International Journal of Contemporary Hospitality Management

Inside the sharing economy: Understanding consumer motivations behind the adoption of mobile applications

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IJCHM
29,9

2218

Received 1 September 2016
Revised 28 October 2016
Accepted 10 November 2016

Inside the sharing economy

Understanding consumer motivations behind the adoption of mobile applications

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Abstract

Purpose – This paper aims to investigate what motivates consumers to adopt one of the emerging mobile applications of the sharing economy, ridesharing application. Using social cognitive theory as the theoretical framework, this study develops a value adoption model to illustrate important factors that influence adoption of ridesharing applications.

Design/methodology/approach – Based on prior literature, a quantitative methodology was adopted using a survey questionnaire that allows for the measurement of the nine constructs contained in the hypothesized theoretical model. Data collected from a sample of 314 respondents in Beijing, China provided the foundation for the examination of the proposed relationships in the model.

Findings – First, the results indicate that self-efficacy is a fundamental factor that has a direct effect on consumers' perceptions of value and an indirect effect on behavioral intentions. Second, the study demonstrates that functional value, emotional value and social value are critical antecedents of overall perceived value of ridesharing applications. On the other hand, learning effort and risk perception are not significant perceived costs for consumers in adopting ridesharing applications.

Research limitations/implications – Although typical adopters of internet applications constitute a significant portion of younger consumers, the use of a college student sample in this study may affect the generalizability of the results.

Practical implications – The findings provide critical insight into consumer motivations behind adoption of ridesharing applications specifically, and for sharing economy platforms in general.

Originality/value – This study provides important theoretical implications for innovation adoption research through an empirical examination of the relationship between personal, environmental and behavioral factors in a framework of social cognitive theory.

Keywords Perceived value, Self-efficacy, SmartPLS, Adoption model, Ridesharing applications, Sharing economy

Paper type Research paper

Introduction

The sharing economy is changing resource allocation, business models and consumer behavior in many industries including tourism and hospitality (Puschmann and Alt, 2016).

This study is sponsored by China Scholarship Council (CSC) with the State Scholarship Fund.

International Journal of Contemporary Hospitality Management
Vol. 29 No. 9, 2017
pp. 2218-2239

0959-6119
DOI 10.1108/IJCHM-09-2016-0496

In fact, some have suggested that collaborative consumption can alleviate societal problems such as hyper-consumption, pollution and poverty by lowering the cost of economic coordination within communities (Hamari *et al.*, 2015). As the internet enables people to efficiently share information with unprecedented ease, the idea of a sharing economy is further heightened. From a supplier perspective, a sharing economy platform encourages individuals who have extra resources (both tangible and intangible) to get involved in a business with considerably lower-risk, without having to quit current jobs or change their lifestyles (Dredge and Gyimóthy, 2015).

In the tourism sector, the sharing economy is changing industry dynamics (Cheng, 2016; Karlsson and Dolnicar, 2016; Ert *et al.*, 2016). Peer-to-peer accommodation platforms for example, are significantly changing consumption patterns, with the social and economic appeals of this new phenomenon affecting expansion in destination selection, increase in travel frequency, length of stay and the range of activities participated in tourism destinations (Tussyadiah and Pesonen, 2015). Such platforms are having a serious impact on the hotel industry. Airbnb's entry into the Texas market, for example, has had a quantifiable negative impact on local hotel revenues, particularly lower-end hotels (Zervas *et al.*, 2016). While the economic aspect is arguably one of the key driving factors when opting for a sharing economy experience, it does not account for the current popularity of the social phenomenon alone (Forno and Garibaldi, 2015). Adoption of collaborative consumption services has also been shown to be driven by familiarity, service quality, trust and utility (Möhlmann, 2015). It has also been proposed that consumers are attracted by the social benefits the sharing economy might provide. Guests of Airbnb, for example, experience community-focused and social atmosphere at their host's house, and even gain local connections with the host's help (Kim *et al.*, 2015).

In the transportation sector, fast-expanding Uber has taken a dramatic amount of business from taxi companies in cities where it operates around the world. In 2015, for example, the company was signing up over 1,100 new ridesharing partners every month in Australia (Allen, 2015). Uber is essentially a ridesharing application (RA) or a mobile application provided by a transportation network company to order a car ride online. From a consumer perspective, RAs are attractive because they offer lower prices, better accessibility, great flexibility, ease of use and "a user focused mission" including transparency and interactive communication (Dredge and Gyimóthy, 2015; Wallsten, 2015). A 2014 survey report of consumers by PricewaterhouseCoopers (2015) found that the majority agreed that the sharing economy made life more convenient and efficient (83 per cent), was better for the environment (76 per cent), built a stronger community (78 per cent) and provided more fun than engaging with more traditional companies (63 per cent) (PWC, 2015). As a result, RA has been expanding in many countries across world, including China, where two predecessors to Uber – Didi and Kuaidi – emerged in 2012 (Shih, 2015). The characteristics of RA from technology, business and economics perspectives are:

- a location-based ride-hailing software system;
- a third-party mobile commerce platform providing services for drivers and passengers which integrate online information, transaction and evaluation functions; and
- a sharing economic model combining online information sharing and offline vehicles sharing (Hasan and Birgach, 2016).

Despite the fact that these applications are significantly impacting traditional business and economic models, few studies have investigated how consumers are motivated to accept and

adopt RA. Specifically, while the rapid emergence of this new consumption model is increasingly discussed in both industry and academic circles (PWC, 2015; Puschmann and Alt, 2016), beyond anecdotal evidence, there is a dearth of understanding as to why people participate in collaborative consumption (Hamari *et al.*, 2015), particularly in emerging markets (Cheng, 2016). This study therefore sets forth to empirically investigate factors that affect consumer adoption of ride-sharing applications and provides a new theoretical model that contributes to the emerging literature on the sharing economy through the lens of technology acceptance.

This paper is structured as follows. The next section examines the prior innovation adoption theories, and this is followed by a theoretical framework of value-based adoption based on the well-established social cognitive theory (SCT). Next, the research hypotheses are developed based on the theoretical support established in the relevant literatures. The paper then outlines the research methodology adopted and presents the analysis and results. The paper concludes with relevant discussion of theoretical and practical implications, as well as research limitations.

