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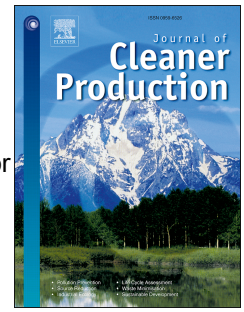

Creating a Trusting Environment in the Sharing Economy: Unpacking Mechanisms for Trust-building used by Peer-to-Peer Carpooling Platforms

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How P2P platforms create a trusting environment - the case of carpooling services

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Abstract

Establishing trust is a crucial yet significant challenge for peer-to-peer (P2P) carpooling platforms. This mixed-method study of trust-building mechanisms in carpooling platforms makes two contributions to this topic. First, a qualitative comparison of trust-building mechanisms in four platforms shows similarities regarding their reliance on review systems and contact opportunities, but differences regarding the use of GPS-tracking, the holding of offline events, and key partners, all of which represent potential trust-building measures. Second, a laboratory experiment (N = 163) suggests that these trust-building mechanisms have different consequences for car owners vs. non car owners and for more vs. less experienced customers. These findings allow us to discuss nuances regarding the development of trust in carpooling platforms, especially the difference between online trust, implicit trust, and reason-based trust. These insights indicate avenues by which sharing models, associated with the potential for more sustainable production, consumption and transportation, can be strengthened.

Keywords: Carpooling; trust; sharing economy; peer-to-peer; mixed method

1. Introduction

Sharing cars for a common journey through carpooling can reduce both the number of cars owned and the total number of cars on the road. While the environmental promise of this form of shared mobility has yet to be fulfilled (c.f. Mock & Wankat, 2024), it has grown in popularity as carpooling platforms enable large-scale sharing, facilitated by ubiquitous information and communication technologies (Casprini, Paraboschi, & Di Minin, 2015; Cohen & Kietzmann, 2014). Peer-to-peer (P2P) carpooling platforms as a specific form of shared mobility connect strangers who offer and request rides, allowing multiple individuals to share a car for a single trip (Hartl, Kamleitner, & Holub, 2020).

Unlike other sharing economy offerings, carpooling introduces unique risks, as customers get into a car with a stranger who is supposed to drive them to a certain location. This puts particular emphasis on customers' trust in the platform (Tsai, Yu, & Boonprakob, 2021). While existing studies, particularly in the context of accommodation sharing, shed light on isolated trust-building mechanisms such as the impact of reputation systems, superhost certificates (Ert & Fleischer, 2019) or user descriptions (Tussyadiah & Park, 2018), it remains unclear how platforms implement trust-building mechanisms to foster user participation. This research focuses on trust in carpooling platforms from a customer perspective, seeking to offer insights into mechanisms through which platforms create trust. Building on the sharing economy literature, particularly the literature on trust, this study additionally distinguishes between online trust and implicit trust (IT) and reason-based trust (RBT) to tackle the nuanced nature of trust in the sharing economy.

We assessed trust-building mechanisms applied by four carpooling platforms as part of their business models (BlaBlaCar, Oszkar, Zego and Carpul) (Study 1) and investigated the consequences for trust-building and behavioral intention in a laboratory experiment (Study 2). We found that while platforms may have similar cost structures and address the same customer segements, they differ in terms of key resources, revenue streams, and key partners.

Trust-building mechanisms are integral to their value propositions, influencing their key activities, channels, customer relationships, and the selection of key partners, albeit in diverse ways. We further find that car owners and non-car owners, as well as more vs. less experienced customers, react differently to trust-building mechanisms, such as offline events organized as part of customer relationships or GPS-tracking as part of platforms' key activities.

Based on these findings, in this paper we will highlight some of our key contributions to the extant literature. First, following recent calls for research (Akbari et al., 2021; Klarin & Suseno, 2021), we provide insights into the interrelationships between customers and the platform (cf. Bucher, Fieseler, Fleck, & Lutz, 2018). Second, while several studies have examined different sharing economy business models (e.g., Vaskelainen & Münzel, 2018), their consequences for performance (Jiang, Zheng, Di, Zhang, & Li, 2021) and the sustainable value creation (Curtis & Mont, 2020; Laukkanen & Tura, 2020), we elaborate on the consequences of different mechanisms for trust as a central variable for a sharing platform's acceptance and use. Third, we distinguish between three types of trust. We use the concept of online trust (Bart, Shankar, Sultan, & Urban, 2005) to measure individuals' trust in digital platforms. We further apply the approach by Castelfranchi and Falcone (2004) to differentiate between customers' implicit trust (IT), based on automatic-affective processes, and reason-based trust (RBT) in the platform, based on cognitive-rational processes (Hartl & Hofmann, 2017) to examine whether trust-building measures in the digital interface affect IT and RBT as well.

2. The Challenge of Trust in Carpooling Platforms

While trust in the sharing economy has already been widely studied (e.g., Ert & Fleischer, 2019; Möhlmann & Geissinger, 2018; Tussyadiah & Park, 2018), establishing trust is a fundamental challenge for digital platforms that connect strangers, as this constitutes a risky environment (Korczynski, 2000; Hamari, Sjoklint, & Ukkonen, 2016; Mazzella,

Sundararajan, d'Espous, & Möhlmann, 2016; Plenter, Fielt, Hoffen, Chasin, & Rosemann, 2017; ter Huurne, Ronteltap, Corten, & Buskens, 2017). From a customers' perspective, one of the primary distinctions of carpooling compared to other shared mobility services like carsharing and bike-sharing is that it involves traveling with a stranger who is driving the car. This kind of shared activity could raise concerns about personal safety or damage to personal belongings. Since customers initially interact with providers through the platform before meeting in person to share a ride, customers must trust the platform to provide a safe experience.

