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How social distance affects the intention and behavior of collaborative consumption: a study based on online car-hailing service

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Keywords

Collaborative consumption, Online car hailing, Social distance, Theory of Planned Behavior

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Conflict of Interests

None

Abstract

In recent years, advances in mobile communications technology have enabled collaborative consumption or product sharing between consumers on a large scale. Unlike traditional consumption, collaborative consumption is based on collaboration among individuals, so that the decision-making mechanisms of individual consumers may be different from those in traditional consumption scenarios. The current study focuses on how the social distance between consumers and drivers affects collaborative consumption intention in the case of online car-hailing services. In this study, the theory of planned behavior (TPB) is used as the foundational framework, and we innovatively add the concept of social distance to the TPB to form a new, and integrated model. We test the model based on data collected from 315 online car-hailing users. The results shows that behavioral attitudes, subjective norms, and perceived behavioral control, positively influence collaborative consumption intention and behavior. More interestingly, we find that social distance has both direct and indirect impacts on collaborative consumption intention: The greater the social distance, the lower the collaborative consumption intention. Moreover, social distance also moderates the influence of subjective norms and perceived behavioral control on collaborative consumption intention. To be specific, the influence of subjective norms and perceived behavioral control on collaborative consumption intention is weakened when consumers perceive less social distance. The results suggest that the integrated model has a stronger explanatory power on collaborative consumption behavior. This study enhances the traditional TPB model and offers insight into promoting collaborative consumption in the context of the sharing economy.

Keywords: Collaborative consumption, Online car-hailing, Social distance, Theory of Planned Behavior

1. Introduction

China's sharing economy has experienced explosive growth in recent years. An investigation conducted by the State Information Center revealed that China's sharing economy reached 3,282.8 billion yuan in 2019, and will grow by approximately 40% in the next few years (SIC, 2020). The collaborative consumption model could explain the sharing economy. By using mobile internet and information technology, consumers can share idle resources, such as products and houses, and provide various services such as travel and knowledge-sharing services. The essence of the sharing economy is collaborative consumption, and the two concepts are considered to be conceptually identical in the literature (Belk, 2014). Collaborative consumption, which involves collaboration between two or more consumers through a platform, is significantly different from traditional consumption, which can be undertaken independently by individuals (Benoit et al., 2017). Voluntary cooperation among individuals, through social networks, is the premise of collaborative consumption. Schor and Fitzmaurice (2015) suggest that three important attributes of the sharing economy are the willingness and ability of strangers to share, high dependence on digital technology, and people's active participation. Thus, collaboration becomes the decisive determinant of the success of the sharing economy. Such cooperation can be interpreted as sharing behavior among consumers. As a result, consumers may exhibit different consumption decision-making mechanisms under such new consumption scenarios (Han et al., 2007; Mizerski et al., 1979), and these topics have not been sufficiently and robustly explored in the existing literature.

Previous research on consumer decision-making is well established, and the theory of planned behavior (TPB) is one of the most dominant theories in behavioral research (Conner & Armitage, 1998; George, 2004b). However, we argue that TPB is not sufficient to explain consumers' consumption behavior in the collaborative consumption scenario. TPB is focused on the influence of consumers' internal behavioral attitudes, perceived behavioral control, and external subjective norms on behavioral intention and behavior. However, it ignores social

factors such as the interrelationships (e.g., perceived social distance) between collaborated consumers, which are important factors in collaborative consumption. In sharing economy research, social distance is considered as one of the most important factors influencing the willingness to share. For instance, a close social distance has been shown to increase individuals' willingness to share their belongings (Schreiner et al., 2018), their information and experience through social media (Tran et al., 2011), and their word-of- mouth intentions (Yang, 2019). Although such sharing behavior is not the same as in collaborative consumption, it is believed that social distance is still an important determinant of consumption behavior in collaborative consumption (Belk, 2014).

Previous research has examined the motivational and influencing factors of collaborative consumption, but little attention has been paid to the cooperative relationship and interaction psychology between participants in collaborative consumption. Therefore, this study aims to (1) integrate the concept of social distance with TPB to explore the determinant factors of collaborative consumption behavior; (2) explore the effect of social distance on the collaborative consumption intention and the underlying mediating mechanism; and (3) investigate the moderation effect of social distance on the relationship between subjective norms and collaborative consumption intention, as well as the relationship between perceived behavioral control and collaborative consumption intention. In achieving these research objectives, this study makes unique contributions to collaborative consumption research by integrating social distance with TPB to explain consumers' collaborative consumption behavior. As online car-hailing services are the most representative collaborative consumption mode, this study takes the online car-hailing services platform as its research object.

The study is organized as follows. In the next section, we review the literature related to collaborative consumption, online car-hailing service, and social distance. Then, we propose a series of hypotheses with support from the extant literature. This is followed by our research methods, including a description of our questionnaire development and data collection approaches and our sample's characteristics. We then report the results of our statistical analysis and provide a discussion of the results. Finally, we articulate the study's theoretical and managerial implications and limitations, and outline avenues for future research.

2. Theory

2.1. Collaborative consumption and online car-hailing services

The term collaborative consumption was first introduced by Felson and Spaeth (1978) in their groundbreaking research and was then systematically elaborated by Bozman and Rogers (2016). Since then, several scholars have examined the development characteristics of collaborative consumption in different countries. For example, Wang (2013) conducts a comparative study on collaborative consumption between China and the United States in terms of development history, business models, and consumer influence, and developed specific strategies to promote the development of China's collaborative consumption. Collaborative consumption leads to a shift away from the exclusive ownership and consumption of resources to shared use and consumption. Benjaafar et al. (2019) describe an equilibrium model of collaborative consumption. Their findings indicate that collaborative consumption can result in either lower or higher ownership and usage levels, with higher ownership and usage levels more likely when the cost of ownership is high That is, consumers always benefit from collaborative consumption.

Scholars have also examined the factors affecting collaborative consumption from different perspectives. For example, from the perspective of product disposal, the stronger the

emotional attachment to products, the less willing consumers are to dispose of them by means of collaborative consumption (Yang & Deng, 2014). Through a survey of 752 Finnish consumers, Lindblom et al. (2018) conclude that materialism is negatively related to consumers' attitudes towards collaborative consumption. The online survey of collaborative consumption attitudes and conscious consumption reveal that there is a level of coherence between attitudes of collaborative consumption and conscious consumption, primarily in three dimensions: Social identity, socio-environmental consciousness, and trust (Lindblom et al., 2018; Lu et al., 2018). Moreover, different usage periods also have an impact on collaborative consumption. In a period with low self-use value, the consumer may generate some income by renting out their purchased product through a third-party sharing platform, if the net rental fee after transaction costs exceeds their self-use value (Jiang & Tian, 2018).

