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RESEARCH ARTICLE

Exploring driver and user perspectives of service quality in sharing economy transport platforms

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With the rise of the sharing economy, companies such as Uber have emerged as an alternative to traditional transport methods. Digital sharing economy platforms enable the encounter of two types of 'users': peer providers (i.e. drivers) and travellers (commonly referred as users). To acknowledge the needs of both the user and the provider, we must understand their perceptions of service quality (SQ) in this new context. However, existing research about SQ in platform-based transport focuses only on the users' perspective. Given that peer providers are an essential part of peer-to-peer transport services, this exploratory study aims to capture the perceptions of SQ from the perspective of users and drivers. Relying on service quality theory, two quality assessment scales are designed for the users and the providers, respectively. Based on the data obtained from 646 users and drivers, Structural Equation Modelling (SEM) is used to validate the proposed scales. This study contributes to the literature of quality management in the sharing economy and provides valuable insights for platform managers.

Keywords: digital platforms; peer-to-peer transport; service quality; quality management; sharing economy

1. Introduction

Fifty years ago, it would have been unthinkable that today millions of people would be using peer-to-peer transport services. It was only about a decade ago (in 2009) that Uber was founded in San Francisco as the first company specialising in peer-to-peer ride hailing. Aside from ride-hailing services, there were also many ride-sharing companies (such as Blablacar) and car-sharing firms (such as Socialcar) that emerged as new transport methods. Since then, the popularity of sharing economy services has experienced a very significant growth (Belk, 2014).

The companies that offer peer-to-peer transport services are based on a digital platform that connects the user with the provider (Benoit et al., 2017). In the case of Uber, for example, the provider would be the driver, and the platform would be Uber's mobile application or website. Following the success of the peer-to-peer business model, there has been a growing interest in analysing how to assess service quality in this new setting. In fact, previous studies have found a clear link between perceived quality and customer satisfaction (Möhlmann, 2015), as well as loyalty (Akhmedova et al., 2020; Cheng et al., 2018) in the sharing economy. Therefore, evaluating service quality in this emerging sector is essential.

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Service quality assessment scales such as SERVQUAL (Parasuraman et al., 1988) are very effective to identify and measure the drivers of service quality. After SERVQUAL was introduced (as a generic scale), researchers noted that it was necessary to develop measures of service quality that are industry-specific (Babakus & Mangold, 1992). Given that SERVQUAL is the most well-known service quality scale, it has been adapted to many industries, including transport sectors such as the railway industry (Miranda et al., 2018), airlines (Bellizzi et al., 2020) or higher education (Marimon et al., 2019b).

Nevertheless, recent studies indicated that existing scales for traditional services cannot adequately capture the perceptions of quality in sharing economy services, due to how they differ from conventional services (Amat-Lefort, Marimon, & Mas-Machuca, 2020; Cheng et al., 2018). Concretely, they observed that service quality in this sector is rooted on a hybrid interaction (online and offline) which concerns the peer provider (driver), the user and the digital platform that facilitates their encounter (Benoit et al., 2017). Thus, existing quality scales must be remodelled for peer-to-peer services, in order to take into account these differences (Amat-Lefort, Marimon, & Mas-Machuca, 2022).

For this reason, a new line of research has focused on designing quality measurement scales adapted for peer-to-peer services (Cheng et al., 2018; Ju et al., 2019). However, these studies have mainly focused on the user's perspective, which represents just one side of the interaction. Namely, shared transport services are based on the contact between two peers (the user and the driver) which are equally important in the transaction. Consequently, understanding the driver's perceptions of service quality is as relevant as exploring the user's viewpoint, but previous research has not yet investigated this topic.

Moreover, Kauffman and Naldi (2020) noted that one of the future research directions for sharing economy studies should be to cover more geographical regions. For instance, there is a scarcity of literature regarding the quality perceptions of European users of collaborative transport services. Given that peer-to-peer transport companies have a strong presence in Europe, understanding the needs of their users and drivers in different countries would allow them to adapt their services to each culture. On that account, it is necessary to explore the service quality perceptions of users and drivers of European countries.

With the aim of addressing these gaps in the literature, the present study assesses perceived quality in shared transport services, from the driver's and the user's perspective. Based on the responses of 646 travellers and providers from 4 European countries, the research goals of this study are to (i) identify the key aspects of perceived service quality for users and drivers and (ii) design and validate two scales to measure perceived quality from the driver's and the user's point of view, respectively. In terms of methodology, the responses collected through the survey are used to validate the quality assessment framework proposed, by conducting an exploratory factor analysis (EFA), followed by a confirmatory factor analysis (CFA) based on structural equation modelling (SEM).

The results obtained from this analysis will enable managers of peer-to-peer transport companies to get a better understanding of how they can evaluate service quality in their businesses. Based on these measurements, they can improve their users' and drivers' satisfaction, which is very important for their company's long-term profitability and survival.