2.1 Distinguishing different Dimensions of Trust in the Sharing Economy

The concept of trust in the sharing economy literature is multifaceted and varies in definition (Räisänen, Ojala, & Tuovinen, 2021). Likewise, research on the sharing economy has applied a range of trust theories. For instance, Tsai et al. (2021) applied Social Exchange Theory (SET) and Self-Determination Theory (SDT) to assess carpooling barriers and drivers, including trust. Meng, He, and Khan (2019) integrated trust and role theories to examine the influence of user roles on trust, finding a shift from interpersonal to institutional-based trust. Ter Huurne and colleagues (2017) identified various measures used by sharing platforms that enforce trust, including security measures with a focus on sharing as C2C-ecommerce. Hofmann and colleagues (2017) applied the trust theory by Castelfranchi and Falcone (2004) and distinguished between implicit and reason-based trust in the provider of sharing services. These studies collectively highlight the complexity of trust in the sharing economy and the need for a multifaceted approach to understanding and managing it.

In this study, we adhere to Mayer and colleagues' (1995) definition of trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor […]" (Mayer, Davis, & Schoorman, 1995, p. 712) and focus on customers' trust in the platform. Trust in the platform

has been viewed as a foundation of the platform economy (Lu, Wang, & Zhang, 2021; Lu & Yi, 2023) and is related to institutional trust as well as online trust (Bart, Shankar, Sultan, & Urban, 2005). Institutional trust is a type of trust that is often tied to formal societal structures from institutions, systems or third parties (c.f. Shapiro, 1987; Zucker, 1986). The concept of online trust places even greater emphasis on the fact that sharing platforms operate online, unlike traditional offline stores (e.g., car rental). In contrast to offline trust, the object of trust in this case is a website, technology, or, in the case of the sharing economy, a digital platform. Following Bart et al. (2015), we argue that when consumers have a positive impression of a platform and accept their vulnerability to it, they develop trust. We thus focus on online trust in the current research to test whether the information of different trust-building measures on a website affects trust. We therefore build on the work of Bart et al. (2015), which identify different characteristics of a website that drive online trust, e.g. security, community features, and advice.

In addition, we aim to test whether the same mechanisms that enhance onlinte trust also affects implicit trust (IT) and reason-based trust (RBT) (Castelfranchi & Falcone, 2010). These two distinct qualities of trust have already been discussed in the sharing economy (Hofmann et al., 2017) as trust based on automatic-affective processes and trust based on cognitive-rational processes. IT is characterized by an automatic reaction, either triggered by specific cues or learned from good experiences (Castelfranchi & Falcone, 2010). RBT develops after deliberate considerations. Individuals trust another party when they believe the party pursues similar goals, acts with benevolence and motivation, has the competence to achieve goals, and is supported, rather than hindered, by third or external parties (Castelfranchi & Falcone, 2010; Hofmann et al., 2017). Although IT and RBT are important concepts in social psychology research and have been studies in the sharing economy, research is lacking on how they relate to online trust and whether platforms can foster these types of trust through websites, as the first point of contact with customers.

2.2 Building trust in carpooling

Given the specificity of carpooling, carpooling platforms may need to implement additional or different trust-building mechanisms compared to other platforms (e.g. carsharing platforms) to ensure users' trust and intention to participate. Even though past research provides valuable insights into trust in the online context (Bart, et al., 2005) and the intention to participate in the sharing economy, especially in accommodation sharing (Abrahao, Parigi, Gupta, & Cook, 2017; Bridges & Vasquez, 2018; Ert & Fleischer, 2019; Möhlmann, 2015), a one-size-fits-all approach may not adequately capture the nuanced trust requirements across diverse sharing economy contexts. Trust-building mechanisms are often reduced to the use of reputation systems alone, although research demonstrates that trust is much more complex (Ter Huurne et al., 2017). For instance, a review by Räisänen et al. (2021) reveals a pronounced emphasis on technology-based solutions, particularly regarding digital reputation and review systems (e.g., Ert, Fleischer, & Magen, 2016; Pera, Viglia, & Furlan, 2016).

One aspect that adds complexity to trust development in carpooling is the role of physical objects, i.e., vehicles. A car is often perceived as a valuable and personal possession (c.f. research on "car pride", Moody & Zhao, 2019), and a car owner has much higher control over their private car compared to a shared vehicle (Szamatowicz & Paundra, 2019). Research shows that people who own a car are less likely to be interested in carpooling compared to people who do not own a car (Park, Chen, & Akar, 2018). Unlike car sharing, carpooling addresses a key sustainability challenge by increasing the number of passengers per vehicle. The aim is to boost the average from 1.2 to around 1.5 passengers per car (International Road Federation, 2023), which would already lead to a 20% reduction in the number of vehicles, contributing indirectly to less traffic congestion, fewer accidents, and reduced infrastructure strain (e.g., road damage). Although the environmental benefits of shared mobility remain uncertain (c.f. Amatuni et al., 2020; Mock & Wankat, 2024; Yu et al., 2017), the more people

who opt for carpooling instead of driving their own cars, the more sustainable this mode of transportation becomes. Thus, it is important to encourage people who already own a car to refrain from purchasing a new one, and instead to join carpooling initiatives as passengers.

Another important aspect to consider is the users' expectations with carpooling, as trust changes with experience, which is also reflected in the conceptualization of IT and RBT (c.f. Falcone & Castelfranchi, 2004). Potential customers who are experienced with other sharing services might approach carpooling with a different anticipation of trust. Their familiarity with sharing economy platforms could lead to a higher initial trust in the process and a greater willingness to use it, and their specific experiences with carpooling can further shape this trust. If customers had positive experiences with platforms in the past, they may be more likely to develop implicit trust in the platform (c.f. Hofmann et al., 2017), i.e., trusting the platform automatically without evaluating reasons for trusting the platform each time. Previous research has shown that information about a P2P platform, e.g. via the platform's website, affect customers' IT and RBT (c.f. Hofmann et al., 2017; Hofmann et al., 2022).