Conceptual foundations of consumer technology acceptance

One of the most widely used conceptual frameworks for theorizing why users accept or reject a certain information technology (IT) is the technology acceptance model (TAM) (Legris *et al.*, 2003; Wang *et al.*, 2006). TAM includes a concise structure with perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989), which is popular for its understandability and simplicity (King and He, 2006). A large number of studies have embraced TAM as a fundamental theoretical framework, and some have extended TAM by adding specific variables to different subjects such as perceived playfulness to World Wide Web (Moon and Kim, 2001), intrinsic motivation to information systems (Venkatesh *et al.*, 2002), social factors to online gaming (Hsu and Lu, 2004), perceived enjoyment to hedonic information systems (Van der Heijden, 2004) and perceived risk and trust to online payment (Yang *et al.*, 2015). However, empirical research suggests that TAM-related models only provide comparatively lower explanatory power in predicting adoption intention (Legris *et al.*, 2003). One probable reason is that TAM simplifies the influence of human-related factors without taking the subjective norm into consideration (Zhu *et al.*, 2010). TAM was originally proposed by Davis (1989) to deal with information system acceptance in organizational settings, which may not be suitable to predict user intention in a relatively voluntary environment (e.g. acceptance of RA), especially when the extended models do not include human-related factors (Chan and Lu, 2004; Moon and Kim, 2001) such as prior experience and capability of users.

Similarly, derived from the same theory of reasoned action (TRA) with TAM, the theory of planned behavior (TPB) (Ajzen, 1991) model generally better explains behavior intention by paying more attention to attitude, subject norm and perceived behavior control in an organization setting. By introducing social and individual cognitive variables, the extended or decomposed TPB models explain much more of users' intention than TPB and TAM do (Taylor and Todd, 1995; Hsu and Chiu, 2004; Pavlou *et al.*, 2006). Certainly, individual factors are crucial in enhancing the explanatory power of an acceptance model, especially in the market setting of personal information technology such as RA.

With the rapid development of the internet, a large number of online platforms (e.g. online shopping, e-banking, mobile payment, etc). have been developed, providing a variety of information services to consumers in a voluntary market setting rather than an organizational mandatory setting. In other words, the user is no longer a passive actor who simply responds to stimuli, but rather justifies by him/herself what technology is worthy of

adopting with visible and/or invisible costs (Xiang *et al.*, 2015). Following this approach, a value-based adoption model (VAM) is proposed to interpret consumers' adoption intention of mobile Internet services by capturing perceived benefit and cost factors as antecedents of perceived value (Kim *et al.*, 2007; Kleijnen *et al.*, 2007). Focusing on the overall value of hedonic digital artifacts and wearable devices, Turel *et al.* (2010) and Yang *et al.* (2016) demonstrated the salient relationship between perceived value and behavioral usage. Prior empirical results indicated that VAM achieved better model performance than TAM, yet VAM failed to provide a strong explanatory power for intention (Kim *et al.*, 2007; Zhu *et al.*, 2010). To better understand consumer adoption of the emerging RA, this study uses the social cognitive theoretical framework to develop a specific value adoption model to investigate factors that influence RA adoption. Specifically, this study aims to:

- examine how human self-cognition influences the evaluation of RA and predicts the adoption intention of RA; and
- understand the significance of perceived benefits and costs of RA adoption.

Table I presents a summary of previous major studies on adoption of innovative information technologies or services. Most studies examine user adoption of IT innovations by adopting TAM, TPB, and VAM, as well as their extended models. The literature seems to have evolved from focusing on organizational settings to individual settings, from mandatory use to voluntary adoption, from information systems to mobile applications, and from parsimonious models to extended models. The table describes the relevant antecedents included in each study, and the explanatory power of the proposed model.

Proposed research framework and model

Social cognitive theory

SCT is a framework for understanding, predicting and changing behavior which depicts human behavior as a result of the interaction between personal factors, behavior and the environment (Mohammadi, 2015). SCT agrees to a model structure that is based on triadic reciprocal relationships. The schematization of triadic reciprocal determination is shown in Figure 1(a) (Bandura, 1986, 2012). In this triadic codetermination, human functioning is the result of the interaction of intrapersonal influences, the behavior individuals are involved in and the environmental forces that affect them (Bandura, 2012). As the subject of cognition and behavior, people are self-organizing, proactive, self-regulating and self-reflecting (Bandura, 1986). Human behavior can be a representation of the cognition of themselves and the environment around them. In the context of innovation acceptance research, the cognitions of human and environment are respectively represented by self-efficacy and perceived value. Self-efficacy is defined as the individual judgments of a person's capabilities to perform a behavior (Bandura, 1986). Furthermore, attitude or intention to use are deemed as behavioral determinants. The new triadic reciprocal relationship is shown in Figure 1(b), in which the solid line represents before-adoption and the dotted line post-adoption (Zhu *et al.*, 2010). Self-efficacy, as the beliefs of one's ability to use a certain product or service, influences one's evaluation of the environment and outcome expectations (Bandura, 2012) (i.e. the relationship of R1 and R2). Creating value for customers is deemed as the reason why the enterprise exists (Sweeney and Soutar, 2001). If a consumer's behavior is "value-driven", then perceived value could partially interpret the behavioral determinants – attitude and intention, which is R3. During post-adoption, the results of behavior will inform cognition of self-efficacy and judgment of perceived value (i.e. R4 and R5), and the performance of previous value perception also will affect, as well as adjust, one's self-efficacy beliefs, reflecting R6. As

Table I.
Previous studies on adoption model

Authors	Study focus and setting	Sample size	Model	Antecedent variables and (R^2)
Davis (1989)	Information system (word processing software) in organization setting (Voluntary)	107	TAM	PU*, PEOU, AT → AI (R^2 = 0.47)
Moon and Kim (2001)	World Wide Web	152	TAM	PU, PEOU, AT → AI (R^2 = 0.35)
			Extended TAM	PU, PEOU, AT and PP → AI (R^2 = 0.39)
Van der Heijden (2004)	Movie website	1,144	Extended TAM	PU, PEOU and PE → AI(R^2 = 0.35)
Venkatesh and Davis (2000)	Information system in organization setting (Mandatory)	38	TAM2	SN, image, job relevance, output quality, result demonstrability (Experience as moderator) → PU, PUOE → AI (0.52)
	–(Voluntary)	36	TAM2	SN, image, job relevance, output quality, result demonstrability (Experience as moderator) → PU, PUOE → AI (0.39)
Venkatesh and Bala (2008)	Information system in organization setting (Voluntary)	156	TAM3	SN, image, job relevance, output quality, result demonstrability; SE, PBC, computer anxiety, PP, PE, objective usability (experience and voluntariness as moderators) → PU, PUOE → AI (0.48)
Yang *et al.*, 2015	Online payment	870	Extended TAM	Economic, function, security, time, privacy, social, service and psychological Risks → Total Risk, PU, PEOU, Comparison → TR → AI (R^2 = 0.55)
Venkatesh *et al.* (2003)	IT in organization setting	339	UTAUT	Performance expectancy, effort expectancy, SI and FC → AI (Adjusted R^2 = 0.30) Performance expectancy, effort expectancy, SI, FC and moderators (age, gender, experience and voluntary) → AI (Adjusted R^2 = 0.70)
Oliveira *et al.* (2016)	Mobile payment	301	UTAUT2 + DOI	Compatibility, innovation, performance expectancy, effort expectancy, SI, FC, hedonic motivation, price value, perceived technology security → AI (R^2 = 0.72)
Taylor and Todd (1995)	Computing resource center in organization setting (Voluntary)	786	TAM	PU, PEOU, AT → AI (R^2 = 0.52)
			TPB	AT, SN, PBC → AI (R^2 = 0.57)
			Extended TPB	PU, PEOU, compatibility; peer influence, superior's influence; SE, resource FC, technology FC → AI (R^2 = 0.60)
Hsu and Chiu (2004)	World Wide Web	239	Extended TPB	PU, PP, PR, general internet SE → AT, interpersonal norm, social norm, Web-specific SE, perceived controllability → AI(R^2 = 0.50)

(*continued*)

Table I.

Authors	Study focus and setting	Sample size	Model	Antecedent variables and (R^2)
Pavlou *et al.* (2006)	E-commerce	312	Extended TPB	TR, PU, PEOU, product value, monetary resources, product diagnosticity, information protection, purchasing skills, controllability, SE → SN, AT and PBC → AI(R^2 = 0.55)
Kim *et al.* (2007)	Mobile internet	161	VAM TAM	PU, PE, technicality, perceived fee → PV → AI (R^2 = 0.36) PU, PEOU → AI (R^2 = 0.13)
Kleijnen *et al.* (2007)	Mobile channel	375	VAM	Time convenience, user control, service compatibility, risk, cognitive effort (time consciousness as moderator) → PV → AI (R^2 = 0.39)
Turel *et al.* (2010)	Hedonic digital artifacts (Ringtones)	422	VAM	Escapism, enjoyment → Playfulness value, appeal value, social value, value for money → PV → AI (R^2 = 0.44)
Yang *et al.* (2016)	Wearable devices	375	VAM	Functionality, compatibility, visual attractiveness, brand name → PU, PE, social image, performance risk, financial risk → PV → AI (R^2 = 0.53)
Zhu *et al.* (2010)	Mobile auction	487	SVAM	FV, SV, EV, subjective GSE, objective GSE → SE, perceived cost, PV → AT → AI (R^2 = 0.72)
Alalwan *et al.* (2016)	Mobile banking	343	Extended TAM	SE → PU, PEOU, PR → AI(R^2 = 0.58)

Notes: *PU = Perceived Usefulness; PEOU = Perceived Ease of Use; AT = Attitude; AI = Adoption Intention; PP = Perceived Playfulness; PE = Perceived Enjoyment; SN = Subjective Norm; SE = Self-efficacy; PBC = Perceived Behavior Control; TR = Trust; SI = Social Influence; FC = Facilitating Conditions; PR = Perceived Risk; PV = Perceived Value; FV = Functional Value; SV = Social Value; EV = Emotional Value

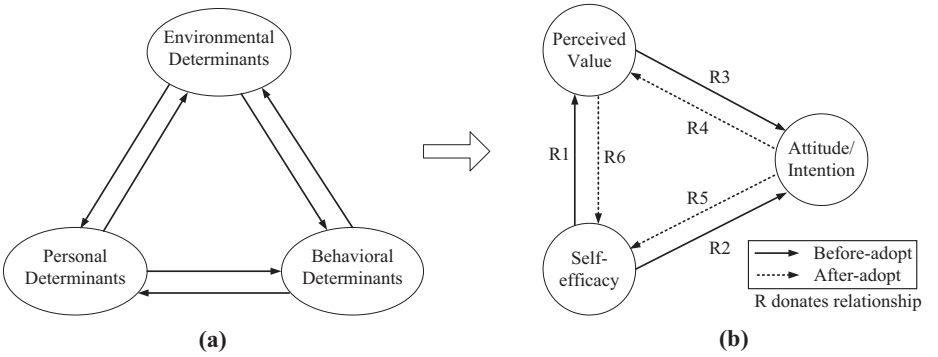

Figure 1.
The theoretical framework of self-efficacy-based value adoption model

Source: Adapted from Bandura (2012)

the present study only focuses on the before-adoption phase, rather than post-adoption, we examine the relationships of R1-R3 to explore the reasons why consumers adopt a new technology or service. Although Bandura (2012) summarizes that self-efficacy is a crucial influence on behavior determinants, few studies have adopted his entire theoretical framework for examining the user acceptance model and the relationships between self-efficacy and some specific perceived values, thus providing a strong justification for conducting this research.

Perceived value theory

SCT holds that cognized goals and personal standards rooted in value systems function as further incentives and guides for action through self-reactive mechanisms (Bandura, 2012). From a marketing perspective, the concept of value is fundamental to the understanding of consumer behavior (Gallarza *et al.*, 2011). Consumers' perceived value is viewed as their overall assessment of product utility based on perceptions of what is received (benefits) compared to what is given (costs) in a service encounter (Zeithaml, 1988). In the marketing literature, researchers have used different terms to describe value, such as consumption value, customer value, consumer value and perceived value (Kim *et al.*, 2007). Most notably, the well-known Sheth-Newman-Gross model (Sheth *et al.*, 1991) proposed multiple values including functional, social, emotional, epistemic and conditional value. In contrast, Sweeney and Soutar (2001) developed four distinct dimensions of value: emotional value, social value (enhancement of social self-concept), functional value (quality/performance) and functional value (price/value for money). Rintamäki *et al.* (2006) further summed up the value into utilitarian, hedonic and social dimensions. Value has also been described in negative terms. For example, Gallarza and Saura (2006) proposed that perceived monetary price, perceived risk and time and effort spent may be barriers for student travelling behavior, and Yang *et al.* (2016) suggest that perceived performance risk and financial risk are the main constraints to the adoption of wearable devices. In this study, with reference to the literature above and considering the characteristics of RA, we use a framework that incorporates perceived benefits (functional, emotional and social value) and perceived costs (learning and risk cost). The next section reviews an important theoretically related predictor of value, self-efficacy.

Hypotheses development

Self-efficacy of ridesharing application

Self-efficacy is deemed as a foundational determinant of behavior because it affects behavior both directly and indirectly (Bandura, 2012). Information systems researchers have presented and measured many different types of self-efficacy, including general self-efficacy (Schwarzer *et al.*, 1997), computer self-efficacy (Compeau and Higgins, 1995), internet self-efficacy (Marakas *et al.*, 2007), Web-specific self-efficacy (Hsu and Chiu, 2004) and software-specific self-efficacy (Agarwal *et al.*, 2000). According to SCT, self-efficacy of RA is defined as the beliefs that one's capability can successfully perform ridesharing through a mobile application (Bandura, 1986). Although prior researchers have conceptualized self-efficacy as the antecedent of some factors in TPB-related models (Pavlou *et al.*, 2006; Hsu and Chiu, 2004; Taylor and Todd, 1995), TAM-related models (Mun and Hwang, 2003; Venkatesh and Bala, 2008; Alalwan *et al.*, 2016) and specific self-efficacy studies (Compeau and Higgins, 1995; Agarwal *et al.*, 2000; Marakas *et al.*, 2007), few studies put self-efficacy into the framework of SCT to examine the fundamental effects of self-efficacy in innovation adoption research. However, the self-efficacy-based TAM model has demonstrated that self-efficacy has a significant influence on PU. For example, Alalwan *et al.* (2016) denoted that the more self-efficacy banking customers have, the more PU of mobile banking. Similarly, Zhu *et al.* (2010) have demonstrated the salient relationship between self-efficacy and perceived functional value for mobile applications. As such, cognition of self-efficacy is likely to affect the perception of the functional value. On this basis, we propose the following hypothesis:

H1. Self-efficacy of RA is positively related to perceived functional value.

People's beliefs in their capabilities also play a crucial role in their self-regulation of emotional states, which affects the quality of their emotional life and their vulnerability to stress and depression (Bandura, 2012). Hedonic motivation is confirmed as one of pivotal factors to adopt a new mobile application (Turel *et al.*, 2010; Yang *et al.*, 2016; Oliveira *et al.*, 2016). Yim *et al.* (2012) found that self-efficacy positively moderates participation enjoyment for customers, and that self-efficacy and other efficacy can directly enhance participation enjoyment. Empirical research has also found a significant association between self-efficacy and the emotional value of a mobile auction application (Zhu *et al.*, 2010). Analogously, as a novel online to offline (O2O) application, the emotional value of RA is enhanced when self-efficacy increases. Thus, we propose that:

H2. Self-efficacy of RA is positively related to perceived emotional value.

Although social image or social values have been demonstrated as important antecedent variables of perceived value (Turel *et al.*, 2010; Zhu *et al.*, 2010; Yang *et al.*, 2016), few studies have examined the relationship between self-efficacy and perceived social value. Empirical examination of such a relationship is significant, given that the social aspect has been identified as a critical stream of research in the context of the sharing economy (Cheng, 2016). The literature suggests that people with strong self-efficacy are more likely to believe that they can live like others who they admire (Bandura, 2012). Therefore, we hypothesize that:

H3. Self-efficacy of RA is positively related to perceived social value.

In this study, we argue that self-efficacy is also conceptually related to perceived learning cost. Learning cost is formed partly by the perceived complexity of technology itself as well as the user's personal determinants. Empirical research supports the strong association between self-efficacy and PEOU (Wang *et al.*, 2003; Zhao *et al.*, 2008; Alalwan *et al.*, 2016).

When individuals have adequate beliefs about their ability to use new IT, they tend to believe that mastering the innovation is not difficult. Thus, it is conceivable to suggest that when consumers have a high level of self-efficacy of RA, they perceive lower learning cost. Therefore, we hypothesize that:

H4. Self-efficacy of RA is negatively related to perceived learning cost.

The perceived uncertainty and potential loss for initial acceptance of emerging technologies could derive from human-related or technology-related determinants, as well as multi-faceted reasons, such as physical and psychological factors. The effect of perceived risk of innovation adoption could often be counteracted by consumers' self-efficacy or confidence in their capability to exert personal control (Luo *et al.*, 2010). Empirical studies have shown that self-efficacy negatively affects perceived risk in the business-to-customer e-commerce environment (Kim and Kim, 2005) and mobile payment settings (Luo *et al.*, 2010). Hence, we propose the subsequent hypothesis:

H5. Self-efficacy of RA is negatively related to perceived risk cost.

The overall value assessment of an IT innovation (including benefits and costs) is perceived differently between different consumers. For example, research shows that a consumer's individual experience and preference could affect the perception of a product's value (De Kerviler *et al.*, 2016; Orth and De Marchi, 2007). Perceived value is a psychological evaluation, which not only arises from the product itself but also originates from the consumers themselves (Tynan *et al.*, 2010; Chen and Lin, 2015). Although the relationship between self-efficacy and the above different perceived value constructs can be established in the literature, few studies have examined the relationship of self-efficacy and overall perceived value in a value-based adoption framework in O2O mobile application settings. Therefore, this study hypothesizes that:

H6. Self-efficacy of RA is positively related to perceived value.

SCT holds that efficacy beliefs not only determine how environment opportunities and impediments are perceived (Bandura, 2006), but they also affect choice of activities, how much effort is made on an activity, and how long people will persist when confronting obstacles (Pajares, 1997). People avoid activities that they believe are beyond their coping capabilities, but they undertake and perform assuredly those that they judge themselves capable of managing (Bandura, 1982). Hsu and Chiu (2004) also found that general Internet self-efficacy saliently affects attitude, and Compeau and Higgins (1995) demonstrated the critical role of self-efficacy in influencing behavior intention. Hence, we propose that:

H7. Self-efficacy of RA is positively related to attitude.

H8. Self-efficacy of RA is positively related to adoption intention.

Perceived benefits

One of the most important components of perceived benefits is functional value, which is defined as "the perceived utility acquired from an alternative's capacity for functional, utilitarian, or physical performance" (Sheth *et al.*, 1991, p. 160). VAM-related models have denoted that functional value is a key factor contributing to perceived value (Kim *et al.*, 2007; Zhu *et al.*, 2010; Turel *et al.*, 2010; Yang *et al.*, 2016; De Kerviler *et al.*, 2016). RA attempts to help users accomplish several functions, from online booking and offline consuming to

online payment and evaluation through an information system platform on mobile devices, thus enhancing perceived overall value. Therefore, we hypothesize that:

H9. Perceived functional value is positively related to perceived value of RA.

Emotional value focuses more on intrinsic affective motivation in contrast to perceived functional value, which emphasizes on extrinsic cognitive motivation. Emotional value is the perceived utility derived from the feelings or affective states that a product generates (Sweeney and Soutar, 2001). As such, emotional value is conceptually similar to perceived enjoyment (Van der Heijden, 2004; Kim *et al.*, 2007; Venkatesh and Bala, 2008; Yang *et al.*, 2016) and perceived playfulness (Hsu and Chiu, 2004; Turel *et al.*, 2010). Kim *et al.* (2013) suggest that hedonic motivation is the most important reason why mobile users continually engage in mobile activities. In consumer research, perceived emotional value is also found to have a salient effect on perceived value (Kim *et al.*, 2007; Turel *et al.*, 2010; Yang *et al.*, 2016; Chang *et al.*, 2016). Therefore, we hypothesize that:

H10. Perceived emotional value is positively related to perceived value of RA.

Social value represents the perceived utility acquired from an alternative's association with one or more specific social groups (Sheth *et al.*, 1991). Prior value-based mobile services studies showed conflicting results on the conceptual link between social value and perceived value. For example, Turel *et al.* (2010) found that social value does not significantly affect overall value of hedonic digital artifacts, whereas Kim *et al.* (2013) showed that social motivation is one of the reasons why mobile users engage in mobile activities. More recently, Yang *et al.* (2016) noted that social image has the strongest effect on perceived value for potential and actual wearable device users. On this basis, we hypothesize that:

H11. Perceived social value is positively related to perceived value of RA.

Perceived costs

Learning cost can be defined as the perceived effort required to understand and master the usage of RA, a definition which is similar to Davis' (1989) description of PEOU. Kleijnen *et al.* (2007) suggest that the complexity of technology or devices increase the cognitive effort of understanding the mobile service process that may be perceived as a barrier. Empirical research has demonstrated that complexity and effort negatively affect perceived value of social media during travel information search (Chung and Koo, 2015). Therefore, we hypothesize that:

H12. Perceived learning cost is negatively related to perceived value of RA.

When perceived risk was initially proposed in consumer behavior research, the discussion was limited to fraud or product quality, but it has recently been defined in relation to financial, physical, psychological and social risks in a non-face-to-face e-commerce setting (Hanafizadeh *et al.*, 2014). This study defines perceived risk as "the potential for loss in the pursuit of a desired outcome of using an e-service", which is commonly accepted in the context of online transactions (Yang *et al.*, 2015; Martins *et al.*, 2014). As an emerging O2O service, however, RA may be perceived to be associated with risks not only from online booking and transaction but also offline consumption and experience, involving financial, privacy, physical and legal risks (Cheng, 2016). For example, the legality of RA has been challenged by governments and taxi companies that allege that using drivers who are not licensed to drive taxicabs is unsafe and illegal (Feeney, 2015). However, research findings on

the effects of perceived risk are inconclusive. Some studies have shown that perceived risk has a significant negative effect on behavior intention (Martins *et al.*, 2014), trust (Yang *et al.*, 2015), attitude (Lim and Ting, 2014) and perceived value (Kleijnen *et al.*, 2007; Yang *et al.*, 2016; Chang *et al.*, 2016). But others have found that perceived risk does not always exert a significant effect on perceived value and adoption intention (De Kerviler *et al.*, 2016), highlighting the need to examine the conceptual linkage between perceived risk and perceived value. On the basis of previous research, we hypothesize that:

H13. Perceived risk cost is negatively related to perceived value of RA.

Perceived value

This study uses Zeithaml's (1988) framework as the basis for measuring perceived value in the context of RA. The perceived value of RA is defined as a consumer's overall assessment of the utility of RA based on the perception of what is received and what is given. Empirical studies (Kim *et al.*, 2007; Kleijnen *et al.*, 2007; Turel *et al.*, 2010; Chung and Koo, 2015; and Yang *et al.*, 2016) have demonstrated that perceived value significantly affects intention to use. Similar findings have also been reported in studies of product selection (Zeithaml, 1988), brand choice (Arvidsson, 2005), satisfaction (Chen and Lin, 2015; Chen and Tsai, 2008; Lai, Griffin and Babin, 2009), loyalty (Chiou, 2004; Chen and Tsai, 2008; So *et al.*, 2013) and continuance intention (Chen and Lin, 2015). Therefore, we hypothesize that:

H14. Perceived value of RA is positively related to attitude.

H15. Perceived value of RA is positively related to adoption intention.

Attitude and adoption intention

Attitude is defined as an individual's overall evaluation of performing a behavior (Davis, 1989). According to TPB, attitude impacts users' behavioral intention, which in turn influences their actual behavior (Ajzen, 1991). Previous studies suggest that attitude is a key antecedent of adoption intention (Taylor and Todd, 1995; Moon and Kim, 2001; Hsu and Lu, 2004; Zhu *et al.*, 2010). Although many studies have chosen to directly examine the relationship between perceived value and intention (Kim *et al.*, 2007; Turel *et al.*, 2010), attitude is also an important construct that mediates the impact of beliefs on intention (Zhu *et al.*, 2010). On this basis, we hypothesize that:

H16. Attitude of RA is positively related to adoption intention.

Based on the theoretical framework and hypotheses discussed above, this study proposes an adoption model to investigate the possible reasons why consumers adopt a RA (Figure 2).