2. Literature review

2.1. *Peer-to-peer transport services*

Within the last 10 years, peer-to-peer transport services offered by companies such as Uber and Zipcar have disrupted the mobility industry (Cramer & Krueger, 2016). These services are part of a type of business model known as the sharing economy, through which digital

platforms enable users to offer services and share assets such as their home (i.e. Airbnb). Similarly, collaborative transport users can share their unused vehicle through carsharing companies such as Socialcar. On the other hand, they can also travel within metropolitan areas through ride-hailing services (i.e. Uber) or share a vehicle and split travel costs through ride-sharing services (i.e. Blablacar).

In comparison with traditional transport methods, shared mobility services offer several advantages for drivers, travellers and society, which include saving costs and travel time, minimising pollution and reducing traffic (Furuhata et al., 2013). These are some of the reasons that have motivated passengers to use these services, making them an increasingly attractive alternative for them (Lee et al., 2018). Following the popularity of this phenomenon, researchers have investigated the motivations of shared transport users (Boateng et al., 2019), as well as the determinants of their satisfaction (Mousavi et al., 2022), trust (Mittendorf, 2017) and loyalty (Mas-Machuca, Marimon, & Jaca, 2021).

Nevertheless, given that previous studies focused mostly on the users of these services, the literature regarding the providers of these services (drivers or people who rent their unused vehicles) is very scarce.

2.2. *Providers of shared transport services*

The existing research work about peer providers of shared transport services is very scarce, particularly when compared with the previous literature focused on their passengers. To our knowledge, within the area of service quality research, previous studies in this industry have not taken into account the drivers' perspective.

Nevertheless, there have been studies that have investigated the drivers' point of view regarding their work conditions at companies such as Uber or Lyft. For instance, Möhlmann and Zalmanson (2017) interviewed Uber drivers to analyse the concept of algorithmic management and explored their mechanisms to regain their autonomy under this system. Similarly, Cheng et al. (2020) also interviewed ridesharing drivers in China, demonstrating that their degree of trust towards passengers can influence the drivers' sharing intention. In terms of the drivers' well-being, Berger et al. (2019) found that Uber drivers in London report higher levels of life satisfaction than other workers (but also higher anxiety levels). Additionally, a survey completed by drivers in Chile indicated that they appreciate the flexibility of the job but are not satisfied with the transparency of ride-hailing apps (Fielbaum & Tirachini, 2020). When analysing the reviews left by Uber and Lyft drivers Shokoohyar (2018) found similar results. More specifically, even though drivers value the job's flexibility and social interaction, they are often underpaid and experience poor job security and customer service.

Considering these findings, shared mobility platforms should pay more attention to the needs of their drivers in order to ensure their satisfaction. For this reason, the present study aims to understand not only the users' perspective of service quality, but also the providers' point of view.

2.3. *Service quality assessment in shared transport services*

Service quality is defined as the difference between the consumer's expectations of a service and their perception of that service when they experience it (Parasuraman et al., 1988). Service quality is essential to improve competitive advantage in any service company, considering that it has been positively related to several indicators of business

success. In the transport industry, service quality has been linked to user loyalty (Chou et al., 2014), and satisfaction (Eboli & Mazzulla, 2015)

Given the importance of service quality for businesses, the assessment of perceived quality is key to detect the areas of improvement of a particular service. To this end, Parasuraman et al. (1988) designed a scale known as SERVQUAL to measure perceived service quality. Being one of the most popular service quality assessment tools, SERVQUAL has been adapted to many different settings and industries. For instance, when Internet services became widespread, Parasuraman et al. (2005) proposed a new version of the scale remodelled for online services (E-S-Qual), which has also been adapted to several contexts (Petnji Yaya et al., 2017).

Afterwards, Ganguli and Roy (2010) introduced a service quality scale adapted for 'hybrid services', a type of services that combine online and offline features. Sharing economy services are rooted on a hybrid interaction established between the user and the digital platform (online) and the peer provider (offline). For that reason, the scale proposed by Ganguli and Roy was as a relevant precedent of the quality assessment tools designed for peer-to-peer services.

A study by Möhlmann (2015) was one of the first to present a scale that investigated the determinants of customer satisfaction in peer-to-peer transport and accommodation sectors. One of the dimensions evaluated in this study was service quality. However, none of the items included in the service quality dimension considered the interactions with the service provider (for example, the Uber driver) or with the online platform (such as the Uber application). Thus, this study did not take into account the quality of interactions with the service provider or with the online platform. On the other hand, the service providers' perspective was not included in the study.