Aiming to better understand trust-building mechanisms that carpooling platforms can implement, we address the following research questions:

RQ1: Which mechanisms for trust building are applied by carpooling platforms?

RQ2: Which trust-building mechanisms enhance potential users' trust (online trust, IT, RBT) and willingness to participate?

3. Methodology

This research combines qualitative and quantitative research methods, adopting a mixed-method approach (c.f. Mura, Longo, & Zanni, 2020) to assess how platforms apply trust-building mechanisms and how customers experience these mechanisms(see study overview in Figure 1). The qualitative approach in Study 1 (website analysis and qualitative expert interviews) provides the foundation for the quantitative approach in Study 2 (laboratory

experiment), as it aims to assess the trust-building mechansism employed by real carpooling platforms. First, a qualitative study was conducted to identify characteristics of current carpooling platforms and their use of trust-building mechanisms (RQ1). This allowed us to recognize both common trust-building mechanisms and those unique to individual platforms. Based on these insights, we selected specific trust-building mechanisms to be experimentally tested in Study 2 (RQ2). Therefore, the qualitative approach in Study 1 was instrumental in identifying relevant trust-building mechanisms and preparing the study materials or the subsequent experiment. Data collection took place at the end of 2017/beginning of 2018.

Insert Figure 1 about here

3.1.Study 1: Comparing Carpooling Platforms and Trust-Building Measures

In order to gain a deep understanding of existing trust-building measures, we selected four cases of platforms offering carpooling services. The websites of the platforms were analyzed and qualitative expert-interviews with stakeholders of each company were conducted.

3.1.1. Case Selection

The case selection is based on two main criteria: (1) homogeneity to ensure comparability, and within this, (2) heterogeneity along theoretically important dimensions of variance (Munoz & Cohen, 2017). All selected cases must provide the same core service, meaning they must (a) represent carpooling platforms that (b) match supply and demand for (c) peer-to-peer carpooling, (d) through an online platform. This selection aligns with common classifications of sharing organizations (Wruk, Oberg, Klutt, & Maurer, 2019).

To achieve theoretically relevant variance (2), we chose carpooling platforms that differ across three key indicators: (a) the scope of their operation (nationwide versus worldwide), (b) the number of registered users, and (c) years of existence. For multi-sided platforms in the

sharing economy, reaching a critical mass of users is essential, as transactions become more efficient with increased participation (Kyprianou, 2018). Therefore, business expansion, the number of registered users, and years of operation were considered indicators of success in the case selection process.

The first step was in-depth research on the relevant companies that met these criteria. It turned out that the sector is dominated by one company, BlaBlaCar. After identifying 15 companies, four platforms offering carpooling services were chosen for a comparative analysis: BlaBlaCar, Oszkár, Zego, and Carpul. BlaBlaCar is active in many different countries globally, while the three other companies operate predominantly in their home countries: Hungary (Oszkár), Italy (Zego), and Slovakia (Carpul) (for more details, see Appendix A1).

In what follows, each company's business model will be mapped and contrasted with its competitors based on data from the 2018 English versions of their websites (first stage of data collection) and four personal semi-structured in-depth interviews with a representative of each company (second stage of data collection): BlaBlaCar, Oszkar, Zego, and Carpul. Interviewees were contacted via email or professional social networking sites. Three interviews were conducted via Skype due to geographical distance and time constraints, one interview was conducted on the company's premises (for Zego in Milan, Italy). Interviews with company representatives were held in English, tape-recorded, and transcribed; they lasted between 45 and 60 minutes. At Oszkar, Zego, and Carpul interviewees were top-level management, at BlaBlaCar the interviewee was a national manager. The semi-structured interview guideline was developed based on the literature and included trust-building related questions that could not be answered through the website analysis (see first stage of data collection).

Data were analyzed following a template analysis (Brooks et al., 2015) using the nine blocks of the business model canvas of Osterwalder and Pigneur (2010) as a basis to identify

relevant themes relating to trust. The canvas includes nine building blocks, i.e., customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partners and cost structure, which provide a tangible overview about the business and hence allows comparisons. The researchers went through all transcripts paragraph by paragraph to become familiar with the data to be analyzed. Next, by highlighting relevant text passages that contribute to the research question, preliminary coding was conducted. Finally, emerging codes were organized into meaningful clusters and a final coding template was defined.

3.1.2. Results of the Qualitative Analysis

The analysis revealed similarities as well as differences between the four platforms (Figure 2; Appendix A2; Appendix A3). Trust-building mechanisms are integral to their value offerings and are part of their key activities, channels, customer relationships, and choice of key partners, though in different ways.

Insert Figure 2 about here

Platforms serve two segments of users: drivers and riders (*customer segmentation*). In contrast to Blablacar and Zego, who prohibit commercial use of the platform for drivers, and Carpul, who admits to having no control over commercial use, Oszkár explicitly allows professional drivers to use its platform. As a local platform, Oszkár has always been in direct contact with its users and after they noticed that professional drivers had started using the platform, they asked several users for their opinion before they made the decision to incorporate business drivers.

Regarding their *value proposition*, the platforms claim to be convenient and easy to use. All platforms agreed that the review system is one of the most important parts of their

business model. The global platform BlaBlaCar, specifically puts emphasis on the topic of trust. They discuss trust on their blog, stating that BlaBlaCar's core value is "In Trust We Trust" and have developed a trust framework (DREAMS) for the collaborative economy: D. (declared –photo and name) R. (rated) E. (engaged-prepaid booking) A. (active – show last time user was online) M. (moderated) S. (social – link profile to other social networks).

All platforms heavily rely on online channels (*channels*) such as websites or apps. All platforms offer contact opportunities via social media or e-mail and FAQ sections. BlaBlaCar and Oszkár inform consumers via blogs about their current activities. In contrast, Zego as a local platform relies only on word-of-mouth and on a community that is already connected.