Research methodology

A 2014 survey of US consumers found that people who were most excited about the sharing economy once they had tried it were aged 18-24 years (PWC, 2015). Considering that early adopters of RA are mainly young people in large cities who are familiar with smart phones and have a requirement for ridesharing, a convenience sample was drawn from undergraduate students from a large university in Beijing to investigate the reasons why people adopt RA. The respondents participated in the study on a voluntary basis. To encourage participation, a small gift was provided to those who completed and returned the survey. While this is a convenience sample, the younger generations represent an important group of early adopters or potential users of RA. During September 2015, 350 paper-based questionnaires were distributed to college

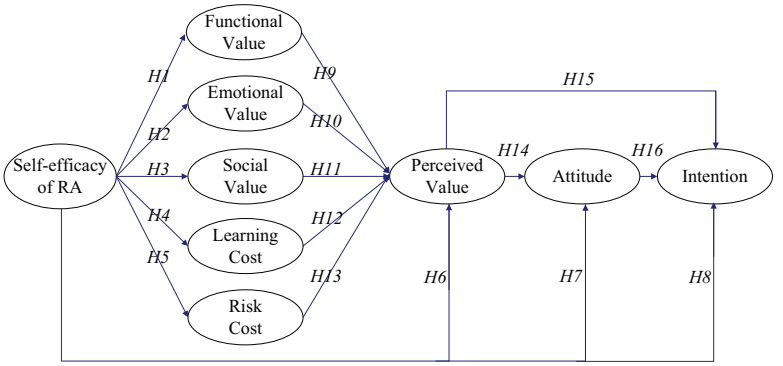

Figure 2.
Self-efficacy-based value adoption model and hypotheses

students in various campus locations. In total, 334 questionnaires were collected, 314 of which were valid with 20 removed due to substantial incompletion. Respondents averaged 20 years of age and were a good mix of men (46 per cent) and women (54 per cent). In terms of experience, 50 per cent of the respondents had used RA, whereas 47 per cent had no actual experience.

Instrument development

A survey instrument was developed to measure the constructs contained in the theoretical model. Measurement items were adapted from the relevant literature. Specifically, three items were adapted from Schwarzer *et al.* (1997) and Hsu and Chiu (2004) to measure self-efficacy of RA (e.g. I believe I have the ability to use a RA), and five items measuring functional value were borrowed from Davis (1989) and Sweeney and Soutar (2001) (e.g. using RA improves taxi performance). Three emotional value items (e.g. RA is an application that I would enjoy) and four social value items (e.g. using RA would give me social approval) were adapted from Sweeney and Soutar (2001). In addition, three items were adapted from Kleijnen *et al.* (2007) to measure learning cost (e.g. learning to use RA needs some effort), and four items from Featherman and Pavlou (2003) were used to capture risk cost (e.g. using RA subjects my online account to potential financial risk). Perceived value was measured using three items adapted from Sirdeshmukh *et al.* (2002) (e.g. Compared to the effort I need to make, using RA is worthwhile to me). Three items from Davis (1989) (e.g. I hold a positive attitude towards RA) and three items from Venkatesh and Davis (2000) (e.g. assuming I have used RA, I would continue to use it) were used to measure attitude and behavior intention, respectively. The survey was translated from English to Chinese and then back-translated to check for accuracy. For all the measures, a seven-point Likert type scale was used, with anchors ranging from strongly disagree (1) to strongly agree (7).

Analysis and results

Test of the measurement items

The research data were analyzed using partial least squares path modeling (PLS-PM). To ensure the properties of the instruments, the reliability and validity of the measurement model was examined before adopting the structural model. This was done using average variance extracted (AVE), Fornell's composite reliability (CR) and Cronbach's alpha (Chin, 1998; Fornell and Larcker, 1981). For all of the constructs, the AVE is greater than 0.5, and the CR and Cronbach's alpha are well above the cutoff value of 0.7 (Fornell and Larcker, 1981), demonstrating measurement reliability of the scales (Table II).

Construct	Items	Item mean	Factor loading	STDEV	T-Values	AVE	CR	Cronbach's alpha
Self-efficacy (SE)	SE1	5.96	0.910	0.017	52.785	0.748	0.898	0.824
	SE2	5.98	0.928	0.016	56.871			
	SE3	5.23	0.745	0.034	21.248			
Functional value (FV)	FV1	5.58	0.785	0.038	20.664	0.557	0.862	0.802
	FV2	5.36	0.730	0.044	16.515			
	FV3	5.24	0.695	0.046	15.368			
	FV4	4.86	0.726	0.042	17.497			
	FV5	5.58	0.789	0.022	34.533			
Emotional value (EV)	EV1	4.94	0.836	0.029	30.176	0.705	0.878	0.791
	EV2	4.56	0.821	0.035	24.181			
	EV3	4.53	0.861	0.026	31.694			
Social value (SV)	SV1	4.49	0.728	0.055	13.669	0.637	0.875	0.814
	SV2	3.92	0.839	0.035	23.616			
	SV3	4.70	0.858	0.029	29.641			
	SV4	3.59	0.760	0.052	14.546			
Learning cost (LC)	LC1	3.58	0.853	0.048	17.884	0.743	0.896	0.829
	LC2	3.74	0.891	0.038	23.694			
	LC3	3.49	0.841	0.051	14.884			
Risk cost (RC)	RC1	4.71	0.600	0.240	2.446	0.533	0.816	0.774
	RC2	4.56	0.920	0.279	3.343			
	RC3	4.59	0.635	0.248	2.525			
	RC4	4.42	0.724	0.229	3.217			
Perceived value (PV)	PV1	4.63	0.755	0.041	19.219	0.691	0.870	0.777
	PV2	4.74	0.878	0.017	49.759			
	PV3	5.34	0.854	0.017	45.324			
Attitude (AT)	AT1	5.40	0.862	0.024	36.484	0.804	0.925	0.877
	AT2	5.49	0.921	0.010	96.188			
	AT3	5.31	0.906	0.015	59.440			
Intention (IN)	IN1	5.26	0.867	0.030	26.735	0.832	0.937	0.896
	IN2	5.24	0.939	0.011	90.293			
	IN3	5.26	0.929	0.008	112.172			

Table II.
Results of measurement model

Validity checks ensured the convergent and discriminant validity of the measured constructs. Convergent validity was supported, as all loadings were significant (>0.50) (Anderson and Gerbing, 1988) and all AVEs were greater than 0.50 (Fornell and Larcker, 1981) (Table II). Following Fornell and Larcker (1981), a construct has adequate discriminant validity if the square root of AVE for the construct is greater than the variance shared between the construct and other constructs in the model. The correlations between each pair of constructs were lower than the square root of AVE for the relevant constructs (Table III), indicating discriminant validity. According to Hair *et al.* (2016), discriminant validity can also be established if all indicators' outer loading on the associated constructs were greater than all of its loadings on other constructs. Inspection of the results show that no items cross-loaded higher on another construct than they did on their own construct, furthermore supporting discriminant validity.