Therefore, Cheng et al. (2018) argued that it was necessary to design a quality assessment scale adapted for peer-to-peer transport services. The dimensions of the scale they proposed were Structural assurance (of the platform), Responsiveness (of the platform), Information congruity (of the platform), Competence (of the service provider) and Empathy (of the service provider). Hence, their scale contained items that referred to the interaction with the platform and with the service provider. However, their survey did not include responses from service providers (only from users). Similarly, Ju et al. (2019) developed a scale that evaluates perceived service quality in peer-to-peer accommodation, from the users' point of view.

More recently, Marimon et al. (2019a) defined and validated a scale named CC-Qual to assess the perceived quality of peer-to-peer services, regardless of their sector. The scale proposed also contained dimensions for assessing the interaction with the platform and the provider. However, the fact that CC-Qual was designed as a universal scale for all the different industries in the peer-to-peer services sector implied certain limitations. More specifically, when the scale underwent the validation process, only the dimensions that were relevant to all sectors could be retained. In other words, if a dimension was very relevant but only for the users in a specific sector, it was removed from the scale, keeping only the common dimensions. This elimination process left out the peculiarities of each sector, thus conditioning the results of the study. Regarding the study's sample, the scale was based on a questionnaire that was distributed among Spanish users of peer-to-peer services.

These studies set remarkable precedents by establishing the key dimensions for assessing service quality in peer-to-peer services. Consequently, many of the dimensions included in the scales that are proposed in the present study were borrowed and adapted from previous instruments. However, these scales also presented certain opportunities for future research that the current study aims to address.

First, existing scales did not include 'trust' as a dimension of service quality, although previous research indicates that trust is essential in peer-to-peer interactions (Hawlitschek et al., 2016; Ter Huurne et al., 2017). More specifically, users of sharing economy services are required to 'place a considerable amount of trust in both the person and the platform with which they are dealing' (Ter Huurne et al., 2017).

Furthermore, previous studies investigated service quality from the user's perspective, but did not consider the provider's viewpoint. Given that the sharing economy business model is based on an interaction between two peers, both of them are equally important for the transaction (Moon, Miao, Hanks, & Line, 2019). For this reason, it is necessary to explore the drivers' perspective of service quality in shared mobility platforms.

Therefore, the present study contributes to the literature by analysing the perspectives of users and drivers in peer-to-peer transport. Additionally, this study will assess the relevance of trust as a service quality dimension.

3. Methodology

The aim of this section is to describe the methodology that was applied to design and validate two scales (one for users and one for drivers) to measure service quality in peer-to-peer transport. The scale development process was conducted following the recommendations of Nunnally and Bernstein (1967). Figure 1 shows an overview of the study's methodology.

First, an initial version of the questionnaires was defined by adapting items extracted from previous scales. The initial scale was tested through a pilot test. Second, a survey was conducted to collect the necessary data. Third, the data collected through the survey was used to refine the items proposed, by performing an EFA. Afterwards, an assessment of discriminant validity and reliability was conducted. Lastly, SEM was applied to perform a CFA in order to assess construct validity.

3.1. *Scale design*

3.1.1. *Item generation*

Based on a review of existing service quality scales, a deductive item generation process was conducted (Hinkin, 1995) to define an initial set of items. Thus, these items represent the relevant dimensions identified by previous service quality assessment frameworks.

The service quality dimensions proposed for the users' questionnaire were the following:

- Site organisation: Refers to the user-friendliness of the online platform's design. In other words, how easy it is to navigate and use the platform's website or mobile application. Adapted from Parasuraman et al. (2005) and Cheng et al. (2018).

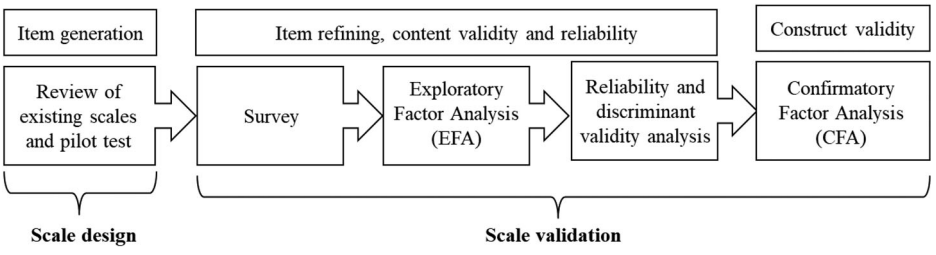

Figure 1. Overview of the scale development methodology applied.

- Platform responsiveness (Cheng et al., 2018; Ganguli & Roy, 2010; Parasuraman et al., 2005): Indicates the platform's ability to respond quickly to the users' demands and to compensate them for potential mistakes if necessary.
- Legal protection (Cheng et al., 2018; Clauss et al., 2019; Marimon et al., 2019a): Evaluates the privacy of the users' personal data, their protection from potential problems on the platform and the platform's capability to provide reliable opinions from other customers.
- Professional interaction with peer provider host (Cheng et al., 2018; Parasuraman et al., 1988): Measures the level of professionalism and competence of the peer service provider, including their driving skills and their ability to help customers.
- Social interaction (So et al., 2018): Refers to the service provider's friendliness and politeness, as well as their capacity to connect socially with their clients.
- Trust (Cheng et al., 2018; Clauss et al., 2019; Park & Tussyadiah, 2020): Measures the platform's reliability, the users' confidence in this type of service and in the peer providers.
- Comfort (Ju et al., 2019): Assesses the physical elements of the service, such as the cleanliness or visual appearance of the vehicle.