Further, the platforms provide services in all languages, even if the company does not have a physical office in each country it operates *(customer relationship)*. In the case of disputes between its users, they try to help, albeit using different channels. BlaBlaCar is the only platform that wants to create a community and stays in touch with its users via offline events.

An important part of platforms' business model is the *revenue stream*. Whereas the bigger platforms BlaBlaCar, Oszkár, and Zego mostly rely on service fees, Carpul is free of charge for its users, covering its costs completely with revenues from advertisements. An important difference between the platforms regarding their *key activities* and *key partners* emerged: Whereas all platforms claim to reserve the right to monitor and remove users' content and users, Zego tracks all user activity and uses a GPS system to ensure their customers' safety. The biggest platform in terms of members and coverage, i.e., BlaBlaCar, cooperates with other large companies, e.g., to offer insurance in some countries. In contrast, Zego focuses on Universities and NGOs as key partners.

Study 1 shows that all platforms share similarities, especially their targeting of two types of users (i.e., car users as drivers and non-car users as riders) and their reliance on review systems and contact opportunities to foster trust, but reveal important differences in

customer relationships (e.g., organization of offline events), key activities (e.g., tracking users via GPS-System), and cooperation with other companies. Building on these results, the aim of Study 2 is to test hypotheses about the effect of different trust-building mechanisms for potential drivers (i.e., owning a car) and riders (i.e., not owning a car).

3.2. Study 2: Testing the effect of Trust-Building mechanisms

The aim of Study 2 is to test the effect of five trust-building mechanisms identified in Study 1. The selection of trust-building mechanisms focused on the similarities and differences between the platforms. Two mechanisms, peer-review systems (value proposition) and contact opportunity (channels), were chosen as features that were provided by all four platforms. Additionally, as the platforms differed in the provision of "GPS-tracking" (key activities), "offline events" (customer relationship), and "partners" (key partners), those mechanisms were used for further investigation in an experiment. These mechanisms, on the one hand, relate to the drivers identified for online trust by Bart et al., (2005), especially security, community features, and advice. On the other hand, such information presented on a website may trigger IT or foster RBT, as customers get the impression that the platform is willing and competent to pursue its goals (e.g. by being supported by other partners). Thus, Study 2 tests whether the five mechanisms derived from Study 1 ("Peer review system", "Contact opportunity", "GPS-tracking", "offline events", and "key partners") affect users' trust (Table 1).

In addition, we argue that whereas some mechanisms may be adequate to address the perceived risks of customers who have never participated in carpooling via a platform to attract new users, other mechanisms might be relevant for retaining existing users (Möllering, Bachmann, & Lee, 2004). Moreover, as car ownership is a relevant signal of social status and worth and how frequently one drives a car represents one's self-concept (c.f. Moody & Zhao, 2019), car ownership might play a relevant role in the intention to use a carpooling platform.

Thus, we hypothesize that trust-building mechanisms may affect trust differently depending on users' car ownership and experience with carpooling (Figure 3):

H1: Trust-building mechanisms influence individuals' trust in the platform, depending on individuals' level of experience with the service and car ownership.

Insert Figure 3 about here

If platforms organize their sharing transactions in such a way that trust-building mechanisms are present, individuals' intentions to use the service should increase (Hofmann et al., 2017; Möhlmann, 2015). However, different trust-building measures may impact behavioral intentions to a different extent. Thus, we tested the following hypothesis (Figure 4):

H2: Trust-building mechanisms influence individuals' behavioral intention to use the platforms' service, depending on individuals' level of experience with the service and car ownership.

Insert Figure 4 about here

3.2.1. Participants

Based on the fact that sharing platform users are typically young (18 to 29 years old) and well-educated (Akbar, Mai, & Hoffmann, 2016; Hausemer et al., 2017; PricewaterhouseCoopers, 2015b; PricewaterhouseCoopers, 2015a), this age group

represented the targeted population for the experimental study. A total of 203 students participated in the laboratory experiment (see Table 1 for sample descriptions). Data was collected in Austria in 2017 and 2018. Thirty-eight participants had to be excluded from the data analysis due to incomplete questionnaires or incorrect answers in the manipulation check, and two participants did not match the criteria of the target group (age above 29), resulting in a final sample of 163 individuals (48.5% women; M_{age} = 21.37, SD_{age} = 2.19, Range $_{age}$ = [19, 29]). The majority of participants (85.2%) reported earnings of less than 1,000 Euro per month and reported living in a city with more than one million inhabitants (65.6%). Whereas the majority reported holding a driving license (87.1%), only 36.8% of the participants owned a car. About a quarter reported having experience with carpooling services (27.0%)[1]. They mentioned BlaBlaCar, Uber, and carpooling groups on the social media platform Facebook.

3.2.2. Experimental Scenario

In the beginning, participants were confronted with a scenario in which they had moved to a new town and had to consider which mode of transportation they would use as they did not own a car. To make their decision, they viewed the homepage of an internet platform where individuals offer to share a ride. While browsing the homepages, participants were able to click on an 'information'button for more information about the business model of the platform, and on an 'area'button, revealing a map showing cars nearby.

3.2.3. Independent Variables

Participants were randomly assigned to one of five conditions with different versions of the homepage of the carpooling platform. All five homepages were identical, differing only

[1] There is currently limited data specifically on carpooling or ridesharing experiences in Europe, and more so for Austria. However, this percentage reflects the proportion of people with experience of shared mobility in Europe (see for instance, data on carsharing, Umweltberatung, 2024; Molina, Giménez-Nadal, & Velilla, 2020)

in the presentation of trust-building mechanisms (Table 1), and were designed in the style of existing homepages of carpooling offers. All other information and the presentation were kept constant over all conditions to guarantee comparability (c.f. Falk & Heckman, 2009). In addition to the manipulation, ownership of a car and experience with online carpooling was assessed.