In the field of collaborative consumption, the online car-hailing service industry has developed rapidly in recent years. Evidently, this industry has contributed to reducing environmental pollution and traffic congestion (Efthymiou et al., 2013; Martin et al., 2010; Wu et al., 2018). The intention of using an online car-hailing service has been extensively researched. In addition to external factors, such as service characteristics (e.g., price and service quality), it was found that users' trust in an online car-hailing platform is positively correlated with their trust in drivers (Sun & Elefteriadou, 2011), and this combined trust positively influences the intention to use this service (Wang & Chen, 2017). Differences in personal psychological ownership will also affect the impact of instrumental car attributes (e.g., price, parking convenience, and car type) on users' intention to use online car-hailing. For example,

low psychological ownership may lead to a higher preference for shared cars under certain circumstances (Paundra et al., 2017).

2.2. Social distance

Social distance is defined as the degree to which an individual perceives a lack of intimacy with individuals who differ in ethnicity, race, religion, occupation, or other variables (Park, 1924). It is also believed that social distance describes the degree of emotional intimacy and closeness of individuals in society, reflecting the similarity and familiarity between self and others (Gordon, 1998; Liberman & Trope, 2014).

Social distance belongs to the category of psychological distance (Trope & Liberman, 2010). People conflate different types of psychological distance—spatial, social, and temporal. They use the same neural systems for thinking about events across all three types of distance (Buckner & Carroll, 2007; Spreng et al., 2009; Tamir & Mitchell, 2011). For example, it was found that perceptions of social distance are similar to perceptions of spatial distance; the more socially distant the participant reported feeling from their conversational partner, the further they estimated themselves to be from their partner's current city (Won et al., 2018). It appears that social distance affects an individual's intention and behavior directly. Lower perceived social distance has been proved to be positively related to product-purchase intention (Lin & Xu, 2017). Social distance can also affect consumers' psychological sense of belonging to social media platforms, thus affecting their participation (Kwon, 2020). Furthermore, the social distance between consumers and social media influencers is positively related to their broadcasting intention on live streaming platforms (Zhou et al., 2019). In addition, social

distance has a moderating effect on behavior and intention. For example, corporate social responsibility (CSR) practices may influence consumers' pro-social behavior, and this influence depends on a company's motivation for CSR, which is moderated by the consumer–brand social distance (Mantovani et al., 2017).

To sum up, qualitative and quantitative studies have investigated the connotation, mode, characteristics, influencing factors, and behavioral motives of collaborative consumption. However, previous studies have paid less attention to the interaction psychology and perception of individuals involved in collaborative consumption. Therefore, this study focuses on participants in collaborative consumption and the influence mechanism of social distance with the three TPB factors – internal behavioral attitudes, perceived behavioral control, and external subjective norms – on individual collaborative consumption intention and behavior. Social distance, as an important psychological factor, also influences consumer behavior. In collaborative consumption, the influence of social distance on such consumption behavior is more important because it involves the consumption interaction and social interaction between two or more parties.

2.3 Conceptual framework and hypotheses

The theory of planned behavior was proposed by Ajzen (1991), based on the theory of reasoned action. According to TPB theory, behavioral intention determines actual behavior. Behavioral attitude, subjective norms and perceived behavioral control jointly affect behavioral intention. Perceptual behavior control also directly affects behavior. In consumer behavior research, TPB is widely used because it is highly effective in predicting consumers' behavioral

intentions. Therefore, this study applies TPB to shed light on the antecedent factors of collaborative consumption behavior.

Although TPB can be helpful in studying the intention and behavior of individual consumers, cooperation and interaction with other participants should also be considered in the context of collaborative consumption. Etang et al. (2011) demonstrate that individuals in cooperation not only care about their own interests but also others' interest and action intentions. Therefore, certain social preferences (e.g., altruism, dedication, fairness, and mutual benefit) will be revealed in economic decision-making, and social distance perception will affect individuals' social preferences. Therefore, this study adds social distance variables into the TPB model in the belief that social distance, together with behavioral attitude, subjective norms, and perceived behavioral control, influence collaborative consumption intention and behaviors.

On the one hand, individuals' perceptions of social distance in collaborative consumption influence their behaviors and attitudes (Li & Xia, 2009). Hence, it was suggested that the more tightly-knit the society is, the higher is the level of mutually beneficial cooperation (Liberman et al., 2007). Therefore, this study posits that social distance has a significant positive impact on behavioral attitude and further affects collaborative consumption intention. Smaller social distance can promote collaborative consumption intention, and behavioral attitudes mediate the relationship between social distance and collaborative consumption intention.

On the other hand, it was proposed that social distance also affects risk perception and, consequently, affects perceptual behavior control (Chandran & Menon, 2004). Garpenter and Matthews (2002) have found that social distance affects social identity, which in turn, affects individual subjective norms. Therefore, this study proposes that although social distance does not directly affect the formation of subjective norms and perceived behavioral control, it can

moderate the influence of perceived behavioral control and subjective norms on collaborative consumption intention.

Therefore, we propose the following model in the context of online car-hailing services (Fig. 1). In this model, the two participants of collaborative consumption, the driver and the passenger, fulfill the car-hailing service model through an online platform such as Didi or Uber.

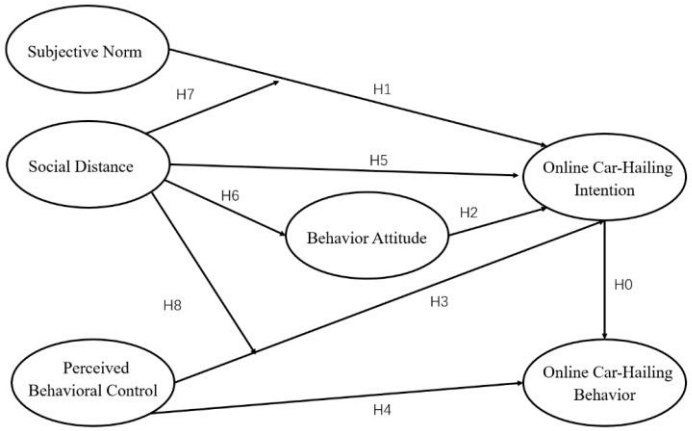

Fig. 1. The research model

The proposed hypotheses are as follows:

H0: Online car-hailing intention positively influences online car-hailing behavior.

H1: Subjective norms positively influence online car-hailing intention.

H2: Behavioral attitudes positively influence online car-hailing intention.

H3: Perceived behavioral control positively influences online car-hailing intention.

H4: Perceived behavioral control positively influences online car-hailing behavior.

H5: Social distance negatively influences online car-hailing intention, the greater the perceived social distance, the lower the online car-hailing intention.

H6: Behavioral attitudes mediate the relationship between social distance and online car-hailing intention.