In addition to the classical approaches, Henseler *et al.* (2015) proposed an alternative reliable approach to assess discriminant validity – the heterotrait–monotrait ratio of correlations (HTMT). As Table III indicates, all values of HTMT are significantly below the threshold of 0.85 suggested in the literature (Clark and Watson, 1995; Henseler *et al.*, 2015;

Kline, 2011). This demonstrates the discriminant validity of the measured constructs. Thus, all measurement items were retained for further analysis.

Test of the structural model

Having established the reliability and validity of the data, this study used PLS-PM to test the proposed model and corresponding hypotheses using Smart PLS 3.0, an appropriate method given the sample size, the focus on each path coefficient and the focus on variance explained rather than the overall model fit (Chin *et al.*, 2003). The hypothesized model was estimated based on bootstrapping with 5,000 subsamples. Table IV presents the results of the hypothesized model, and Figure 3 provides a graphical depiction of the model. The results of the study show that 59 per cent of the variance in adoption intentions was

	SE	FV	EV	SV	LC	RC	PV	AT	IN
1. Self-efficacy(SE)	*0.863*	*0.454*	*0.313*	*0.175*	*0.398*	*0.093*	*0.555*	*0.603*	*0.569*
2. Functional value (FV)	0.374	*0.745*	*0.619*	*0.412*	*0.259*	*0.084*	*0.610*	*0.597*	*0.505*
3. Emotional value (EV)	0.256	0.503	*0.838*	*0.690*	*0.109*	*0.151*	*0.526*	*0.424*	*0.350*
4. Social value (SV)	0.150	0.339	0.544	*0.798*	*0.164*	*0.162*	*0.393*	*0.351*	*0.371*
5. Learning cost (LC)	−0.332	−0.229	−0.001	0.122	*0.860*	*0.317*	*0.148*	*0.282*	*0.263*
6. Risk cost (RC)	−0.073	−0.028	0.105	0.086	0.289	*0.730*	*0.099*	*0.148*	*0.142*
7. Perceived value (PV)	0.456	0.513	0.420	0.334	−0.109	−0.109	*0.829*	*0.712*	*0.670*
8. Attitude (AT)	0.514	0.513	0.355	0.321	−0.259	−0.146	0.599	*0.896*	*0.840*
9. Intention (IN)	0.491	0.439	0.298	0.340	−0.248	−0.138	0.569	0.746	*0.906*

Notes: Lower left diagonal is correlation matrix of latent variables; Diagonal elements are the square root of AVE; The HTMT is printed in upper right diagonal in italic

Table III.
Correlation matrix of latent variables with AVE and the HTMT ratio of correlations

Hypotheses	Path coefficients	STDEV	*T*-values	Hypothesis testing result
H1: SE → FV (+)	0.374***	0.062	6.037	Supported
H2: SE → EV (+)	0.256***	0.058	4.439	Supported
H3: SE → SV (+)	0.150*	0.072	2.074	Supported
H4: SE → LC (−)	−0.332***	0.059	5.599	Supported
H5: SE → RC (−)	−0.073	0.104	0.704	Rejected
H6: SE → PV (+)	0.309***	0.051	6.053	Supported
H7: SE → AT (+)	0.305***	0.054	5.594	Supported
H8: SE → IN (+)	0.145*	0.058	2.489	Supported
H9: FV → PV (+)	0.306***	0.055	5.549	Supported
H10: EV → PV (+)	0.143*	0.064	2.236	Supported
H11: SV → PV (+)	0.106*	0.053	1.991	Supported
H12: LC → PV (−)	0.087	0.061	1.432	Rejected
H13: RC → PV (−)	−0.127	0.090	1.401	Rejected
H14: PV → AT (+)	0.459***	0.049	9.431	Supported
H15: PV → IN (+)	0.165**	0.052	3.192	Supported
H16: AT → IN (+)	0.589***	0.060	9.850	Supported

Notes: SE = Self-efficacy; FV = Functional Value; EV = Emotional Value; SV = Social Value; LC = Learning Cost; RC = Risk Cost; PV = Perceived Value; AT = Attitude; IN = Intention; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table IV.
Results of the hypothesized structural model

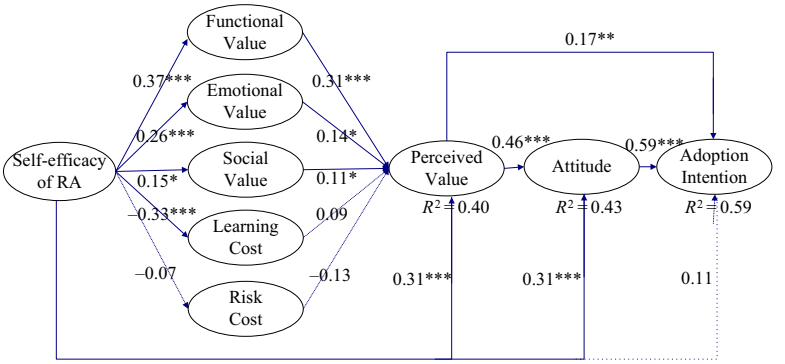

Figure 3.
The PLS-PM results

Notes: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; *Dotted line represents insignificant path*

explained by the model. With the exceptions of *H5*, *H12* and *H13*, all path coefficients were significant. Self-efficacy of RA was found to have strong effects on perceived value (especially functional and emotional value), learning cost and attitude, but no significant influence on intention. Perceived functional value has a significant effect on perceived value, perceived value strongly affects attitude and attitude dramatically influences adoption intention.

To assess the PLS-PM structural model, the effect size f^2 was evaluated to examine the predictive variable effects in the structural model with values of about 0.02, 0.15 or 0.35 indicating that the exogenous latent variable has a small, medium or large effect on the endogenous latent variable, respectively (Hair *et al.*, 2016). In this study, results indicate that perceived value has a strong effect on attitude ($f^2 = 0.29$), and attitude has a strong effect on adoption intention ($f^2 = 0.48$); whereas self-efficacy has medium impact on perceived functional value, learning cost, perceived value and attitude ($f^2 = 0.16$, 0.12, 0.12 and 0.13, respectively). All the other significant paths have small effect on their dependent latent variables.