Insert Table 1 about here

3.2.4. Dependent Variables and Control Variables

Participants had to fill in a questionnaire assessing their behavioral intention of using the service (adapted from Bart, et al., 2005) with three items: "*I would book a trip on this site*", "*I would recommend the site of this company*", "*I would register on this site*" (7-point Likert scale, 1 ("I totally disagree") to 7 ("I totally agree"), Cronbach's α = .88). Participants' trust in the platform was measured with four items (adapted from Bart et al., 2005): "*This site appears to be more trustworthy than other sites I have visited*" and "*The site represents a company that will deliver on promises*" (7-point Likert scale, 1 ("I totally disagree") to 7 ("I totally agree")) and "*My overall trust in this*" and "*My overall believability of the information on this site is*" (7-point Likert scale, 1 ("very low") to 7 ("very high"), Cronbach's α = .92). Implicit trust was measured with four items (adapted from Hofmann et al., 2017): "*I trust [the platform] without thinking about it / because there is no other alternative / automatically / without looking into it any further*" (7-point Likert scale, 1 ("I totally disagree") to 7 ("I totally agree")). Reason-based trust was measured with six items (adapted from Hofmann et al., 2017): "*I trust [the platform] because its goal seems plausible to me / because the company is committed / because the company does its job well / because the company behaves well towards its customers / because the company has the external support it needs to carry*

out its work / because the favorable external conditions guarantee the company's work" (7-point Likert scale, 1 ("I totally disagree") to 7 ("I totally agree")).

Risk perception was measured with three items ("*I believe that booking a trip via the company's internet platform is risky because the services offered may not meet my expectations/are of poor quality/entail risks*"; 7-point Likert scale, 1 ("I totally disagree") to 7 ("I totally agree"). Also, demographic variables, as well as other scales not relevant for the current study were assessed.

3.2.5. Results of the Laboratory Experiment

To test whether the aspects of business models have an effect on trust and the intention to use the service, a MANOVA was conducted, including the condition (peer-review / GPS tracking / contact opportunity / events / homepage design), experience with carpooling services (yes / no) and car ownership (yes / no) as independent variables. As expected, the analysis revealed a significant interaction of condition and car ownership on online trust, $F(4, 143) = 3.37$, $p = .012$, $\eta^2_p = .09$. Figure 5 shows that GPS-tracking and offline events are controversial trust mechanisms: Whereas offline events lead to higher trust for participants owning a car than those who do not, non-car owners report higher trust when GPS-tracking of cars is announced. Thus, hypothesis 1 can partly be confirmed: trust-building mechanisms influence users' trust in the platform depending on car ownership.

Insert Figure 5 about here

The analyses further revealed, as expected, a significant interaction of condition and experience on behavioral intention, $F(4, 143) = 3.24$, $p = .01$, $\eta^2_p = .08$, and a significant three-way interaction of condition, experience, and car ownership on behavioral intention,

$F(4, 143) = 2.50$, $p = .045$, $\eta^2_p = .07$. Figure 6 depicts the three-way interaction effect on behavioral intention. In general, participants who had experience with carpooling platforms reported higher levels of behavioral intention than those who had no experience with online carpooling services. Participants who already had experience (versus no experience) would be more likely to use the service in the case of trust-building measures, such as the review system, contact opportunity, and webpage design. Contrarily, in the case of offline events, participants with no experience (versus experience) reported higher levels of behavioral intention. Car owners were less likely to use the service in the case of GPS-tracking if they already had experience with carpooling than if they did not.

Insert Figure 6 about here

The analysis revealed a significant interaction of car ownership and experience on risk perception, $F(1, 143) = 3.93$, $p = .049$, $\eta^2_p = .03$. If participants owned a car, their perception of risk was higher if they had experience (M=4.22) vs. no experience (M=3.71). However, if participants did not own a car, their perception of risk was lower if they had experience (M=3.86) vs. no experience (M=4.27). There is no significant effect of the different trust-building measures, level of experience, and car ownership on implicit trust, only a tendency for car owners to report higher levels of implicit trust ($F(1, 143) = 3.15$, $p = .078$, $\eta^2_p = .022$). There is no significant effect of the different trust-building measures, level of experience, and car ownership on reason-based trust, only a tendency for an interaction effect of trust-building measures and experience on reason-based trust ($F(1, 143) = 2.23$, $p = .069$, $\eta^2_p = .022$).

4. Discussion

Carpooling is often discussed as a sustainable mode of transportation (e.g. Dinesh, Rejikumar, & Sisodia, 2021), as it reduces the number of cars on the road. However, to fully realize its sustainable potential, certain conditions must be met (e.g., the model of shared vehicles, the number of passengers sharing a ride, and the need for providers to replace their cars more frequently or take detours to pick up passengers). While the current study does not focus on testing the sustainable impact of carpooling, it aims to provide insights into how to encourage carpooling by introducing trust-building mechanisms, provided that the conditions for a sustainable alternative are satisfied. This study examines how a platform's trust-building mechanisms influence customers' trust and behavioral intention, contributing valuable theoretical insights. Therefore, what conclusions can we draw regarding the nature and effectiveness of a platform's trust-building mechanisms?

We demonstrated that online trust, specifically trust in a platform, is affected by trust-building mechanisms applied by the platform, with different mechnisms affecting different user segments (car owners vs. non-owners). Experience with the platform also plays a role, as it is a key component of trust. The non-significant effects observed for IT and RBT may stem from their different natures compared to digital trust.