H7: Social distance moderates the relationship between subjective norms and online car-hailing intention. The positive influence of subjective norms on online car-hailing intention weakens as social distance decreases.

H8: Social distance moderates the relationship between perceived behavioral control and online car-hailing intention. The positive influence of perceived behavioral control on online car-hailing intention weakens as social distance decreases.

3. Methodology

3.1 Variable measurement

Behavioral attitudes refer to the positive or negative opinions held by individuals based on expected results of a behavior, as measured by three items adapted from George (2004a). Subjective norms refer to the social pressure individuals feel about whether to take a particular action, as measured by three items adapted from Taylor and Todd (1995). Perceptual behavioral control refers to individuals' degree of control when performing or not performing a certain behavior, as measured by three items adapted from Taylor and Todd (1995). The variable measurements are shown in Table 1.

Table 1. Measurement of variables

Factors	Measurement Items	Scholars
Behavioral attitudes	A1. I think the consumption is a good idea A2. I think the consumption is favorable A3. I think the consumption is a wise choice	(George, 2004a)

	B1. People around me think it is wise for me to consume like this	
Subjective norms	B2. People around me think it is helpful for me to consume like this	(Taylor & Todd, 1995)
	B3. People around me think it is worthwhile for me to consume like this	
Perceived behavioral control	C1. This consumption is entirely within my control	(Taylor & Todd, 1995)
	C2. I have the knowledge and ability to complete the consumption activities	
	C3. I would be able to consume like this	
Online car-hailing intention	D1. I would like to recommend this way of consumption to others	(Gefen et al., 2003)
	D2. I am willing to consume again	
	D3. I am willing to provide some personal information to promote consumption	

A 5-point Likert scale was used to measure behavioral attitudes, subjective norms, perceived behavioral control, online car-hailing intention, and online car-hailing behavior. Social distance is mainly referred to the psychologically perceived distance between individuals and other collaborative consumers (e.g., the drivers in the car-hailing service). We adopt the interpersonal relationship intimacy scale developled by Aron et al. (1991) to proxy Social distance, with regard to the perceived intimacy between individuals and drivers. This scale uses the overlap degree of two circles to reflect the degree of intimacy between the individual and the driver. Respondents' choices are scored from 1 (completely non-overlapping) to 7 (almost completely overlapping). The higher the score, the higher the perceived intimacy degree and the less the perceived social distance. This scale is widely used to evaluate the intimacy between respondents and others. In this study, we use focus group interviews to test

whether two circles with different overlapping degrees can accurately measure intimacy (Sun & Elefteriadou, 2011), that is, the accuracy of each participant's answer (see Appendix A).

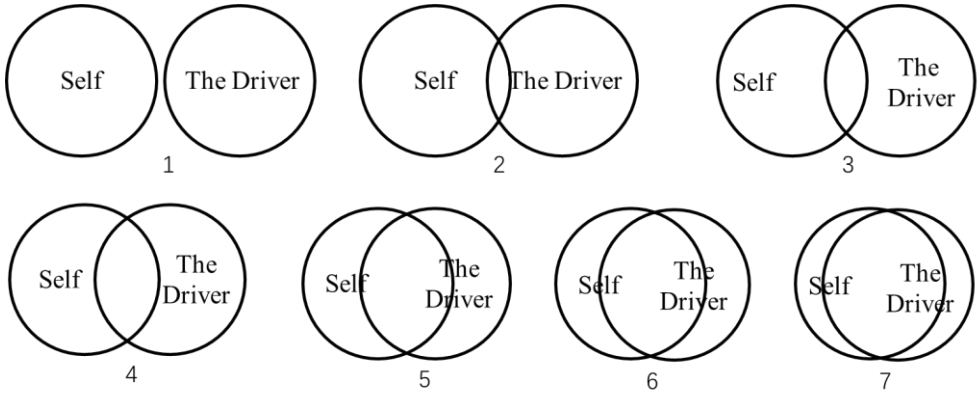

Fig. 2. The measurement of social distance

3.2 Data collection

After completing the questionnaire design, a preliminary survey was conducted among 50 students in a university. According to the results of the preliminary survey, the expressive questions, such as inappropriate, semantic ambiguity, and guided responses, were modified, and the question items with low reliability were deleted. Subsequently, a formal questionnaire survey was conducted. In this study, 100 questionnaires were distributed offline and 250 questionnaires were distributed online. At the same time, respondents were invited to complete the questionnaires through email, WeChat, and other platforms. A total of 340 valid questionnaires were collected, and incomplete questionnaires, questionnaires with repeated IP addresses, and questionnaires with less than 1-minute filling time were excluded. As a result, with an effective rate of 92.6%, 315 valid questionnaires were obtained. The respondents were geographically distributed as follows: 93 in Shanghai, 84 in Beijing, 68 in Guangdong, 25 in

Zhejiang, 24 in Sichuan, and 21 in Hubei. Since the research sample covers provinces and municipalities with considerable economic development and large numbers of ride-sharing users, it is considered that the research sample is adequately representative.

Descriptive statistics of the sample are shown in Table 2.

Table 2. Demographic description of participants

Demographic variable		N	%
Gender	Male	143	45.4%
	Female	172	54.6%
Age (years)	Under 19	75	23.8%
	20–29	93	29.5%
	30–39	74	23.5%
	40 and above	73	23.2%
Education	Junior high school and below	1	0.3%
	High school/technical secondary school/technical school	36	11.4%
	Junior college	48	15.3%
	Undergraduate	208	66.0%
	Master's/PhD	22	7.0%

4. Results

4.1 Reliability and validity analysis

We perform a confirmatory factor analysis (CFA) to assess the validity and reliability of the constructs (see Table 3). The goodness-of-fit indicator of the CFA model exhibits an acceptable

fit ($\chi 2$/df = 1.343, CFI = 0.995, TLI = 0.994, RMSEA = 0.033). All factor loadings are above 0.7, confirming that the items are valid measures of the underlying construct. Next, the average variance variation (AVE) of all variables are greater than 0.5, and the combined reliability (CR) are greater than 0.8, indicating an ideal polymerization validity. In addition, the square root of the AVE value of each variable (value on the diagonal) is greater than the correlation coefficient of this variable and other factors (value on each column under the diagonal), indicating a good discriminant validity of the scale.

Table 3. Reliability and validity analysis

	AVE	**CR**	**BA**	**SN**	**PBC**	**OCI**
BA	0.7858	0.9167	**0.886**			
SN	0.8732	0.9536	0.137***	**0.934**		
PBC	0.8519	0.9451	0.176***	0.211***	**0.923**	
OCI	0.7292	0.8897	0.205***	0.173***	0.226***	**0.854**

Note：***p <.001. BA: behavioral attitudes, SN: subjective norms, PBC: perceived behavioral control, OCI: online car-hailing intention.

4.2 Structural equation model

To study the influence of behavioral attitudes, subjective norms, perceptual behavioral control, and social distance on online car-hailing intention and online car-hailing behavior, we use AMOS24.0 software to further analyze the path of structural equation of the subject model based on TPB. Meanwhile, to prove that the TPB model with social distance has a stronger explanatory power for collaborative consumption behavior, we divide the model validation into

two steps: Five-factor model (without social distance) and six-factor model (with social distance). In this study, the six-factor model is the proposed research model.

For the six-factor model, AMOS path analysis reveals that the chi-square value of the overall fitness of the model is 4.045, the probability of significance P = 0.257 > 0.05, and the chi-square freedom ratio is 1.348, which is between 1 and 3, indicating that the fitness of the model is good. RMSEA value is less than 0.05, and GFI, AGFI, NFI, TLI, IFI, and RFI equivalent are greater than 0.900 (Table 4). This shows that the survey data could be adapted to the TPB-based consumption behavior model of shared economy proposed in this study, and the hypothesis model could be supported. In addition, the results of path analysis showed that the significant level of each path coefficient is $p < 0.05$. Therefore, the research assumes that H0, H1, H2, H3, H4, and H5 are verified.

For the five-factor model, CFI, NFI, TLI, IFI, and RFI are all above 0.9, and RMSEA value is less than 0.05, indicating that the fitting degree of the model is also relatively good. Moreover, after adding the social distance variable, the fitness statistical value increased, and the residual value decreased, indicating that the fitness degree of the model is better after adding the social distance variable (see Table 5). Therefore, the TPB model with social distance has a stronger explanatory power for collaborative consumption behavior.

Table 4. Path estimates for the proposed model

Path	Estimate	S.E.	C.R.	P
Online car-hailing intention < Behavior attitude	0.132	0.054	2.468	0.014

Path	Estimate	S.E.	C.R.	P
Online car-hailing intention < Subjective norm	0.172	0.063	2.711	0.007
Online car-hailing intention < Perceived behavioral control	0.255	0.058	4.369	***
Online car-hailing intention < Social distance	0.169	0.026	6.577	***
Online car-hailing behavior < Perceived behavioral control	0.213	0.097	2.199	0.028
Online car-hailing behavior < Online car-hailing intention	0.394	0.098	4.005	***
Proposed model fit				
χ^2/df = 1.348，GRI = 0.995，AGFI = 0.994，NFI = 0.988，TLI = 0.977，IFI = 0.997, RFI = 0.917, RMSEA = 0.033				

Note: * * * P < 0.001

Table 5. Comparison of fitting indexes of the two models

Model	CMIN/DF	CFI	NFI	TLI	IFI	RFI	RMSEA
Five-factor model	1.554	0.995	0.987	0.963	0.997	0.902	0.042
Six-factor model	1.348	0.995	0.988	0.977	0.997	0.917	0.033

Note: Five-factor model: behavioral attitudes, subjective norms, perceived behavioral control, online car-hailing intention, online car-hailing behavior; Six-factor model: behavioral attitudes, social distance, subjective norms, perceived behavioral control, online car-hailing intention, online car-hailing behavior

4.3 Mediating effect analysis

To verify the mediating effect of behavioral attitudes between social distance and online car-hailing intention, the bootstrap analysis method is adopted based on the mediating effect analysis method proposed by Preacher and Hayes (2004). The sample size is 5000, and the

main effect is significant at 95% confidence level. After controlling for the mediating effect, the influence of social distance on online car-hailing intention becomes significant (LLCI = 0.1393, ULCI = 0.2458), and the direct effect is 0.1926. Meanwhile, the analysis results of indirect effect show that the confidence interval does not contain 0, indicating a significant mediating effectof 0.0467 (LLCI = 0.0262, ULCI = 0.0730). These results conclude that behavioral attitudes partially mediate the relationship between social distance and online car-hailing intention, in support of H6(see Table 6).

Table 6. Results of bootstrap analysis

	Effect	**SE**	**t**	**Prob.**	**Confidence Intervals**	
					LICI	**ULCI**
Direct effect	0.1926	0.0271	7.1168	.0000	0.1393	0.2458
Indirect effect	0.0467	0.0117			0.0262	0.0730

4.4 Moderating effect analysis

To test the moderating effects of social distance on the impact of subjective norms on online car-hailing intention, as well as the moderating effects of social distance on the impact of perceived behavioral control on online car-hailing intention, SPSS21.0 is used for hierarchical regression analysis after the variables have been centralized. The analysis results are presented in Table 7. The R-square of the regression model gradually increased, and the coefficients of the product terms of Model 3 and Model 6 are significant ($P < 0.05$), indicating that the adjustment effect of social distance is significant, and hypotheses H7 and H8 are verified.

Table 3. Results of hierarchical regression analysis

Model		Coefficient test			Equation test		R^2
		B	T	Sig.	F	Sig.	
1	Subjective norms	0.347	6.551	.000	42.921	.000[a]	0.121
2	Subjective norms	0.261	5.354	.000	62.893	.000[b]	0.287
	Social distance	0.417	8.554	.000			
3	Subjective norms	0.666	6.551	.000	51.109	.000[c]	0.330
	Social distance	1.753	5.784	.000			
	Social distance × Subjective norm	−1.488	−4.463	.037			
4	Perceived behavioral control	0.419	8.157	.000	66.533	.000[a]	
5	Perceived behavioral control	0.320	6.634	.000	72.748	.000[b]	
	Social distance	0.390	8.081	.000			
6	Subjective norms	0.707	7.157	.000	58.011	.000[c]	
	Social distance	1.507	5.900	.000			
	Social distance × Perceived behavioral control	−1.286	−4.447	0.037			

Note: Dependent variable: Online car-hailing intention

It can be seen from the moderating effect diagram that social distance moderates the relationship between subjective norms and online car-hailing intention (Fig. 3). Furthermore, the greater the social distance, the stronger the subjective norms of consumers and the willingness of collaborative consumption. In contrast, excessively strong subjective norms will reduce people's willingness for collaborative consumption with a closer social distance.

Therefore, social distance is found to negatively moderate the effect of subjective norms on online car-hailing intention; as social distance decreases, the positive impact weakens.

Similarly, from the interaction diagram, we show that social distance moderates the relationship between perceived behavioral control and online car-hailing intention (Fig. 4). The perceived behavioral control of consumers and the willingness for collaborative consumption become stronger with a far social distance, but excessively strong perceived behavioral control will reduce people's willingness for collaborative consumption when the social distance decreases. Therefore, social distance is found to negatively moderate the effect of perceived behavioral control on online car-hailing intention; as social distance decreases, the positive impact weakens.

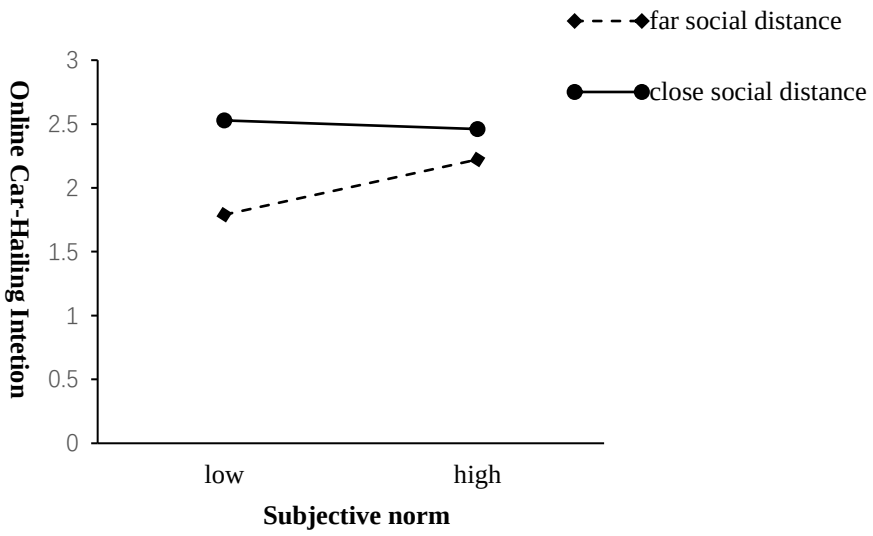

Fig. 3. The moderating effect of social distance on the relationship between subjective norm and online car-hailing intention

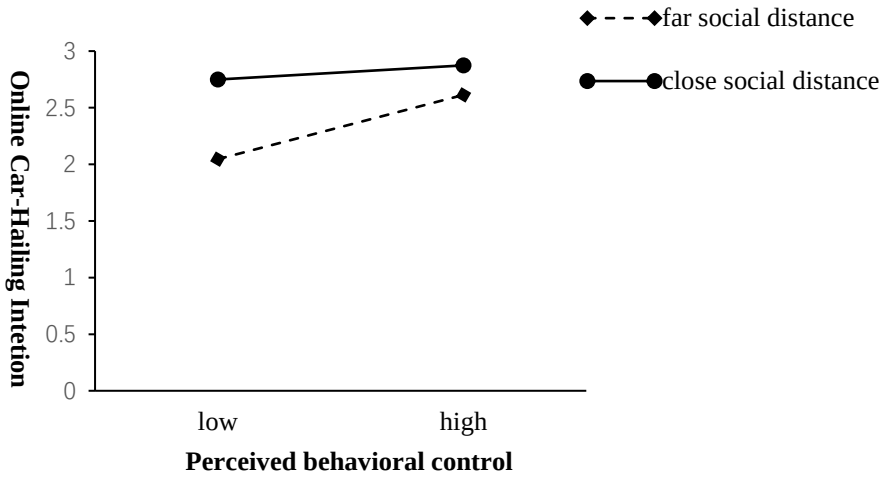

Fig. 4. The moderating effect of social distance between perceived behavioral control and collaborative consumption intention

The analysis results of the research model are shown in Fig. 5.

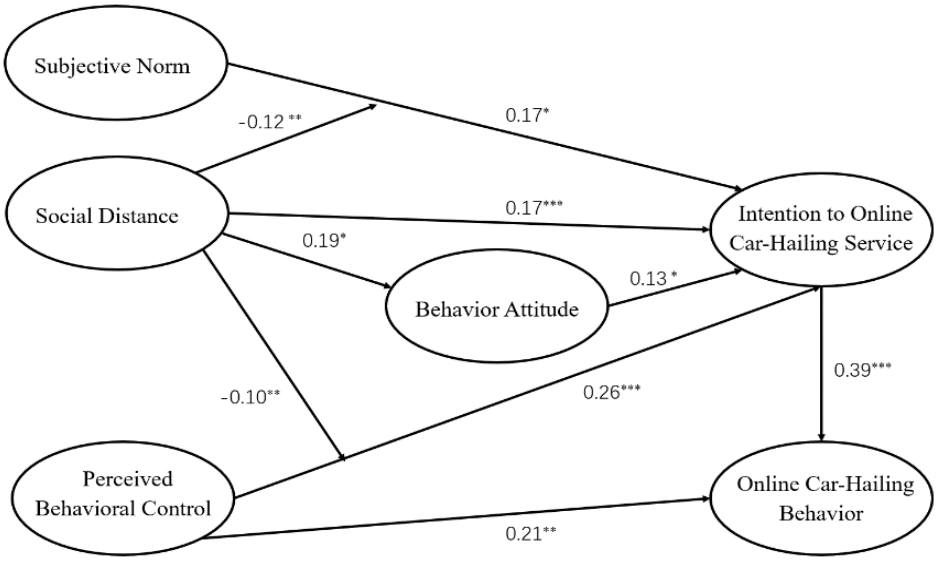

Fig. 5. Model analysis results

The empirical study confirms the hypotheses, and the results are presented in the following table.

Table 4 Results of hypothesis testing

Hypothesis		Results
H0	Online car-hailing intention positively influences online car-hailing behavior.	Supported
H1	Subjective norms positively influence online car-hailing intention.	Supported
H2	Behavioral attitudes positively influence online car-hailing intention.	Supported
H3	Perceived behavioral control positively influences online car-hailing intention.	Supported
H4	Perceived behavioral control positively influences online car-hailing behavior.	Supported
H5	Social distance negatively influences online car-hailing intention.	Supported
H6	Behavioral attitudes moderate the relationship between social distance and online car-hailing intention.	Supported
H7	Social distance moderates the relationship between subjective norms and online car-hailing intention.	Supported
H8	Social distance moderates the relationship between perceived behavioral control and online car-hailing intention.	Supported

5. Discussion

5.1. Theoretical implications

Our findings make a three-fold contribution to the existing literature. First, the research demonstrates that TPB with social distance has a stronger explanatory power for online car-hailing intention and behavior. Social distance, together with subjective norms, perceived behavioral control, and behavioral attitudes, significantly and positively influence online car-

hailing intention and behavior. Perceived behavioral control has the greatest (and a direct) impact on online car-hailing intention and behavior.

Second, we show that social distance has the greatest effect on collaborative consumption intention. Particularly, the less the perceived social distance, the higher the collaborative consumption intention, and behavioral attitude partially mediates this influence. In other words, when consumers perceive less social distance from another consumer, their behavioral attitudes tend to be positive, and they are more likely to accept online car-hailing services. Hence, they will increase their online car-hailing intention. In contrast, consumers will be less willing to accept online car-hailing services when they perceive greater social distance. In this process, behavioral attitudes mediate the relationship between social distance and online car-hailing intention.

Third, social distance plays a moderating role in the impact of subjective norms and perceptual behavioral control on online car-hailing intention. According to our empirical results, social distance negatively moderates the impact of subjective norms on online car-hailing intention; as social distance reduces, the positive impact of subjective norms on online car-hailing intention weakens. Similarly, social distance is found to negatively moderate the effect of perceived behavioral control on online car-hailing intention; as social distance decreases, the positive impact of perceived behavioral control on online car-hailing intention weakens. Overall, the results show that the three determinants of behavioral intention proposed in traditional TPB still have the greatest effect on collaborative consumption intention in the

new consumption context. However, subjective norms and perceived behavioral control do not appear to be influential factors when the perceived social distance is less. This result suggests that traditional TPB is not sufficient to explain consumers' collaborative consumption intention under certain circumstances (e.g., less social distance). One of the possible explanations is that TPB is based on cognitive processing, its explanatory power could be reduced when cognitive processing is less involved in the decision-making process (Reed & Lloyd, 2018). Aggarwal and Law (2005) find that the strategies that people apply to process information depend on the perceived social distance between communicators. Individuals tend to process information more cognitively and at a lower level of abstraction when they perceive greater social distance from others.

5.2. Managerial implications

Our findings also offer several managerial implications that might help to promote the development of the sharing economy and collaborative consumption. First, a positive attitude toward collaborative consumption must be cultivated, and this can be achieved by emphasizing the cost savings brought about by collaborative consumption, introducing the concept of environmental protection, and promoting consumer awareness of social responsibility.

Second, social recognition and encouragement of collaborative consumption would ideally be increased. The development of the sharing economy has led to industrial reform, but it has also given rise to conflicts among various stakeholders, and hence, it could be urgent that the government actively guide and regulate the industry to promote social consensus for the

development of the sharing economy and collaborative consumption. This may help consumers to build the correct subjective norms for collaborative consumption. In China, local governments have introduced new policies on online car-hailing to regulate operations, and the governments have also attempted to manage the conflict of interest between online car hailing and traditional taxis.

Third, relevant guarantee systems, such as government supervision and social collaborative governance for collaborative consumption, may need to be built, as this will reduce consumers' risk perception and improve their perceived behavioral control. This will ensure that the platform functions on market principles with the help of a legal and regulatory framework. In this way, consumer rights and interests of idle resource users in collaborative consumption are protected. At present, some online car-hailing platforms have introduced measures, such as phone number protection, travel sharing, one-button alarm, etc. In the future, facial recognition technology may also be used to eliminate security risks. In addition to policy implementation, the government may also wish to accelerate urbanization (e.g., expanding commercial and residential areas) to promote the growth online car-hailing business (Sun & Elefteriadou, 2011).

Fourth, our findings reveal that close social distance positively influences collaborative consumption behavior. In collaborative consumption, in addition to the reputation mechanism and consumer credit, increasing similarity and familiarity between collaborative consumers is conducive for reducing social distance. Online car-hailing platforms may benefit from encouraging service providers to provide more personal information, and facilitating users to

collaborate with familiar or similar individuals. Platforms could also consider familiarity and similarity in their algorithms for supply and demand matching. Moreover, they could promote collaborative consumption in groups by encouraging more service users to become providers.

5.3. Limitations and future research

First, this research focuses on the car-hailing industry. In other areas of collaborative consumption, social distance may have different effects on the participants in collaborative consumption, and the effects may be sensitve to platform policies and consumer trust. Future research may investigate other industries to ascertain the generalizability of our findings.

Second, this study only uses a survey to test the hypothesized model. Future research could experimentally manipulate social distance to develop a causal model with high internal validity.

Finally, this paper mostly discusses online car-hailing intention and behavior from the perspective of consumer psychology. Additional environmental factors related to car-hailing behavior should be included in future research. For example, additional commercial/residential land uses, better public transport accessibility, and high-density bus stops in a city may actively promote online car-hailing behavior (Sun et al., 2018; Sun & Ding, 2019).

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Appendix A

1. Preparation of questions

Social distance as the degree of emotional intimacy and the relationship between individuals and others in society was explained to the questionnaire respondents through the use of diagrams. We a overlapping degrees of two circles to describe the social distance between individuals A and B. The relationship between the two is not intimate and the social distance is great if the two circles do not overlap, and vice versa if they do. We showed participants seven pictures of two circles with different degrees of overlap and asked them to rate intimacy (1–7). Meanwhile, to prevent them from comparing all the circle pictures and forming a strong one-to-one correspondence relationship, we divided the participants into two experimental groups with one group answering a sequential questionnaire and the other group answering a randomized order version of the questionnaire.

2. Participants

The participants in the focus group were selected through Questionnaire Star, an online questionnaire platform widely used in academic research. Participants were selected by categories of age, gender, income, and online car-hailing experience to ensure diversity.

3. Focus group procedure

A total of 24 participants were invited to join three 30-minute focus groups from September to October 2020. Of the 24 participants (13 male, 11 female) with a mean age of 32.1 years (SD ¼ 10.9), all have had more than three years of online car-hailing experience by then.

Upon arrival and before the discussion, a check-in procedure was followed and each participant was asked to 1) show their online car-hailing service app, 2) sign the informed consent form, and 3) complete a background survey by answering questions related to car-hailing service habits. The discussion in each focus group was audio-taped with the permission of the participants. By studying and comparing answers from each participant and between groups, it was concluded that a "saturation point" had been attained and no additional focus groups were needed.

Table 9. Focus group categories and questions

Q1 Opening question
Tell us something about yourself. Are you familiar with online car-hailing service? How long have you been using online car-hailing service? How often do you use online car-hailing service?
Q2 Introductory question
What comes to mind when you hear "interpersonal relationship intimacy?"
Q3 Transition question

Social distance is a concept used to describe the degree of emotional intimacy and the relationship between individuals and others in society. In people's daily lives, there are different degrees of intimacy between individuals and drivers when booking a taxi online. What do you think of your intimacy with online car-hailing drivers?

Q4 Key question

We use the overlapping degree of two circles to describe the social distance between individuals A and B. When the two do not overlap, it means that the relationship between the two is not intimate and the social distance is far; when there is more overlap, the relationship between the two is closer, as is the social distance. According to this rule, please give a score of 1 through 7 for the social distance expressed in the following seven pictures.

Q5 Final question

Today, we talked about the intimacy between drivers and users, and then discussed the intimacy scoring by looking at the correspondence between the degree of overlap between two circles. Would you like to add any comments?

4. Analysis of the results

4.1. Sequential questionnaire

Figure 1 through Figure 7 included 11 samples in total (two problematic samples were deleted), that is, from low intimacy (more social distance) to high intimacy (less social

distance). Note: SD 1 refers to the circle chart, which corresponds to the picture with intimacy score of 1, and so on.

Table 10. Data description

Items	**n**	**min**	**max**	**mean**	**std**
Q1.SD1	11	1	2	1.36	.505
Q2.SD2	11	2	3	2.36	.505
Q3.SD3	11	3	4	3.27	.467
Q4.SD4	11	4	5	4.45	.522
Q5.SD5	11	5	7	5.45	.688
Q6.SD6	11	5	7	6.09	.701
Q7.SD7	11	6	7	6.82	.405
Total	11				

4.2. Random order questionnaire

We randomly scrambled the order in which the pictures were presented. The measurement results are consistent with the graphical measurement (except for the result of intimacy 7, the others are for the most part larger).

Table 11 Data description

Items	n	min	max	mean	std
Q1.SD6	13	5	7	6.38	.650
Q2.SD3	13	2	4	3.23	.725
Q3.SD1	13	1	2	1.31	.480
Q4.SD5	13	4	6	5.15	.555

Q5.SD2	13	1	3	2.08	.641
Q6.SD7	13	6	7	6.92	.277
Q7.SD4	13	4	5	4.31	.480
Total	13				

4.3. Univariate

To verify that the difference in the mean value of each question is significant, we use SPSS21.0 for analysis (see Table 12). It is found that the p value of pairwise comparison of questions is less than 0.05. Therefore, the mean value of each question is significantly different.

Table 12. Results of univariate

(I) Group	(J) Group	(I-J)	S.E.	Sig.
1	2	−.88*	.160	.000
	3	−1.92*	.160	.000
	4	−3.04*	.160	.000
	5	−3.96*	.160	.000
	6	−4.92*	.160	.000
	7	−5.54*	.160	.000
2	1	.88*	.160	.000
	3	−1.04*	.160	.000
	4	−2.17*	.160	.000
	5	−3.08*	.160	.000
	6	−4.04*	.160	.000
	7	−4.67*	.160	.000
3	1	1.92*	.160	.000
	2	1.04*	.160	.000

	4	−1.13*	.160	.000
	5	−2.04*	.160	.000
	6	−3.00*	.160	.000
	7	−3.63*	.160	.000
	1	3.04*	.160	.000
	2	2.17*	.160	.000
	3	1.13*	.160	.000
4	5	−.92*	.160	.000
	6	−1.88*	.160	.000
	7	−2.50*	.160	.000
	1	3.96*	.160	.000
	2	3.08*	.160	.000
	3	2.04*	.160	.000
5	4	.92*	.160	.000
	6	−.96*	.160	.000
	7	−1.58*	.160	.000
	1	4.92*	.160	.000
	2	4.04*	.160	.000
	3	3.00*	.160	.000
6	4	1.88*	.160	.000
	5	.96*	.160	.000
	7	−.63*	.160	.000
	1	5.54*	.160	.000
	2	4.67*	.160	.000
7	3	3.63*	.160	.000
	4	2.50*	.160	.000
	5	1.58*	.160	.000

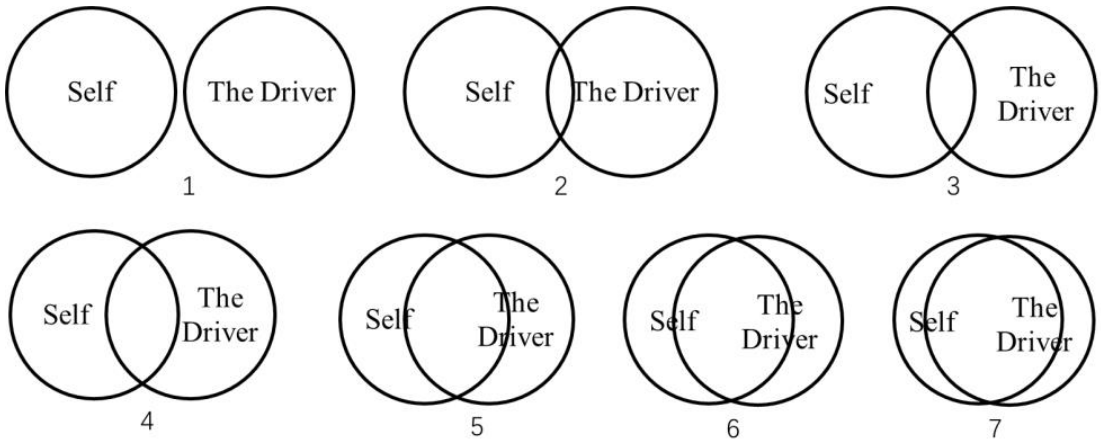
	6	.63*	.160	.000

Note：*p < 0.05

Appendix B

Regarding consumption as riding in a stranger's private car through online car-hailing, how much do you agree with the following statements (5 represents high approval, 1 represents disapproval)?

Items		**1**	**2**	**3**	**4**	**5**
A1.	I think the consumption is a good idea					
A2.	I think the consumption is favorable					
A3.	I think the consumption is a wise choice					
B1.	People around me think it is wise for me to consume like this					
B2.	People around me think it is helpful for me to consume like this					
B3.	People around me think it is worthwhile for me to consume like this					
C1.	This consumption is entirely within my control					
C2.	I have the knowledge and ability to complete the consumption activities					
C3.	I am able to consume like this					
D1.	I would like to recommend this way of consumption to others					
D2.	I am willing to consume again					
D3.	I am willing to provide some personal information to promote consumption					



Q5. Social distance is the degree to which an individual perceives a lack of intimacy with other individuals. According to the social distance between you and private car drivers on online car-hailing, what level of social distance do you feel? The greater the degree of overlap, the closer the social distance, and less overlap indicates greater social distance.

The social distance between me and the group of private car drivers of online car-hailing is_____.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Aron A, Aron E N, Tudor M, & al, e. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology, 60*(2), 241.

Belk, R. (2014). You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research, 67*(8), 1595-1600.

Benjaafar, S., Kong, G., Li, X., & Courcoubetis, C. (2019). Peer-to-peer product sharing: Implications for ownership, usage, and social welfare in the sharing economy. *Management Science, 65*(2), 477-493.

Benoit, S., Baker, T. L., Bolton, R. N., Gruber, T., & Kandampully, J. (2017). A triadic framework for collaborative consumption (CC): Motives, activities and resources & capabilities of actors. *Journal of Business Research, 79*, 219-227.

Bozman, R., & Rogers, L. (2016). Collaborative consumption business model under Internet thinking in the era of sharing economy. *Transportation and harbor navigation, 3*(05), 71.

Buckner, R. L., & Carroll, D. C. (2007). Self-projection and the brain. *Trends in Cognitive Sciences, 11*(2), 49-57.

Chandran, S., & Menon, G. (2004). When a day means more than a year: Effects of temporal framing on judgments

of health risk. *Journal of Consumer Research, 31*(2), 375-389.

Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of applied social psychology, 28*(15), 1429-1464.

Efthymiou, D., Antoniou, C., & Waddell, P. (2013). Factors affecting the adoption of vehicle sharing systems by young drivers. *Transport Policy, 29*, 64-73.

Etang, A., Fielding, D., & Knowles, S. (2011). Does trust extend beyond the village? Experimental trust and social distance in Cameroon. *Experimental Economics, 14*(1), 15-35.

Felson, M., & Spaeth, J. L. (1978). Community structure and collaborative consumption. *American Behavioral entist, 21*(4), 614-624.

Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: an integrated model. *MIS quarterly, 27*(1), 51-90.

George, J. F. (2004). The theory of planned behavior and Internet purchasing. *Internet Research, 14*(3), 198-212.

Gordon, M. (1998). A dictionary of sociology. *NY: Oxford*.

Han, S., Lerner, J. S., & Keltner, D. (2007). Feelings and consumer decision making: The appraisal-tendency framework. *Journal of consumer psychology, 17*(3), 158-168.

Jiang, B., & Tian, L. (2018). Collaborative consumption: Strategic and economic implications of product sharing. *Management Science, 64*(3), 1171-1188.

Kwon, S. (2020). Understanding user participation from the perspective of psychological ownership: The moderating role of social distance. *Computers in Human Behavior, 105*.

Li, Y., & Xia, J. (2009). The influence of social distance on voluntary cooperation: a literature review *World economic literature*(02), 89-98.

Liberman, N., & Trope, Y. (2014). Traversing psychological distance. *Trends in Cognitive Sciences, 18*(7), 364-369.

Liberman, N., Trope, Y., & Stephan, E. (2007). Psychological distance. *Social psychology: Handbook of basic principles, 2*, 353-383.

Lin, C. A., & Xu, X. (2017). Effectiveness of online consumer reviews The influence of valence, reviewer ethnicity, social distance and source trustworthiness. *Internet Research, 27*(2), 362-380.

Lindblom, A., Lindblom, T., & Wechtler, H. (2018). Collaborative consumption as C2C trading: Analyzing the effects of materialism and price consciousness. *Journal of Retailing and Consumer Services, 44*, 244-252.

Lu, D., Liu, Y., K.W.Lai, I., & Zeng, X. (2018). Collaborative consumption in the sharing economy: possession or use? . *Foreign economy and management, 40*(08), 125-140.

Mantovani, D., de Andrade, L. M., & Negrao, A. (2017). How motivations for CSR and consumer-brand social distance influence consumers to adopt pro-social behavior. *Journal of Retailing and Consumer Services, 36*, 156-163.

Martin, E., Shaheen, S. A., & Lidicker, J. (2010). Impact of Carsharing on Household Vehicle Holdings Results from North American Shared-Use Vehicle Survey. *Transportation Research Record*(2143), 150-158.

Mizerski, R. W., Golden, L. L., & Kernan, J. B. (1979). The attribution process in consumer decision making.

Journal of Consumer Research, 6(2), 123-140.

Park, R. E. (1924). The concept of social distance as applied to the study of racial attitudes and racial relations. *Journal of Applied Sociology, 8*(6), 339-344.

Paundra, J., Rook, L., van Dalen, J., & Ketter, W. (2017). Preferences for car sharing services: Effects of instrumental attributes and psychological ownership. *Journal of Environmental Psychology, 53*, 121-130.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods Instruments & Computers, 36*(4), 717-731.

Schor, J. B., & Fitzmaurice, C. J. (2015). 26. Collaborating and connecting: the emergence of the sharing economy. *Handbook of research on sustainable consumption, 410*.

Schreiner, N., Pick, D., & Kenning, P. (2018). To share or not to share? Explaining willingness to share in the context of social distance. *Journal of Consumer Behaviour, 17*(4), 366-378.

SIC. (2020). Report on the development of China's sharing economy, (www.sic.gov.cn/News/568/01548..htm)

Spreng, R. N., Mar, R. A., & Kim, A. S. N. (2009). The Common Neural Basis of Autobiographical Memory, Prospection, Navigation, Theory of Mind, and the Default Mode: A Quantitative Meta-analysis. *Journal of Cognitive Neuroscience, 21*(3), 489-510.

Sun, D., & Elefteriadou, L. (2011). Lane-changing behavior on urban streets: A focus group-based study. *Applied Ergonomics, 42*(5), 682-691.

Sun, D., & Ding, X. Q. (2019). Spatiotemporal evolution of ride sourcing markets under the new restriction policy: A case study in Shanghai. *Transportation Research Part A: Practice and Policy*, *130,* 227-239.

Sun, D., Zhang, K. S. & Shen, S. W. (2018). Analyzing spatiotemporal traffic line source emissions based on massive didi online car-hailing service data. *Transportation Research Part D: Transport and Environment, 62*, 699-714.

Tamir, D. I., & Mitchell, J. P. (2011). The Default Network Distinguishes Construals of Proximal versus Distal Events. *Journal of Cognitive Neuroscience, 23*(10), 2945-2955.

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information systems research, 6*(2), 144-176.

Tran, L., Cebrian, M., Krumme, C., & Pentland, A. (2011). Social Distance Drives the Convergence of Preferences in an Online Music Sharing Network. *Proceedings of the 2011 IEEE Third International Conference on Privacy, Security, Risk and Trust and IEEE Third International Conference on Social Computing (PASSAT/SocialCom 2011)*, 637-640.

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review, 117*(2), 440-463.

Wang, B. (2013). Collaborative Consumption: a comparative analysis between China and the united states. *Foreign Trade Econ.Pract*(01), 34-37.

Wang , H. L., & Chen, Z. (2017). Mechanism of influence of trust on car-hailing intention in sharing economy -- quantitative analysis based on case study. *Journal of Management Case Studies, 10*(6), 616-632.

Won, A. S., Shriram, K., & Tamir, D. I. (2018). Social Distance Increases Perceived Physical Distance. *Social Psychological and Personality Science, 9*(3), 372-380.

Wu, T., Shen, Q., Xu, M., Peng, T. D., & Ou, X. M. (2018). Development and application of an energy use and CO2 emissions reduction evaluation model for China's online car hailing services. *Energy, 154*, 298-307.

Yang, X. (2019). How perceived social distance and trust influence reciprocity expectations and eWOM sharing intention in social commerce. *Industrial Management & Data Systems, 119*(4), 867-880.

Yang, X., & Deng, Y. (2014). The influence of emotional attachment on consumer's participation in collaborative consumption -from the perspective of product disposal. *Consumer. Econ, 30*(05), 56-60.

Zhou, F., Chen, L., & Su, Q. (2019). Understanding the impact of social distance on users' broadcasting intention on live streaming platforms: A lens of the challenge-hindrance stress perspective. *Telematics and Informatics, 41*, 46-54.