The blindfolding procedure was used to generate the cross-validated redundancy measure Q^2 (Stone-Geisser test), which offers evidence that the proposed model has predictive relevance with a threshold value larger than zero for all the valid exogenous variables (Hair *et al.*, 2016). As all Q^2 values well exceeded zero, the results provide strong evidence indicating the predictive ability of the hypothesized theoretical model.

Discussion and conclusions

Theoretical implications

The study provides important theoretical implications for innovation adoption research through an empirical examination of the relationship between personal, environmental, and behavioral determinants in a framework of SCT. The principal contribution is an examination of the assertion by Bandura (2012) that self-efficacy is a focal determinant and strongest predicator to directly and indirectly influence behavior determinants. The results indicate that self-efficacy does indeed have a salient positive effect on perceived benefits, which suggest that the greater one has self-efficacy belief, the much more value is perceived. Self-efficacy also has a noteworthy influence on perceived learning cost, which confirms that

the confidence in one's ability to use RA could decrease one's barrier of learning effort. It should be noted that self-efficacy does not directly influence behavior intention, whereas self-efficacy exerts an effect on adoption intention through attitude as well as perceived value of RA. These results are similar to those of Faqih (2013) who found that self-efficacy has no direct significant impact on consumers' intention to shop online, but has an indirect influence on consumers' intentions through intermediating factors.

The finding that functional value is the essential and prominent variable confirms that RA is useful for users to accomplish a riding task and is the salient motivation for adoption (Dredge and Gyimóthy, 2015). In addition, the emotional and social values of RA are compelling factors, demonstrating that intrinsic affective motivation and extrinsic social requirement cannot be ignored for adoption. The results are consistent with those of PWC (2015) which found that the majority of consumers agree that the sharing economy makes life more convenient and efficient, provides more fun and builds a stronger community. The results are also consistent with the VAM, showing a relationship between functional, emotional, social value and perceived value (Turel *et al.*, 2010; Yang *et al.*, 2016; Chen and Lin, 2015; Zhu *et al.*, 2010; De Kerviler *et al.*, 2016). The assumptions that learning and risk costs negatively affect overall value perception of RA are not supported, which indicate that learning effort and possible risk of RA are not conspicuous barriers for users to evaluate the value of RA. So for the early adopters or potential young adopters, there are many more perceived benefits than perceived costs for the value of RA.

Last but not least, the relationship between value and behavioral determinants is confirmed in this study. Perceived value not only strongly impacts attitude but also significantly influences adoption intention. Although adoption intention has no direct relationship with self-efficacy, the antecedents of perceived value and attitude are jointly influenced by self-efficacy.

Practical implications

The study also has important practical implications. The explosion of the internet and its associated digital technologies since the turn of the century has disrupted almost every field of human endeavor, and transformed the way we plan, book and experience travel. Botsman and Rogers (2010) suggest that collaborative consumption could be as important as the Industrial Revolution in terms of how we think about ownership. Every day, creative entrepreneurs are dreaming up the next internet startup to leverage this phenomenon. As Belk (2014) suggests, against this backdrop it would be folly to ignore sharing and collaborative consumption as alternative ways of consuming and as new business paradigms. It is therefore critical that those businesses in the sharing economy understand consumer motivations behind technology adoption.

What this study has confirmed is that functional usefulness is the fundamental value for consumers in adopting RA. Convenience and cost-effectiveness should therefore be emphasized during the process of system development, business design and marketing. But as Wallsten (2015) has suggested, consumers value other aspects of RA. As with peer-to-peer accommodation platforms, the value of emotional enjoyment and social identification, for example, are appealing to users of RA and should therefore be stressed in marketing materials.

The results of this study could also be used by practitioners outside of the sharing economy, who have been left behind by this disruptive innovation (Karlsson and Dolnicar, 2016). Traditional tourism providers in the transportation and accommodation sectors, for example, could compete with the sharing economy by improving their functionality, and by making more of an emotional/social connection with customers. Wallsten (2015) has suggested that

traditional taxi companies may be encouraged to improve their own services in response to the new competition, by, for example, making sure their cars are clean, running the air conditioner in the summer, talking to the customer and not a cellphone and ensuring credit card readers are operable. Similarly, traditional accommodation providers may attempt to improve their services and provide a more authentic and social experience. Marriott, for example, have developed their Six Degrees application (developed by MIT's Mobile Experience Lab) that allows guests staying at the same hotel to connect and make the hotel lobby more of a social gathering place. However, Richard and Cleveland (2016) and Möhlmann (2015) argue that rather than competing with the sharing economy, hotels and transportation companies might be better off extending their brands to include peer-to-peer rentals. The Avis group, for example, recently diversified by acquiring the car sharing company Zipcar.

The results also suggest that perception of learning cost has no significant influence on perceived value of RA for young people, and that perceived risk does not significantly impact the overall perceived value of RA. The possible reasons are that early adopters of new technology are more willing to take risks (Rogers, 2010), or that RA has built a trustworthy evaluation mechanism and security transaction system (Hamari *et al.*, 2015). Regardless, the knowledge that perceived risk of RA is not a significant barrier for users allows practitioners in the sharing economy to strategically manage user relationships and develop targeting marketing strategies when planning to increase the number of users and engage groups beyond the younger generation (Möhlmann, 2015).

Limitations and future research

As with all studies there are limitations that could be addressed in future research. First, the sample is college students from China, and therefore the results may not be generalizable. While the demographic profile of the sample is consistent with typical users of RA, the convenience sample of students may also affect the validity of the results as well as produce unrepresentative findings. Although learning cost and risk cost do not have a significant influence on perceived value of RA in this study, the results may be different with other demographics. For potential users, especially for older populations and non-smart phone users, learning effort could be a critical intangible cost. Likewise, performance risk, financial risk, physical risk, legal risk and privacy risk may be barriers for different groups of consumers.

The study was also limited to RA, whereas future research could examine technology adoption in other sharing economy platforms. In the tourism and hospitality sector these are plentiful. On the lodging side, Airbnb, CouchSurfing and HomeAway are big players, and the food and dining industry is catching up. For example, Feastly connects diners with chefs offering unique food experiences outside of restaurants, while EatWith links diners and hosts, creating a social experience where guests get to know one another over a locally authentic, home-cooked meal. Finally, future research could investigate how these factors affect each other across various stages such as the before-adoption stage and the after-adoption stage, further advancing our understanding of technology acceptance within the domain of the sharing economy.

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