We measured the impact of trust-building mechanisms on online trust (Bart et al. 2015), as well as IT and RBT (Castelfranchi & Falcone, 2010; Hofmann et al., 2017). Our findings indicate that these three are distinct forms of trust: the trust-building mechanisms affected online trust, but not IT or RBT. However, these different dimensions of trust may be interrelated in the sharing economy. As online trust refers to aspects like security, privacy, and functionality it is crucial for the first contact of consumers with online platforms because it has the potential to attract potential customers to interact with the platform. These elements of online trust can form a foundation for reasons to trust (RBT), as it signals the customer that the platform is motivated and benevolent and has the ability to perform. Also, if customers have positive experiences with the usability of platforms in general, they may develop an

automatic trust in platforms without reconsidering their trust in a platform each time they interact with it. Our study represents an initial investigation in this area, which should be examined more closely in future research. It is also important to note that we assessed whether participants had prior experience with carpooling platforms without evaluating whether it was positive or negative. The valence of this experience is likely crucial for developing implicit and reason-based trust and should be considered in future studies.

Second, our study raises the question of ownership in the context of carpooling. The sharing economy, including carpooling, is often promoted for its potential to reduce the ownership of goods. But how do individuals who already own these items, such as cars, respond to sharing offers? Car owners may react differently to trust-building mechanisms than non-car owners when they participate as customers. Our findings suggest this difference matters, and represents an initial step toward further investigation. Until now, research has primarily focused on car owners as potential providers of carpooling services rather than customers (e.g., Hartl, Kamleitner, & Holub, 2020). However, it is crucial to encourage car owners to not purchase new cars but to opt for more sustainable transportation, such as joining carpooling initiatives as passengers. However, car owners may face specific risks when sharing a ride with someone else driving. For instance, they may be more concerned about losing autonomy and control compared to non-car owners, who may already be accustomed to riding with others or using alternative transportation. Our study suggests that non-car owners may prioritize trust in the platform's security measures, such as GPS-tracking, which can enhance riders' trust by being perceived as a safety benefit (Sun & Edara, 2015). Conversely, car owners might view tracking devices as an invasion of privacy (cf. Elkhodr, Shahrestani, & Cheung, 2012) and as a form of surveillance. Research on GPS tracking in company cars has shown that both salespeople and managers consider systems ethical (Inks & Loe, 2005). However, similar monitoring could induce stress and a decline in loyalty to the platform (c.f., research on electronic surveillance in the workplace, Lee & Kleiner, 2003),

having the opposite effect to that intended. Recognizing these divergent concerns is vital for developing effective trust-building strategies in the sharing economy.

Although our study focused on customers' online trust, i.e., customers' trust in the platform, it is important to emphasize that trust in the sharing economy is often conceptualized as a triangle (c.f. Benoit et al., 2017): Peer-to-peer (P2P) trust is crucial. While the platform serves as the initial point of contact and can implement trust-building mechanisms to facilitate trust among users, P2P trust does not automatically develop alongside institutional trust. This is particularly important in the carpooling context, where individuals share a confined space with strangers, introducing specific risks, such as potentially dangerous behavior. Given that increasing the number of occupants per car is key to realizing sustainable benefits, passengers must trust not only the platform and private providers but also their fellow passengers. Trust in the platform still plays a significant role in fostering P2P trust, as it can enforce safety (e.g., through GPs tracking) and ensure reliability through checks and control. Future research should examine both forms of trust - institutional and P2P - simultaneously to provide a comprehensive understanding of the trust relationships in the sharing economy.

Another limitation of the current study is the generalizability of the results, which is grounded in the choice of methods and case/context of carpooling. Study 1 and Study 2 together provide a mixed-method approach to the problem of institutional trust in carpooling and complement each other. Study 1 employs cases to identify and explore trust-building mechanisms, which are tested in Study 2. Selecting four carpooling platforms may seem like only a few cases, but similar work (Guyader & Piscicelli, 2019) focused only on one case (GoMore) with valuable findings. This approach ensures that the selected cases are relevant to the research objectives, allowing for detailed and insightful comparisons that contribute significantly to understanding the studied phenomena. The experimental method used in Study 2 addresses the issue of internal validity, which is often a shortcoming in research using

predominantly archival data (c.f. Tosi, Brownlee, Silva, & Katz, 2003), but examining the research question in a laboratory experiment limits the generalizability of our results. We decided to use an artificial platform in the experiment, as the use of existing platforms might have triggered participants' knowledge of the platform's business model and participants might have already established a trusting relationship with the platform, which might have confounded the results. The results of Study 1 are based on four platforms, which fulfilled the selection criteria at the time of the data collection (pre-pandemic). Notably, the platform's performance was not the focus of the current study. However, due to the growing public interest in the sharing economy, many sharing platforms had to adapt their business model. For instance, Oszkar offers both non-profit and for-profit usage with professional drivers having different conditions (e.g., they pay a subscription fee). Also, in spring 2021 one of the platforms, Zego, was no longer providing any service via their website (http://www.zegoapp.com/). On their website, one can read the following updated statement: "We are working on the next mobility service for your city. Come back soon". Upon request, the president of Zego explained in 2021 that they are working on another carpooling project, which was on standby due to restrictions linked to the pandemic. Future research could take those developments into account and focus on the evolution of different sharing platforms by conducting a longitudinal study.

The sample used in Study 2 consisted of young and well-educated individuals, as previous research identified this group as the main customers of sharing economy services (Akbar, Mai, & Hoffmann, 2016; Hausemer et al., 2017; PricewaterhouseCoopers, 2015a). If P2P platforms want to expand their target group, it is necessary to verify the current results on trust-building mechanisms with a different sample. This limitation of external validity underscores the need for future research to examine platforms' business model and customers' trust ensuring both internal and external validity.