In the case of the drivers, their initial questionnaire was similar to the one for users, but each one of the questions was adapted to the perspective of the peer provider. Moreover, two of the dimensions that appeared in the passengers' questionnaire (Comfort and Professional interaction with provider) were not applicable to the drivers.

3.1.2. *Pilot study*

After the selection of initial items, the proposed scales were tested through a pilot study. An online questionnaire was distributed among members of the authors' social circle (via e-mail and social media). In total, there were 107 participants that completed the survey, which also requested them to provide their suggestions to improve the questionnaire. In order to participate in the pilot study, the requisite was to have used a shared mobility service within the last 12 months. After the pilot study, minor changes were made to the wording of ambiguous items. Other items were shortened, making them more readable and comprehensible.

In total, 24 items grouped into 7 dimensions were proposed for the users' questionnaire, while the drivers' scale contained 15 items.

3.2. *Scale validation*

In order to validate the proposed scales, an exploratory analysis was conducted, followed by a confirmatory analysis. To complete these stages of the process, survey responses of users and drivers were collected. The following sections describe how the data was collected and how the exploratory and confirmatory analysis were conducted. As a result of this process, non-significant items were removed, and construct validity was evaluated.

3.2.1. *Data collection*

The questionnaires were distributed through Netquest, a company specialised in targeting specific customer segments by means of their online panels. In order to guarantee that the

respondents were adequate for the study, the survey targeted individuals who had purchased (or offered, in the case of service providers) a peer-to-peer transport service within the last 12 months.

Therefore, the survey started with a filter question that only retained participants who indicated that they had acquired or provided a collaborative transport service in the last 12 months. Respondents who identified themselves as users were directed to the consumer version of the questionnaire, while providers were directed to their adapted version. All participants were asked to specify how much they agreed or disagreed with each one of the scale's items, based on a 5-point Likert scale, from '1 = Strongly disagree' to '5 = Strongly agree'. The Likert-scale format was selected due to its higher reliability and response rate in comparison to other question types (Babakus & Mangold, 1992; Lissitz & Green, 1975). Given that it was necessary to respond to all questions in order to submit the questionnaire, the dataset did not contain any missing values. To reduce response bias, the order of questions was automatically shuffled for each participant (Danaher & Haddrell, 1996).

To exclude possibly careless participants, different attention-checking questions were used. Additionally, respondents were asked to specify through which company had they purchased or offered the peer-to-peer transport service. They were given 7 options: 'Uber', 'Cabify', 'Grab', 'Lyft', 'Socialcar', 'Blablacar' and 'Other (specify which one)'. There were certain responses that were excluded because the subjects selected the 'Other' option and entered non-targeted services, such as 'taxi'. Table 1 displays the demographic characteristics of the consumers and providers surveys' respondents (in the case of the users, it includes the responses collected during the pilot study).

Given that previous shared transport research had not studied service quality in European countries, the study included participants from Spain, Italy, France and Portugal. These countries are part of the regional culture cluster of Latin Europe, one of the 10 groups of countries with similar cultures and shared values identified by the GLOBE project (Global Leadership and Organisational Behaviour Effectiveness) and validated in a study by Gupta and Hanges (2004). To guarantee that all participants could understand the survey (regardless of their nationality), it was translated by native speakers of Spanish, French, Italian and Portuguese.

The adequacy of the study's sample size was tested using the recommendations of Bujang et al. (2012), Iacobucci (2010) and Cattell (1978). According to these studies, the ratio between the number of respondents (N) and the number of questions in the survey (p) should be 1:3 or higher to perform factor analysis. Bujang et al. (2012) noted that studies with ratios of 1:5 obtained adequate factor solutions across different kinds of assessment scales. In terms of the required sample size to carry out SEM, Iacobucci (2010) indicated a minimum value of $N = 50$.

Taking into account that the drivers' scale contains 15 items ($p = 15$) and was completed by a total of 112 participants ($N = 112$), the sample size ratio (N:p) of the providers' study would be around 1:7. In the case of the users' scale, the number of participants was 534 ($N = 534$) and the number of questions was 24 ($p = 24$), resulting in a ratio of 1:22.

Given that these indicators are above the minimum recommended values, it can be concluded that the study's sample satisfies the requirements to perform the analysis.

3.2.2. *Exploratory analysis*

For the users' analysis, two different samples were used during the scale validation process. The sample collected during the pilot study ($N = 107$) was used to conduct an

Table 1. Demographic Characteristics of Survey Participants.

