivery, the model results were

$\chi^2(10) = 292.870$, $p < .001$, accounting for 59.1% (Nagelkerke R^2) of the variance in adoption. For next-day retail, the model results were $\chi^2(8) = 240.116$, $p < .001$, explaining 50.8% (Nagelkerke R^2) of the variance. The final model was able to correctly classify 82.7% of cases in ride-hailing, 81.0% in food delivery, and 78.7% in next-day delivery retail.

Table 4. Binary logistic regression model results for adoption of on-demand services

	Ride-hailing		Online food delivery		Next-day retail	
Variables	**B (SE)**	**Exp(B)**	**B (SE)**	**Exp(B)**	**B (SE)**	**Exp(B)**
Sociodemographic						
Gender (male)						
Age (45 and over)	-0.531 (0.291)	0.588	-0.631 (-0.289)	0.532		
Education (bachelor)						
Income (medium-high)						
Children (has kids)						
Employment (employed)			0.3 (0.29)	1.35	0.247 (0.251)	1.28
Contextual factors						
Financial situation (OK)	0.535 (0.273)	1.708*			-0.178 (0.241)	0.837
Car (owns car)						
Household Area (countryside)	-0.955 (0.461)	0.385*	-0.978 (0.419)	0.376*		
Digital attitudes						
Openness to tech						
Social media						
Number of social media	0.164 (0.078)	1.179*	0.256 (0.081)	1.291**	0.099 (0.065)	1.104
Hours of social media						
Social norm						
Subjective norm	0.467 (0.127)	1.595***	0.143 (0.125)	1.153	0.180 (0.121)	1.197
Innovation attributes						
Relative advantage	0.798 (0.255)	2.220**	0.689 (0.225)	1.992**	0.905 (0.225)	2.472***
Compatibility	1.212 (0.269)	3.361***	0.825 (0.228)	2.282***	1.695 (0.274)	5.449***
Complexity	-0.310 (0.139)	0.733*	-0.606 (0.148)	0.546***	-0.467 (0.129)	0.628***
Observability	0.595 (0.193)	1.813**	0.047 (0.198)	1.048	-0.253 (0.218)	0.776
Trialability	-0.503 (0.229)	0.605*	0.347 (0.2)	1.414	-0.749 (0.218)	0.474***
Constant	-2.351 (0.590)	0.095***	-1.002 (0.576)	0.367	-1.282 (0.479)	0.277
Model fit	χ^2 = 332.273, R^2 = .646, p <.001		χ^2 = 292.870, R^2 = .591, p <.001		χ^2 = 240.116, R^2 = .508, p <.001	

Note: *p < .05, **p < .01, *** p < .001. Model fit statistics are for the final integrated model. We use the Nagelkerke R^2.

Results on the innovation attributes were mixed. Compatibility (H_4) had the strongest positive effect on all three on-demand digital services. Greater perceived compatibility was associated with a more than threefold increase in the odds of adopting ride-hailing services (Exp(B)= 3.36, $p < .001$), more than doubling the odds of using online food delivery (Exp(B)=

2.28, *p* < .001), and increasing the likelihood of adopting next-day retail delivery by over five times (Exp(B)= 5.45, *p* < .001). Compatibility was followed by relative advantage (H_3), which had a strong and positive influence on the adoption of all three on-demand digital services. The odds ratio suggested perceived relative advantage doubles the likelihood of adopting all three services. Meanwhile, complexity (H_5) was negatively correlated with adoption as expected for ride-hailing (p<0.05), online food delivery (p<.001), and next-day retail (p<.001). Observability (H_6) was only statistically significant for ride-hailing, but not for online food delivery or next-day retail. Counter to expectation, trialability (H_7) was negatively correlated for next-day retail (p<.001) as well as ride-hailing (p<0.05). Further testing indicates that the direction of the relationship was affected by its interaction with compatibility where trialability had a positive relation to adoption when tested in isolation, but changed to a negative effect after compatibility was introduced, indicating collinearity between attributes.

5.3. Willingness to wait

Lastly, we tested whether the adoption of on-demand digital services was correlated with differences in willingness to wait (H_8). In other words, people who have used on-demand digital services might be more sensitive to delays. We found a significant difference in willingness to wait (p <.001) between adopters and non-adopters for all on-demand digital services. Adopters of ride-hailing had a lower mean rank (616.90) compared to nonadopters (742.21). Similarly, people who used next-day delivery retail also had shorter willingness to wait (mean rank=674.34) for their online shopping order to be delivered than non-adopters (mean rank=829). However, counterintuitively, people who never used online food delivery expressed shorter willingness to wait for a food delivery (mean rank=634.13) compared to those who have used the service (mean rank=778.31) (Table 5).

Table 5. Mann-Whitney U Test results for differences in willingness to wait

On-demand digital service	Non-adopter n	Non-adopter Mean rank score	Adopter n	Adopter Mean rank score	U	z	r	p
Ride-hailing	750	742.21	620	616.90	189966	-6.182	-0.167	<.001
Online food delivery	632	634.13	796	778.31	302332	6.735	0.178	<.001
Retail	520	829.00	938	674.34	192142	-7.110	-0.186	<.001

Note: The sample is taken from the second section of the survey before everyone was assigned into a group. We compared all participants who have used the service to those who have not.

Table 6 summarises the hypothesis testing results for each of the on-demand services.

Table 6. Summary of analyses for perceptions of time and usage of on-demand digital services

Hypothesis	Ride-hailing	Online food delivery	Next-day retail
H_1: The pace of life is positively associated with the perceived relative advantage of on-demand digital services.	Confirmed	Confirmed	Confirmed
H_2: Perceived time scarcity is positively associated with the perceived relative advantage of on-demand digital services.	Rejected	Confirmed	Confirmed
H_3: Perceived relative advantage is positively correlated with the adoption of on-demand digital services.	Confirmed	Confirmed	Confirmed

H_4: Compatibility is positively correlated with the adoption of on-demand digital services.	Confirmed	Confirmed	Confirmed
H_5: Complexity is negatively correlated with the adoption of on-demand digital services.	Confirmed	Confirmed	Confirmed
H_6: Observability is positively correlated with the adoption of on-demand digital services.	Confirmed	Rejected	Rejected
H_7: Trialability is positively correlated with the adoption of on-demand digital services.	Rejected	Rejected	Rejected
H_8: Users of on-demand digital services have lower willingness to wait than non-users.	Confirmed	Rejected	Confirmed

6. Discussion

Our study builds upon previous literature on innovation adoption to understand whether people's perceptions of time affect how they perceive and use on-demand digital services that promise speed and convenience.

6.1. Perceptions of time and on-demand services

The findings demonstrate a link between people's perceptions of time and their use of on-demand services. We find that people with a higher pace of life were more likely to perceive online food delivery, ride-hailing, and next-day retail as more advantageous relative to alternative services. However, for time scarcity we only found association with relative advantage of online food delivery and next-day retail, but not ride-hailing. This suggests on-demand digital services appeal to an impatient, time-sensitive customer base (Bai *et al.*, 2019), but in different ways. The difference in associations shed light on the nuances of perceptions of time. While pace of life and time scarcity are closely related, they represent varied dimensions of how people experience time. As Southerton (2003) argued based on his qualitative interviews, being harried is distinct from being time scarce. Our findings add empirical evidence to support this argument and further show that people respond differently to pace of life and time scarcity through their service use.

Pace of life describes the tempo and rhythm of activities (Levine and Norenzayan, 1999; Rosa, 2013; Bergener and Santarius, 2021). For people with a fast pace of life, on-demand services not only allow for a faster experience, it allows for density of activity and filling of down time (e.g., doing something else while in a ride-hailing car or waiting for food delivery) as well as flexibility (e.g., ordering ride-hailing or online shopping late at night) which fits with the intensity of a higher pace of life. This echoes previous research that finds degrees of digitalisation are positively correlated with pace of life (Santarius and Bergener, 2020).

Meanwhile, the feeling of time scarcity more precisely reflects subjective time constraints that encourages consumers towards options and actions that help save time (Hornik and Zakay, 1996). People with time pressure have more favourable attitudes towards online shopping (Xu-Priour, Cliquet and Fu, 2012), any home delivery (Spurlock *et al.*, 2020), or online food delivery (Ma *et al.*, 2024) as they significantly save time relative to the alternative services. However, the time-saving aspect of ride-hailing is not straightforward. Ride-hailing generally has shorter and more consistent wait times than regular taxi or public transportation (Rayle *et al.*, 2016), but it increases overall travel time compared to driving (Asgari and Jin, 2020). Further, people's perception of ride-hailing's advantage seems to vary greatly depending on their level of trust in strangers, mode-dependency, or perceived benefits of private vehicle ownership (Asgari and Jin, 2020). Hence, time saving is not the predominant indicator of how people perceive ride-hailing, with other factors potentially being a larger contribution to people's perception of relative advantage, such as privacy, safety, reliability, comfort, and affordability (Acheampong *et al.*, 2020; Tirachini, 2020; Elnadi and Gheith, 2022).

Perceived relative advantage strongly predicts people's likelihood of adopting the innovation, along with compatibility and complexity. These findings aligned with previous studies (Tornatzky and Klein, 1982; Schepers and Wetzels, 2007; Kapoor, Dwivedi and Williams, 2014; Kim, Park and Lee, 2019; Min, So and Jeong, 2019; Belanche, Flavián and Pérez-Rueda, 2020). In response to the debate on the significance of observability (Min, So and Jeong, 2019; Elnadi and Gheith, 2022), our finding suggests the attribute's importance depends very much on the sector. It might be significant for ride-hailing as observations may assuage an individual's concerns around privacy and trust in strangers (Asgari and Jin, 2020; Scholl, Oviedo and Sabogal-Cardona, 2021), while online food delivery and next-day retail are already considered low risk.

Trialability is another interesting result. Contrary to expectations, it had a statistically significant negative effect on the adoption of ride-hailing and next-day retail. This counterintuitive result demonstrates the complex interaction between the innovation attributes themselves (Flight, D'Souza and Allaway, 2011). If an innovation is already seen as compatible and advantageous, trialability might be less important or might even have an opposite effect.

6.2. Willingness to wait

While perceptions of time are important considerations for adoption, the use of on-demand digital services also correlates with people's waiting time preferences. The study finds that adopters of ride-hailing and next-day retail have shorter willingness to wait for a ride or a delivery compared to non-adopters. The finding resonates with surveys that show people increasingly expect shorter delivery time from online shopping (Joerss *et al.*, 2016; Metapack, 2024), although the preference0 may vary according to the category and price of the purchase (Oyama *et al.*, 2024). Yet, it is difficult to untangle whether people have shorter willingness to wait due to their experience of using on-demand digital services, or people use on-demand digital services because they are more impatient.

Interestingly, for online food delivery, non-adopters have shorter willingness to wait than adopters. One possible explanation is that even though food delivery companies advertise fast delivery, actual delivery times may vary widely (Pourrahmani, Jaller and Fitch-Polse, 2023). Non-adopters may make assumptions based on advertisement, while adopters may learn from prior experience and temper their expectations. Consumers' sensitivities to waiting for online food delivery are still relevant, as longer waiting time leads to higher cancellation rates (Xu et al., 2021). But our findings suggest a possible recalibration of expectations from experience.

The shortening of customers' willingness to wait feeds into the assumption of the time-sensitive customers. This expectation is not merely a reflection of consumer need but may be shaped—and intensified—by repeated exposure to on-demand services themselves, suggesting that on-demand digital services may drive the acceleration cycle. As people experience faster pace of life and time scarcity, they perceive greater advantage of on-demand services and so are more likely to use them. This in turn reinforces the fast pace of life as the services set new norms of delivery speed. The cycle may be another evidence of the time paradox in which innovations that are supposed to ease time pressure conversely intensify activities which leads to time compression and the feeling of busyness. Rather than simply saving time or easing time pressure, innovations intended for speed, change the nature and meaning of activities and create new practices around time use (Southerton, 2003; Wajcman, 2008). In the case of on-demand services, the innovations are setting higher expectations of delivery speed and potentially new consumption practices.

6.3. Implications

The environmental implications of people's expectations of on-demand digital services are considerable, as discussed briefly in the introduction. Faster delivery for retail or food often prevents logistical consolidation, increases vehicle miles travelled, and relies on carbon-intensive last-mile solutions (Allen, Piecyk and Piotrowska, 2018). Ride-hailing also cannibalises public transportation, increases carbon emissions from driving without passengers, and adds to congestion and pollution (Tirachini, 2020).

Efforts to reduce the environmental impacts of on-demand services thus far has been to reduce carbon emissions mostly through electrifying ride-hailing or delivery vehicles and increasing efficiency of routing, without addressing the underlying expectations for fast delivery itself. Our findings add a more nuanced understanding of the customers' perceptions of time and expectations that can inform how on-demand services are designed. Beyond technical solutions to reduce the carbon footprint of logistic operations, on-demand service providers should consider managing customers' expectations and balance the speed of delivery with other features that might fit with customers' varied preferences and perceptions of time.

On-demand services can manage customer expectations in several ways. On-demand service companies can improve their customer segmentation to understand multidimensional preferences, whether for speed or flexibility, that respond to time scarcity or pace of life. Subsequently, on-demand service companies can reframe their value propositions from offering speed to offering flexibility, reliability, certainty, efficiency, or sustainability. Zhong et al. (2022) argued that delivery reliability is more significant than delivery speed for customers' adoption of express delivery service. Further, when environmental costs are transparently presented to customers, many are willing to wait longer (Buldeo Rai, Verlinde and Macharis, 2019; Dietl, Voigt and Kuhn, 2024) or switch to collection (Savall-Mañó, Hook and Abouelela, 2025). These studies highlight potential levers for sustainability through nudging consumers toward greener choices, such as by defaulting to slower, lower-emission delivery options or providing emissions information, without sacrificing consumer interest.

6.4. Limitations and future research

While the study has contributed insights into people's perceptions of time and innovation adoption, it is not without limitations. This study's cross-sectional nature does not allow for causal inferences between people's perceptions of time, innovation adoption, or willingness to wait. The results can only confirm the associations between the variables.

Furthermore, we were unable to test the recursive relationships between perceptions of time and use of on-demand services. While people with high time scarcity and fast pace of life are more likely to adopt these services, regular use of such services may in turn accelerate pace of life and reduce tolerance for waiting. As on-demand platforms continue to shape consumption norms, future research should focus on identifying the feedback loop between the use of these services and users' subjective perceptions of time. Longitudinal studies or experimental interventions, such as altering delivery defaults or introducing waiting incentives, could better establish causal direction and identify potential feedback loop.

Understanding this bidirectional relationship will be essential to designing services that are not only efficient, but also environmentally sustainable.

Future research can also elaborate on the trade-off between speed of delivery and other on-demand service features. Research design like a vignette or choice model can explore people's preferences between speed, reliability, sustainability, and other service attributes. This exploration can provide practical insights for on-demand services to tailor their value proposition.

7. Conclusion

On-demand digital services have proliferated in recent years across sectors, particularly in mobility, retail, and food. The services set new standards for speed and immediacy by reducing the wait time between order and delivery. This study identifies links between perceptions of time and the perceived relative advantage of on-demand digital services, which influence adoption decisions. We find that people with a faster pace of life rate the relative advantages of the on-demand digital services higher. Those experiencing time scarcity also perceive a greater relative advantage for online food delivery and next-day retail. These findings suggest that on-demand digital services appeal to time-sensitive consumers who value speed and convenience, and allude to the multiple dimensions of time perceptions such as feeling "hurried" or feeling short of time associated with on-demand services use.

Perceived relative advantage, compatibility, and complexity of the services are strong predictors of adoption. Meanwhile, observability is only significant for ride-hailing. Trialability had a significant negative effect on ride-hailing and next-day retail, contradicting expectations. Further testing shows that the counterintuitive direction of effect is a result of the interaction between trialability and compatibility. This insight highlights how the innovation attributes identified in the diffusion of innovation theory are not mutually exclusive and distinct, but rather empirically interrelated.

Lastly, our study shows statistically significant difference in how long adopters and non-adopters of on-demand digital services are willing to wait. Adopters of ride-hailing and next-day retail have shorter willingness to wait for their orders to be fulfilled. Curiously, people who never use on-demand food delivery had shorter expectations of delivery time compared to users. Users' preferences for fast delivery have major implications for the environmental sustainability of on-demand digital services, as faster delivery generally have greater carbon emissions than normal delivery. To promote sustainability, digital platforms must manage customer expectations and balance speed with environmental impact.

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Appendix A. Sample measurement items for ride-hailing adopters

Construct	Items	Source
Pace of life	1. I do several things at a time 2. I perform more than one activity 3. I multitask 4. I handle several tasks simultaneously 5. I decide to do time-saving activities rather than time-consuming activities 6. I replace time-intensive tasks to save time 7. I try to replace time-consuming activities with other activities that save time 8. I do things very quickly 9. I perform activities quickly 10. I bring things to an end as quickly as possible 11. I get things done as fast as possible 12. I use waiting times for other activities 13. I use downtime and breaks for additional activities 14. I try to fill breaks with as productive occupations as possible 15. I make use of transfer times to get things done	Bergener & Santarius, 2021
Time scarcity	1. I have to do things which I don't really have the time and energy for 2. There are too many demands on my time 3. I need more hours in the day to do all the things which are expected of me 4. I can't ever seem to get caught up 5. I don't ever seem to have any time for myself 6. Sometimes I feel as if there are not enough hours in the day	Kaufman-Scarborough & Lindquist, 2003
Digital attitudes	1. When new digital technologies or gadgets are invented, it is a good idea to try them 2. Technology is making things better for people like me 3. People should be concerned about protection of credit card details when they use new technologies 4. The use of computers and the Internet is a threat to personal privacy	Blank, 2019

	5. I find it difficult to keep up to date with new technology	
	6. Companies that store and sell my personal data are a threat to my privacy	
	7. Artificial Intelligence will bring overall positive benefits for society	
Relative Advantage	1. They improve the quality of requesting transportation (RAQuality)	Min, So, & Jeong 2018
	2. They give me greater control over my travel (RAControl)	
	3. They make it more convenient to travel (RAConv)	
	4. They enable me to make a payment more conveniently (RAPay)	
	5. They enhance my overall transportation experience (RAOverall)	
	6. They enable me to get transportation more quickly (RASpeed)	Moore & Benbasat, 1991
	7. Using them saves me time (RATime)	
	8. Using them is cheaper (RACost)	
Compatibility	1. They fit well with the way I like to travel (Compat1)	Min, So, & Jeong 2018
	2. They are compatible with my lifestyle (Compat2)	
	3. They fit with my service needs (Compat3)	
Complexity	1. They require technical skills (Complex1)	Min, So, & Jeong 2018
	2. They require a lot of mental effort (Complex2)	
	3. They can be frustrating (Complex3)	
Observability	1. I can immediately see the benefits of using them (Obs1)	Moore & Benbasat, 1991
	2. I have seen others using them (Obs2)	
	3. In my community, I see many ride-hailing cars (Obs3)	
	4. They are not very visible in my community (R) (Obs4)	
	5. It is easy for me to observe others using them in my community (Obs5)	
Trialability	1. It would be easy to try them out (Trial1)	Shaw, Eschenbrenner, & Brand, 2022
	2. I can experiment using them without having to give up other means of travel (Trial2)	
	3. I can try them out without having to use them all the time (Trial3)	
	4. I am able to test various functions available in the app (Trial4)	

Appendix B. Reliability testing

Construct	Cronbach's α
Pace of life	.907
Time scarcity	.898
Digital attitudes (7 items)	.388
Digital attitudes (3 items)	.744
Relative advantage	.926
Compatibility	.912
Complexity	.585
Observability	.789
Trialability	.797

Appendix C. Confirmatory Factor Analysis

Relative advantage

Scale items	Factor loadings	Mean (SD)
RAQuality	.845	3.08 (1.149)
RAControl	.848	3.21 (1.133)
RAConv	.847	3.66 (1.062)
RAPay	.816	3.45 (1.099)
RASpeed	.829	3.57 (1.078)
RATime	.790	3.66 (1.062)
RACost	.668	2.69 (1.161)
RAOverall	.852	3.19 (1.110)

KMO=.934

Compatibility

Scale items	Factor loadings	Mean (SD)
Compat1	.925	3.24 (1.146)
Compat2	.919	3.31 (1.108)
Compat3	.923	3.36 (1.080)

KMO = .759

Complexity

Scale items	Factor loadings	Mean (SD)
Complex1	.809	2.65 (1.059)
Complex2	.848	2.54 (1.032)
Complex3	.541	3.14 (1.033)

KMO = .557

Observability

Scale items	Factor loadings	Mean (SD)
Obs1	.639	3.46 (1.024)
Obs2	.793	3.68 (1.059
Obs3	.849	3.43 (1.207)
Obs4	.610	3.32 (1.247)
Obs5	.792	3.19 (1.093)

KMO = .765

Trialability

Scale items	Factor loadings	Mean (SD)
Trial1	.791	3.70 (.894)
Trial2	.814	3.60 (.915)
Trial3	.799	3.67 (.894)
Trial4	.749	3.38 (.905)

KMO = .793

Appendix D. VIF

Predictor variable	Tolerance	VIF
Relative advantage score	.371	2.694
Compatibility score	.319	3.135
Complexity score	.989	1.011
Observability score	.610	1.639

Dependent variable: Trialability score

Appendix E. Full Stepwise Analyses

Binary logistic regression model results for adoption of ride-hailing

Variables	Model 1	Model 2	Model 3	Model 4
	Exp(B)	Exp(B)	Exp(B)	Exp(B)
Sociodemographic				
Gender (male)	.966			
Age (45 and over)	.263***	.247***	.451***	.588
Education (bachelor)	1.164			
Income (medium-high)	1.331			
Children (has kids)	1.328			
Employment (employed)	1.302			
Contextual factors	1.773			
Financial situation (OK)	.761**	1.81**	1.98**	1.708*
Car (owns car)	.169			
Household Area (countryside)	.966***	.219***	.295***	.385*
Digital attitudes				
Openness to tech		1.524***	1.085	
Social media				
Number of social media			1.273***	1.179*
Hours of social media			.99	
Social norm				
Subjective norm			2.152***	1.595***
Innovation attributes				
Relative advantage				2.22**
Compatibility				3.361***
Complexity				.733*
Observability				1.813**
Trialability				.605*
Constant	1.052	1.411	.043***	.095***
Pseudo R^2	.269	.276	.446	.646

Note: *p < .05; **p < .01; ***p < .001. We use the Nagelkerke R^2.

Binary logistic regression model results for adoption of online food delivery

Variables	Model 1	Model 2	Model 3	Model 4
	Exp(B)	Exp(B)	Exp(B)	Exp(B)
Sociodemographic				
Gender (male)	.545*	.537*	.691	
Age (45 and over)	.192***	.188***	.309***	.532
Education (bachelor)	.973			
Income (medium-high)	1.053			
Children (has kids)	1.561			
Employment (employed)	2.19**	2.119***	1.767*	1.35
Contextual factors				
Financial situation (OK)	.873			
Car (owns car)	.761			
Household area (countryside)	.343**	.379**	.343**	.376*
Digital attitudes				
Openness to tech		1.295	1.075	
Social media				
Number of social media			1.27***	1.291**
Hours of social media			1.423	
Social norm				
Subjective norm			1.4***	1.153
Innovation attributes				
Relative advantage				1.992**
Compatibility				2.282***
Complexity				.546***
Observability				1.048
Trialability				1.414
Constant	1.94	1.793**	.113***	.367
Pseudo R^2	.340	.334	.408	.591

Note: *p < .05; **p < .01; ***p < .001. We use the Nagelkerke R^2.

Binary logistic regression model results for adoption of next-day retail

Variables	Model 1	Model 2	Model 3	Model 4
	Exp(B)	Exp(B)	Exp(B)	Exp(B)
Sociodemographic				
Gender (male)	.779			
Age (45 and over)	.556**	.607*	.896	
Education (bachelor)	1.018			
Income (medium-high)	1.323			
Children (has kids)	1.662*	1.735*	1.262	
Employment (employed)	1.551*	1.679*	1.567*	1.28
Contextual factors				
Financial situation (OK)	.549**	.622*	.665*	.837
Car (owns car)	1.211			
Household area (countryside)	1.286			
Digital attitudes				
Openness to tech		1.147		
Social media				
Number of social media			1.144*	1.104
Hours of social media			1.277	
Social norm				
Subjective norm			1.523***	1.197
Innovation attributes				
Relative advantage				2.47***
Compatibility				5.361***
Complexity				.628***
Observability				.776
Trialability				.474***
Constant	.932	1.063	.105***	.277
Pseudo R^2	.133	.122	.207	.508

Note: *p < .05; **p < .01; ***p < .001. We use the Nagelkerke R^2.