5. Conclusion

Research on trust in the sharing economy in general (e.g., Ter Huurne et al., 2017) and carpooling in particular (e.g., Bachmann, et al., 2018) has examined various forms of trust, often without relating them to one another. In our study, we distuingished between online trust (Bart et al., 2015), as well as IT and RBT (Castelfranchi & Falcone, 2010) in the platform. As our study indicates that selected trust-building mechanisms may affect online trust, but not IT or RBT, future research should examine how various forms of trust are interrelated. Furthermore, it is of particular importance that the same measure intended to build trust can prompt different reactions, depending on previous experience or ownership of the shared good (c.f. research on psychological ownership, Szamatovic & Paundra, 2019). To effectively build trust across diverse target groups, companies should tailor their trust mechanisms to address the specific needs, expectations, and characteristics of each group. This might involve conducting thorough market research, segmenting the target audience, and customizing strategies accordingly.

Although our study primarily focuses on the mechanisms for building trust in carpooling platforms, it is worth noting that successful promotion of these platforms can also support sustainability goals. Convincing more individuals to participate in carpooling instead of owning a car can lead to significant environmental benefits, making it an important aspect of sustainable modern urban transportation solutions.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the main author used ChatGPT and DeepL to improve language and readability before the manuscript was reviewed by a professional human proofreader. After using these tools/services, the main author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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Table 1. Sample description (Study 2)

	Percentage
Sex	
Male	51.5
Female	48.5
Income	
0-500 EUR	56.4
501-1000 EUR	28.8
1001-1500 EUR	10.4
1501-2000 EUR	2.5
More than 2000 EUR	1.8
Number of inhabitants in the place of residence	
Less then 2000	6.7
2001-5000	6.1
5001-20 000	7.4
20 001-100 000	3.7
100 001-200 000	2.5
200 001-1 million	1.8
More than 1 million	65.6
I don’t know	6.1
Car ownership	
Yes	36.8
No	63.2
Experience with carpooling	
No	73.0
Yes	27.0

Table 2. Manipulation of trust-building mechanisms in study 2

Condition	Trust-building mechanisms: Example	Operationalisation
Condition 1	Value proposition: Review system	New at "[Name of experimental website]": Reputation: Drivers can be evaluated with 0-5 stars!
Condition 2	Key activities: GPS-tracking	New at "[Name of experimental website]": GPS-Tracking for your safety: Drivers and cars can be located at any time!
Condition 3	Channels: Contact opportunity	New at "[Name of experimental website]": Contact: Customers can get in contact with [Name of experimental website] before their journey!
Condition 4	Customer Relationships: Offline events	New at "[Name of experimental website]": Events: Customers can join a communal event organized by [Name of experimental website]!
Condition 5	Key partners	New at "[Name of experimental website]": Presentation: Homepage was designed by [XY Design]!

Figure 1. Study overview

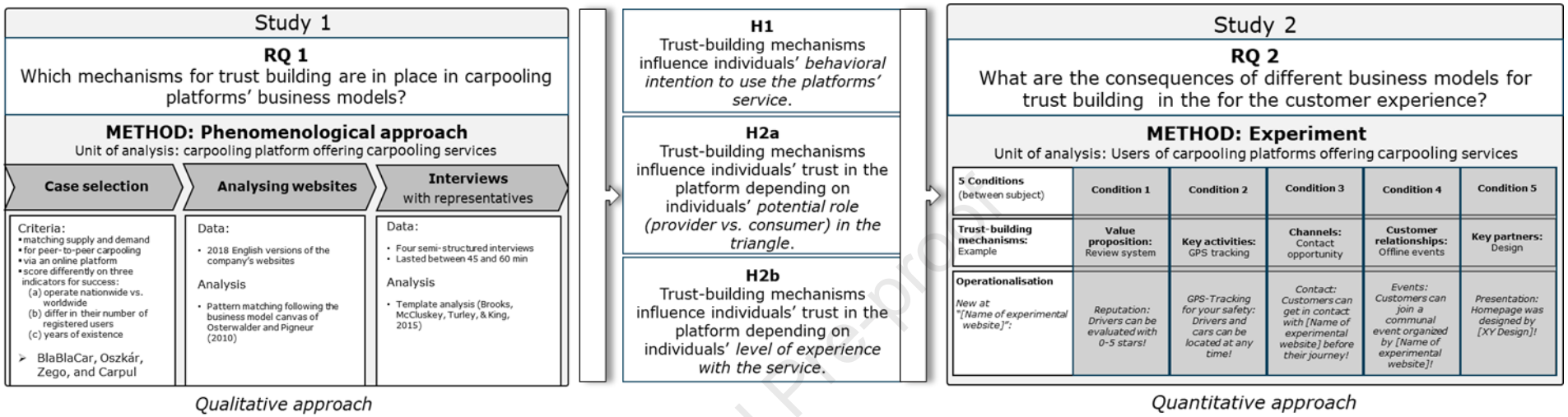


Figure 2: Overview of the specificities and commonalities of the business models of the four cases (identified in website analysis and interviews)

Figure 3. Study 2. Effect of trust-building mechansims on trust (H1).

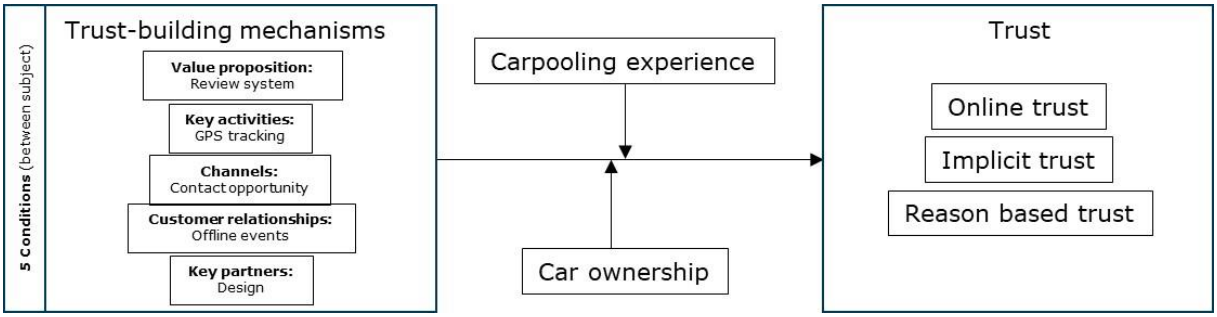


Figure 4. Study 2. Effect of trust-building mechanisms on customers' behaviorial intention (H2).