	Users		Providers	
	Num.	%	Num.	%
Gender				
Male	259	48.5%	56	50.0%
Female	275	51.5%	56	50.0%
Total	534	100%	112	100%
Age				
18–30	174	32.6%	31	27.7%
31–40	125	23.4%	23	20.5%
41–50	114	21.3%	22	19.6%
> 51	121	22.7%	36	32.1%
Total	534	100%	112	100%
Nationality				
Spain	230	43.1%	29	25.9%
Portugal	105	19.5%	27	24.1%
Italy	100	18.7%	28	25.0%
France	99	18.5%	28	25.0%
Total	534	100%	112	100%
Education				
Primary education	126	23.6%	6	5.4%
Secondary education	108	20.2%	35	31.3%
College degree	142	26.6%	24	21.4%
Postgraduate degree	0	0%	5	4.5%
Professional degree	0	0%	26	23.2%
Master's degree	158	29.6%	16	14.3%
Total	534	100%	112	100%

Exploratory Factor Analysis (EFA) to test whether the items proposed loaded correctly to each factor. The second sample (N = 427) was used to perform the CFA. In the case of the peer providers (the drivers), the same sample was used for both the EFA and the CFA (N = 112). Although performing exploratory and confirmatory analyses on the same dataset may drive to some overfitting, in this particular case it was necessary, due to the difficulty of finding a larger number of target respondents (drivers of peer-to-peer transport platforms).

The EFA, which was based on principal components analysis with Varimax rotation, was applied using the software SPSS 26. Before conducting the EFA, Bartlett's test of sphericity and Kaiser–Meyer–Olkin's (KMO) assessment of sample adequacy were calculated to confirm that the sample was adequate for factor analysis. Furthermore, a reliability analysis was carried out, as well as an analysis of discriminant validity.

The results obtained in the Kaiser–Meyer–Olkin tests (KMOs) were 0.952 for the users' scale and 0.909 for the providers' scale, indicating that the samples can be used for factor analysis. Both Bartlett tests were significant, in the case of the users' ($\chi 2(276) = 6589.14$, $p < 0.001$) and the drivers' sample ($\chi 2(105) = 983.72$, $p < 0.001$).

After the initial sample adequacy tests, two EFAs were conducted (one for the users' scale and another one for the providers' scale) to analyse the scales and retain the most significant items, applying a relatively strict selection criterion. In order to be retained, items had to (i) load at .65 or more on a specific factor; (ii) not load at more than .50 on more than one factor; and (iii) have an item-to-total correlation greater than .50. In the case of the consumers, 11 items met those criteria and 4 factors emerged: Trust,

Comfort, Site organisation and Platform responsiveness. These factors explain 59.85% of the total variance in the data. For the peer providers, 8 items were retained, and 3 factors were identified: Trust, Interaction with platform and Interaction with customer. These factors accounted for 66.99% of the total variance in the providers' data. The items and dimensions retained can be seen in Appendix A.

As a result of the item refining process, the Interaction with customer dimension emerged as a single-item measurement. This construct assesses the provider's overall impression of the customer's politeness and friendliness. While there is no doubt that measuring complex latent constructs will often require multi-item measurements, these may be substituted by single-item constructs under certain conditions (Fuchs & Diamantopoulos, 2009). In this case, retaining one single item in this dimension was the option that yielded the best reliability indices in the model.

For the assessment of construct reliability and convergent validity, additional EFAs were carried out for each dimension that emerged. In this case, the EFAs contained only the items selected in the prior stage of the scale validation process. The aim was to test the reliability and validity of the scales after the item refining process, as well as the constructs' internal consistency (Hair et al., 2011). The results obtained (which are shown on Table 2) indicate that the reliability levels of both scales are appropriate. In particular, the Cronbach's alpha statistics surpassed the cut-off value of 0.7 (Nunnally & Bernstein, 1994) in every case. Similarly, the composite reliability for each dimension also surpasses the 0.8 threshold value (Hair et al., 2011). The average variance extracted (AVE) of each case was also above the recommended minimum value of 0.5 (Fornell & Larcker, 1981), which confirms the convergent validity.

To evaluate discriminant validity, the square root of the AVE was compared to the correlations between constructs. As it can be seen in Table 3, the square root of the AVE is greater than the inter-construct correlations (Fornell & Larcker, 1981), which confirms the discriminant validity.

Taking into account the results of the analysis, it can be concluded that the measurements for each construct have been successfully validated and their reliability levels are adequate.

3.2.3. *Confirmatory analysis*

Through the EFA, the items to be retained were identified, and the underlying relationships among items and constructs were defined. Afterwards, the last step to complete the validation of the scales was to perform a Confirmatory Factor Analysis (CFA) based on structural equation modelling (SEM) using the software EQS 6.4.

In order to select an appropriate SEM estimation technique, several tests were conducted to assess multivariate and univariate normality. To evaluate multivariate normality, Mardia's coefficient (Mardia, 1970) was calculated for the users' sample (obtaining a normalised estimate value of 51.09) and for the drivers' sample (13.13). These values indicate that there is significant positive kurtosis, which is a sign of multivariate non-normality (Bentler, 1995). Regarding the univariate normality, skewness and kurtosis were calculated for the variables in both scales (see Appendix B). The results reflect that the data's distribution differs significantly from a normal distribution (Westfall & Henning, 2013).

Considering the data's non-normality, the estimation technique applied for the model was the robust Maximum Likelihood from the asymptotic variance–covariance matrix. Furthermore, Satorra–Bentler's scaled $\chi 2$ (Satorra & Bentler, 2001) was used as an adjustment to the $\chi 2$ test statistic. The software (EQS) that was used to conduct the CFA also

Table 2. EFAs for each of the scales' dimensions and statistics for their reliability analyses.

Users' scale				
Constructs/ items	**Loadings**	**Cronbach's Alpha**	**CR**	**AVE**
Trust				
tru1	0.878	0.701	0.871	0.771
tru2	0.878			
Site organisation				
org1	0.834	0.871	0.912	0.722
org2	0.877			
org3	0.845			
org4	0.842			
Comfort				
com1	0.858	0.701	0.846	0.650
com2	0.875			
com3	0.669			
Platform responsiveness				
res1	0.884	0.720	0.877	0.781
res2	0.884			
Providers' scale				
Constructs/ items	**Loadings**	**Cronbach's Alpha**	**CR**	**AVE**
Interaction with platform				
iwp1	0.855	0.860	0.906	0.708
iwp2	0.837			
iwp3	0.817			
iwp4	0.855			
Trust				
trs1	0.855	0.8	0.884	0.717
trs2	0.831			
trs3	0.854			
Interaction with customer				
iwc1	–	–	–	–

corrects the extent of non-normality reflected in parameter estimates by adjusting the standard errors (Krishnaiah, 1985). The outcomes of the Satorra-Bentler test can be seen in Table 4 (for users and providers, respectively), together with other goodness-of-fit parameters that were derived from it.

The results of the goodness-of-fit statistics indicate that the model's degree of fitness is adequate, given that their outcomes are within the recommended cut-off values. For

Table 3. Discriminant validity analysis based on Fornell-Larcker criterion. **Note**: diagonal elements (in italics) represent the square root of the AVE. The off-diagonal elements are the inter-construct correlation (significant at the 0.01 level, 2-tailed).

	Users' scale	1	2	3	4
1	Trust	*0.878*			
2	Site organisation	0.552	*0.850*		
3	Comfort	0.424	0.571	*0.806*	
4	Platform responsiveness	0.436	0.422	0.264	*0.884*
	Providers' scale	**1**	**2**	**3**	
1	Interaction with platform	*0.841*			
2	Trust	0.634	*0.847*		
3	Interaction with customer	–	–	*1.000*	

instance, the Comparative Fit Indices (CFI) are greater than 0.90 (Kline, 1998) and the Root Mean Square Error of Approximation (RMSEA) is below 0.08 in both models (Hu & Bentler, 1999). Moreover, the Non-Normed Fit Index (NNFI) and the Standardised Root Mean Square Residual (SRMR) are also within the recommended values (greater than 0.95 and below 0.08, respectively). According to Hu and Bentler (1999) these values indicate a good model fit.

Thus, according to the indicators of model fitness (see Table 4) and the results obtained from the CFA (see Appendix C), the proposed variables were shown to converge towards the factors defined in the model.

4. Conclusions and discussion

4.1. *Key findings*

The present study proposed a scale to capture the perceptions of perceived quality in peer-to-peer transport services from the user's and provider's perspectives. First, two scales were designed to assess service quality in this sector (for the users and providers, respectively). Based on the responses of 646 users and providers from 4 European countries, an EFA was conducted, followed by a CFA (based on SEM) to validate the scales proposed. In the case of shared transport users, the following key aspects of service quality were identified: Trust, Comfort, Site organisation, and Platform responsiveness. For the providers of this type of services, the relevant dimensions of service quality are Trust, Interaction with customer and Interaction with platform. All the dimensions and their items are shown in Appendix A.

As opposed to previous quality assessment scales designed for this sector, this study included the perspective of the service providers. Moreover, 'Trust' was introduced as a novel dimension of quality for this type of services. Trust is particularly relevant in sharing economy services, which are based on a transaction between strangers. Hence, this study tested the significance of trust by introducing it as a dimension in the proposed scales. According to the results obtained in the validation process, trust emerged as a relevant dimension for both users and providers in this sector.

4.2. *Theoretical implications*

This study has introduced a quality scale designed for shared transport services, with a novel approach: including the perspective of the drivers. From a theoretical perspective, the current study presents several relevant insights.

Table 4. Goodness-of-fit statistics for the users' and providers' models.

Goodness-of-fit statistics	Users	Providers
Satorra-Bentler Scaled χ^2	68.38	18.82
Degrees of freedom (df)	38	17
p-value for the Chi-Square statistic	0.0018	0.3384
χ^2/df	1.80	1.11
Comparative Fit Index (CFI)	0.971	0.993
Bentler-Bonnett Non-Normed Fit Index (NNFI)	0.958	0.988
Standardised Root Mean Square Residual (SRMR)	0.038	0.053
Root Mean Square Error of Approximation (RMSEA)	0.039	0.031
90% confidence interval of RMSEA	0.023 – .053	0 – .094

First, the results of the analysis indicate that the perceived quality of peer-to-peer transport services is a multifactorial construct, which depends on both online and offline dimensions. This does not only apply to the users, but also to the drivers. In the case of the users, service quality is composed of two dimensions related to the interaction with the online platform (Site organisation and Platform responsiveness), another dimension related to trust, and a dimension which concerns the tangible (offline) elements that make the service more pleasant (Comfort). From the drivers' perspective, one of the dimensions is related to the interaction with the online platform, and offline interactions (with the customer) also emerged as a relevant dimension of service quality, together with trust.

This is consistent with previous studies that analysed perceived quality in sharing economy services (from the user's perspective), which also included offline and online attributes (Shao et al., 2020; Ju et al., 2019; Marimon et al., 2019; Cheng et al., 2018). For instance, Cheng et al. (2018) conducted a survey which was completed by 294 users of car-hailing services in China. Their questionnaire included items to evaluate the interaction with the online platform, but also offline factors related to the interaction with the driver.

Additionally, the results show that there are certain similarities and differences between the determinants of service quality from the points of view of the user and the provider.

In terms of similarities, the dimensions that are common for both groups are the ones related to platform interaction and trust. More specifically, both the users and the drivers are concerned about the same platform-related issues: responsiveness and ease of use. However, their perceptions of 'trust' are different. From the drivers' point of view, trust related to the privacy of their personal data was found to be significant. From the users' perspective, trust towards the drivers emerged as a relevant aspect, as well as trust in the platform. Similarly, in a previous study by Mittendorf (2017) about Uber users, trust in the platform was found to influence the users' intentions.

On the other hand, while the interaction with the customer emerges as a significant dimension from the provider's point of view, the interaction with the provider is not relevant from the user's perspective. For drivers, the quality of their interaction with the user is important, but not as a purely 'social' interaction. In fact, the drivers' responses reflect that they want their clients to be polite and respectful but are not necessarily interested in engaging socially with them.

Conversely, Cheng et al. (2018) found that the interaction with the driver was a relevant dimension of service quality among car-sharing users. Moreover, their scale did not include other dimensions that were found to be significant in the current study, such as trust and comfort. The fact that these dimensions did not appear in the former model could be a reflection of the differences between users of Asian and European platforms. Hence, the results obtained in the present study can be used as a reference for future comparative studies among users from different platforms and regions.

4.3. *Managerial implications*

The results obtained in this study can be used by companies that operate in the peer-to-peer transport sector, as well as by drivers who want to improve their passengers' satisfaction.

From the digital platform's perspective, the insights provided by this study can be useful to understand how their clients perceive the quality of their services. Managers of these companies can use them to adapt their services to the specific needs of their users and drivers. For example, both users and drivers indicated that the platform's user-

friendliness and responsiveness was important. Hence, platform managers must ensure that their platform is easy to use and that it can respond quickly to the inquiries of its users and drivers.

From the drivers' point of view, the results could be used to identify the aspects that are more important for their clients, as well as the potential areas of improvement. For instance, considering that the users' responses reflected that they want the vehicle to be 'clean' and 'visually appealing', they should make sure that the hygiene of their cars is adequate at all times. Platform managers could also establish specific procedures to control the cleanliness and visual appearance of the vehicles used for their services.

4.4. *Limitations and future research*

The present study has provided significant insights to the existing literature, but it also has certain limitations.

First, the study was based on a survey completed by users and drivers from Italy, Spain, Portugal and France. Although these countries represent a significant part of Europe, it would be interesting to explore the perspective of users from other countries as well.

Additionally, even though this study included several different platforms (Uber, Cabify, etc), the potential differences between these platforms were not analysed. Thus, these platforms could be compared in future studies, in order to find out if the results vary depending on the platform used. Similarly, conducting multi-group analysis dividing participants by gender or age groups, for example, could also bring novel insights.

Finally, given that the research regarding the drivers' is still in an exploratory phase, traditional questionnaires might not be able to capture all of their views and concerns. Hence, it would be helpful to conduct interviews and/ or focus groups with drivers, in order to obtain more insightful information from them. Moreover, given the difficulty of collecting responses from drivers, the EFA and the CFA had to be conducted using the same sample of drivers.

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Appendixes

Appendix A. Validated Scales to assess perceived quality for users and providers (drivers) of shared transport services.

Users Dimension	ID	Number	Descriptive
Site organisation	org1	1	The information of the platform's site/app is well organized.
	org2	2	This platform's site/app is easy to use.
	org3	3	The platform's site/app makes it easy to find what I need.
	org4	4	The platform's site/app has easy ordering and payment mechanisms.
Platform responsiveness	res1	5	The platform resolves my complaints quickly.
	res2	6	The platform offers fair compensation for its mistakes.
Trust	tru1	7	This peer-to-peer transportation platform can generally be trusted.
	tru2	8	I believe that peer transportation providers are generally trustworthy.
Comfort	com1	9	I value that the vehicle is comfortable.
	com2	10	I value that the vehicle is visually appealing.
	com3	11	I value that the vehicle is clean.
Providers			
Interaction with platform	iwp1	1	The information of the platform's site/app is well organized.
	iwp2	2	This platform's site/app is easy to use.
	iwp3	3	The platform is always quick to respond to my inquiries.
	iwp4	4	The platform resolves my complaints quickly.
Trust	trs1	5	I feel comfortable about the privacy of my personal information on the platform.
	trs2	6	I feel peer-to-peer transportation services are generally reliable.
	trs3	7	The platform offers fair compensation for its mistakes.
Interaction with customer	iwc1	8	I value that the customer is friendly and polite.

Appendix B. Descriptive statistics for the users' and the providers' (drivers) questionnaire

Users									
Construct	Item	Mean	S.E. Mean	Std Dev	Variance	Kurtosis	S.E. Kurt	Skewness	S.E. Skew
Trust	tru1	3.99	0.04	0.82	0.67	1.17	0.21	−0.8	0.11
	tru2	3.97	0.03	0.77	0.59	0.58	0.21	−0.61	0.11
Site organisation	org1	4.11	0.03	0.75	0.57	1.11	0.21	−0.76	0.11
	org2	4.19	0.04	0.81	0.66	2.55	0.21	−1.28	0.11
	org3	4.1	0.03	0.77	0.6	1.73	0.21	−0.94	0.11
	org4	4.27	0.04	0.81	0.66	2.89	0.21	−1.41	0.11
Comfort	com1	4.37	0.03	0.76	0.57	3.35	0.21	−1.46	0.11
	com2	3.83	0.04	0.94	0.88	−0.06	0.21	−0.5	0.11
	com3	4.56	0.03	0.69	0.47	5.13	0.21	−1.92	0.11
Platform responsiveness	res1	3.5	0.04	0.88	0.77	0	0.21	−0.01	0.11
	res2	3.38	0.04	0.92	0.84	0.31	0.21	−0.07	0.11
Providers									
Interaction with platform	iwp1	3.96	0.08	0.86	0.75	1.21	0.45	−0.85	0.23
	iwp2	4.11	0.08	0.8	0.64	2.8	0.45	−1.17	0.23
	iwp3	3.71	0.09	1	1	0.39	0.45	−0.78	0.23
	iwp4	3.63	0.08	0.89	0.8	0.15	0.45	−0.35	0.23
Trust	trs1	3.55	0.09	0.95	0.9	−0.3	0.45	−0.16	0.23
	trs2	3.91	0.07	0.79	0.62	0.67	0.45	−0.51	0.23
	trs3	3.73	0.09	0.95	0.9	0.83	0.45	−0.79	0.23
Interaction with customer	iwc1	4.29	0.08	0.8	0.64	2.44	0.45	−1.33	0.23

Appendix C. Confirmatory Factor Analysis (CFA) results for the users' and providers' scales.

Users				
Dimension	**Items**	**Load**	**t-Value**	**r2**
Trust	tru1	0.713	-	0.508
	tru2	0.758	10.17	0.574
Site organisation	org1	0.783	-	0.613
	org2	0.825	14.58	0.681
	org3	0.770	10.56	0.594
	org4	0.796	12.81	0.633
Comfort	com1	0.852	-	0.726
	com2	0.453	8.24	0.205
	com3	0.781	14.93	0.610
Platform responsiveness	res1	0.793	-	0.629
	res2	0.710	10.42	0.505
Providers				
Dimension	**Items**	**Load**	**t-Value**	**r2**
Interaction with platform	iwp1	0.777	-	0.604
	iwp2	0.742	10.78	0.551
	iwp3	0.770	7.96	0.592
	iwp4	0.829	9.71	0.687
Trust	trs1	0.804	-	0.646
	trs2	0.698	6.87	0.487
	trs3	0.770	7.10	0.593
Interaction with customer	iwc1	1	-	1