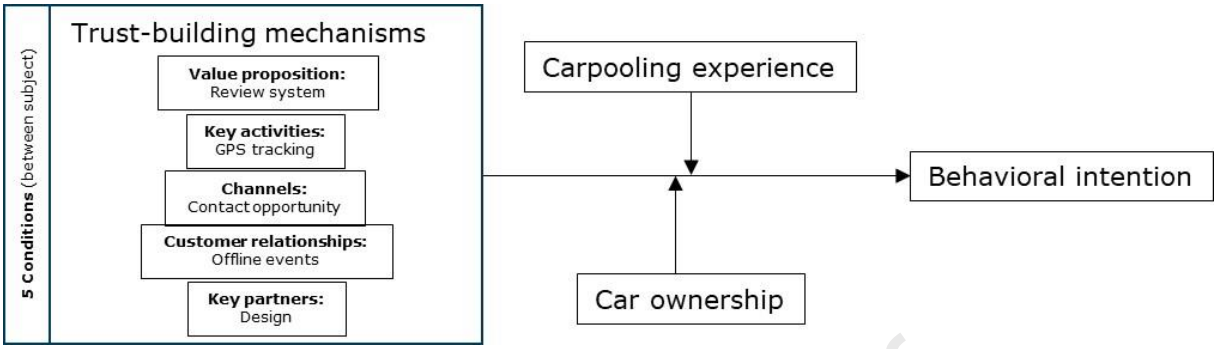
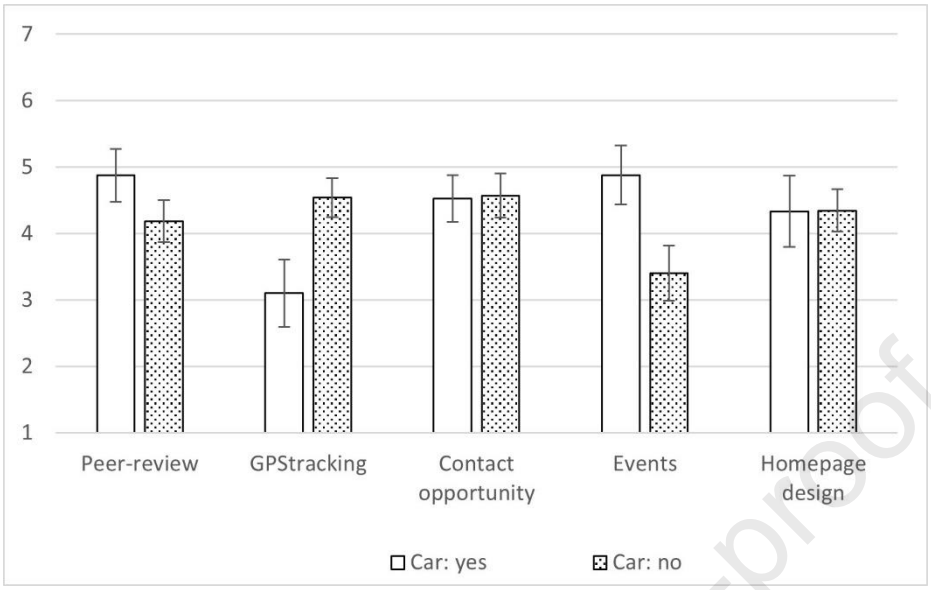
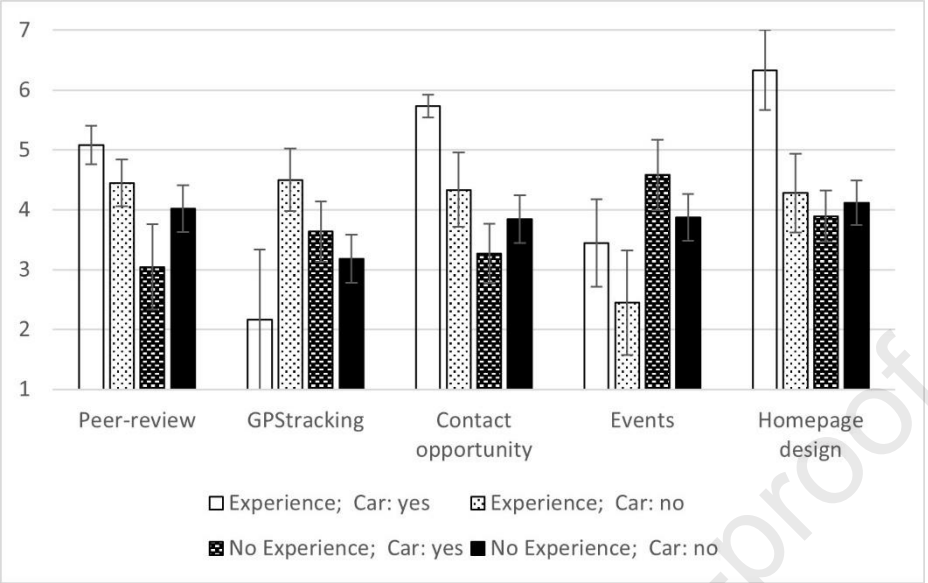


Figure 5. Study 2. Levels of participant's trust in the platform depending on experimental condition and car ownership



Note. Error indicators represent standard error of the mean

Figure 6. Study 2. Behavioral intention depending on experience (yes vs. no) and car ownership



Note. Error indicators represent standard error of the mean

Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: