

# Will Online Car-Hailing Affect Consumers' Decisions about Automobile Purchase?—An Empirical Study Based on Questionnaire Investigation

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## Abstract

The online car-hailing industry, which provides the right of use, has a certain impact on the traditional automobile market, but there is no unified theory on whether it has a positive impact or a negative impact. Based on 362 consumer questionnaire data, this study builds a structural equation model to discuss the driving factors of residents' choice of online car-hailing and whether the development of online car-hailing will have a certain substitution impact on the sales of private cars. From the perspective of consumers' purchase intention, the research results show that consumers' price consciousness, convenience consciousness, environmental protection consciousness and possession tendency will affect their choice of travel mode, and the use of online car-hailing is positively correlated with consumers' willingness to replace private car ownership with online car-hailing.

## Keywords

Online Car-Hailing, Willingness to Use, Ownership Substitution, Carpooling

## 1. Introduction

Travel demand is one of people's basic needs. With the continuous development of the global economy, people's demand for car purchase is also increasing. Private car travel has a very strong negative externality. While providing consumers with more convenient and high-quality travel, it also has a great impact on urban traffic congestion and environmental pollution. How to achieve the balance between traffic and environment, not only meet the travel needs of the public,

but also reduce the growth rate of cars, has become an important topic in the world.

In recent years, with the integration of mobile Internet information technology and business model innovation, there have been a lot of innovations in the field of travel, of which online car-hailing is a typical representative. Online car-hailing has changed the common regulatory dilemma in the taxi industry and supplemented the problem of insufficient supply of traditional public transport. Online car-hailing provides demand response service based on LBS, which greatly improves the convenience of taking a taxi and reduces the empty driving rate of vehicles. Compared with buying a car and spending high maintenance costs and fuel costs, the cost of online car-hailing is also lower. Especially in large cities, the existence of online car-hailing solves the problems of difficult parking, difficult charging and unfamiliar roads, especially reducing the safety risk of drivers with insufficient driving experience. Therefore, online car-hailing is welcomed by people.

From the existing research, many scholars have explained the problem of “sharing the right to use” in people’s use of online car-hailing, which also lays a good foundation for the research of this paper.

Bardhi and Eckhardt [1] put forward a new division of consumption decision-making according to whether consumers obtain the ownership of products. One is liquidity consumption, which refers to short-term dematerialized consumption based on use right; The other is physical consumption, which refers to the continuous and ownership based material consumption. With the improvement of consumers’ education and the development of Internet information technology, consumers pay more and more attention to the use right of goods. By obtaining the right to use products or services, consumers can access products they can’t afford or products they can’t own due to space and time constraints [2].

Studies have shown that consumers’ ultimate pursuit of some goods is no longer ownership, but are willing to pay the corresponding cost in order to obtain the product experience [3]. From the perspective of substitution, non ownership consumption may replace the acquisition and possession of goods to a certain extent [4]. Moeller and Wittkowski discussed the determinants of consumers’ preference for non ownership under the traditional rental scenario. Through empirical analysis, they concluded that consumers’ product possession tendency, experience orientation, price consciousness, convenience orientation, trend orientation and environmental protection consciousness are the main factors in their preference for rental rather than purchase [4]. Some scholars also pointed out that under the non ownership consumption mode, consumers do not have to bear all the risks and responsibilities of products [5]. Schaefer, Lawson and Kinney [6] further studied on this basis and divided the ownership risk into three dimensions, namely financial risk, performance risk and social risk. Consumers’ deeper perception of the above risk dimensions will increase

their choice of non ownership and reduce ownership acquisition. Based on the research of Moeller and Wittkowski [4], some scholars discussed selection difficulties, diversification pursuit and brand loyalty as the factors affecting consumers' choice of non ownership, and proved that these factors have a certain impact on non ownership consumption; At the same time, these scholars divided consumers into four categories, respectively labeled as "impetuous drifters", "high-quality guardians", "conscious materialists" and "change seekers". Through follow-up research, it was proved that the four groups were affected by different factors to different degrees [7].

The form of sharing economy is a consumption mode that does not transfer the ownership of products and only obtains the right to use products. In recent years, the rise and development of mobile Internet, big data, positioning technology and mobile payment have spawned a series of sharing platforms, one of which is the online car-hailing platform that only provides the right to use cars, and car purchase is an ownership consumption mode. According to the research of Lovelock and Gummesson [8], as the right to use goods receives more and more attention, the consumption mode for the purpose of obtaining the ownership of goods will be impacted to a certain extent. Therefore, the development of online car-hailing may affect car sales to a certain extent. However, some scholars pointed out that different from the traditional non ownership consumption mode (such as leasing), a key feature of the sharing platform is that both the demander and the supplier are durable goods consumers, which means that both sides may be actively changing their resource stock, and consumers may be willing to give up or postpone buying cars after using online car-hailing. However, due to the existence of supply side drivers, they need a car to access the platform and become a service provider. Therefore, whether the development of online car-hailing will affect car sales cannot be simply concluded.

Online car-hailing plays a good substitute role in many consumer travel scenarios. Which will have an impact on people's decision whether to buy a car. However, from the perspective of micro consumers, there is no final conclusion on the extent and scope of online car-hailing can replace online car-hailing. Moreover, there are still many scenes that cannot be replaced by online car-hailing. This requires us to understand the true wishes of travelers and quantitatively evaluate the impact of online car-hailing. This study will be based on this. This study helps to analyze the online car-hailing industry more accurately, and provides reference for online car-hailing management policy and traditional car substitution policy.

## **2. Basic Analysis and Hypothesis**

### **2.1. Evidence from Industry Performance**

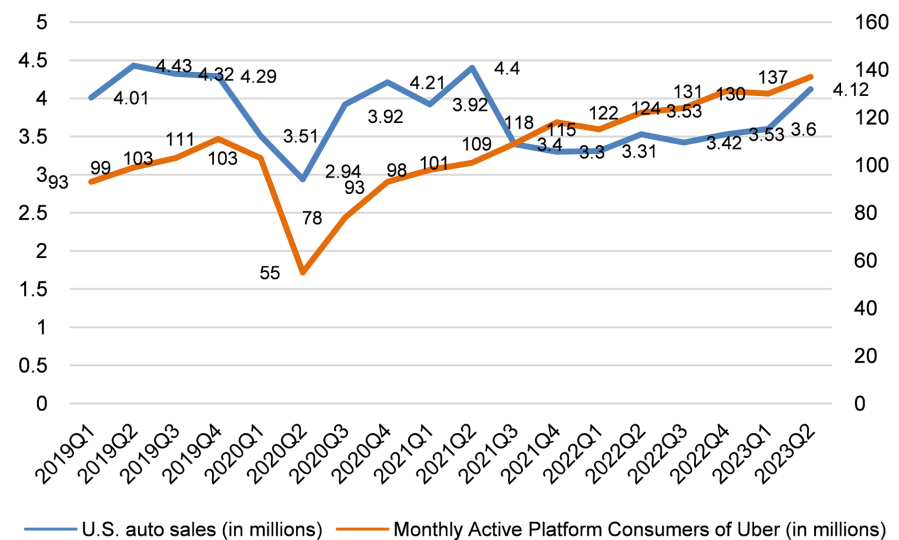
Online car-hailing provides consumers with more friendly, convenient and relatively low-cost travel services, and has become an indispensable way for people to travel. According to the latest research report released by strategy analytics car

connected travel (ACM) service, the number of active drivers in the global on-line car-hailing service will grow at a CAGR of 9.8% in the next 10 years.

The United States is the birthplace of online car-hailing and the second largest online car-hailing market in the world. By the end of 2019, Uber, the largest on-line car-hailing platform in the United States, had more than 100 million active users. We collected data on the number of active users and car sales of Uber platform from 2019 to 2023 (Figure 1). From Figure 1, the number of users of online car-hailing platform basically shows a straight-line increase. At the same time, the overall sales of passenger cars in the United States show a quarterly downward trend over time.

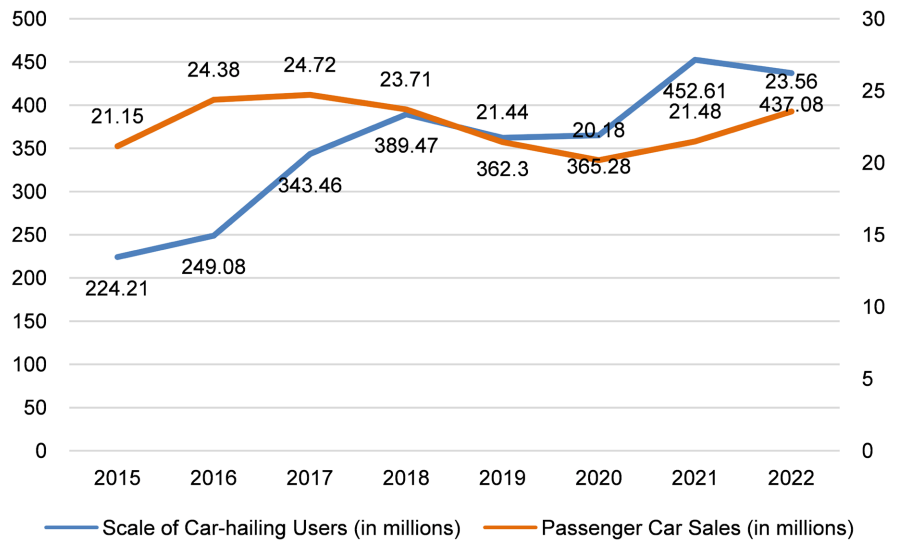
China also presents a situation similar to that of the United States. From 2015 to the end of 2022, the number of online car-hailing users increased very rapidly from 224.21 million to 437.08 million (Figure 2). According to the data released by China’s transportation department in March 2021, online car-hailing orders reached 760 million in March, with a daily order volume of about 24.52 million. At the same time, car sales show a completely different trend. Since 1990, China’s auto industry has maintained a long-term stable positive growth. Especially in the golden decade from 2001 to 2010, the annual growth rate of automobile sales basically remained above 20%. However, after 2010, the sales growth rate of China’s auto market began to slow down. By 2018, the automobile market will have negative growth for the first time, and continue to decline in 2019 and 2020.

From the relationship between the development of online car-hailing and car sales, we can clearly see that the two have a directional correlation. As the industrial development is affected by many uncertain factors, we can’t make an arbitrary conclusion. Therefore, this study continues to analyze travelers’ evaluation of online car-hailing and its impact on car purchase decision from the micro level.



Data source: Motor Intelligence, MarkLines; Uber official website.

Figure 1. Cross analysis of US auto sales and Uber quarterly activity.



Data source: China Internet Network Information Center and China Automotive Industry Association.

**Figure 2.** Cross analysis of Passenger car sales and Scale of car-hailing users in China.

## 2.2. Analysis from Consumer Behavior Perspective

This study attempts to explore the impact of the development of online car-hailing on automobile sales on the consumer side from a micro perspective, and explore the driving factors of consumers' use of online car-hailing. As a branch of sharing economy, online car-hailing is a new form of non ownership consumption. In order to explore whether the development of online car-hailing has an impact on automobile ownership consumption, combined with the research status of online car-hailing, this study mainly discusses the impact of consumers' price awareness, convenience awareness, environmental awareness and possession tendency on their willingness to use online car-hailing instead of private cars, that is, whether consumers prefer non ownership consumption in the context of online car-hailing. At the same time, existing studies have directly discussed that the driving factors will lead to consumers' preference for non ownership mode, did not consider whether these factors will directly affect consumers' attitude towards ownership, and did not prove the relationship between preference for non ownership and ownership substitution through empirical research. Therefore, this study takes the non ownership model, that is, the willingness to use online car-hailing, as the intermediary variable and the ownership substitution as the outcome variable to discuss the intermediary role of non ownership consumption.

Price awareness is the sensitivity of consumers to pay for goods or services [9]. Dolan and Simon pointed out that consumers' perception of commodity price is an important factor in determining their purchase [10]. In the mode of not obtaining ownership, the consumption price is determined by the time and frequency of consumers using the commodity, and it is difficult to estimate the cumulative cost. However, for durable goods with high prices, non ownership

consumption can prevent consumers from paying large sums of money at one time and free consumers from the expensive burden. This is also the main reason for the rapid development of sharing mode [11]. Some scholars point out that economic considerations, transaction costs and cost savings make consumers more willing to choose the form of sharing [12]. Residents' full use of this shared service will save a lot of costs such as maintenance, insurance and parking (sundarajan, 2013) [13].

Convenience awareness indicates that consumers tend to spend less time and energy in the consumption process [14]. In the non ownership consumption mode, consumers do not have to spend time and energy comparing goods, and can return the goods after using them, without bearing the burden of storage and retention. As a form of non ownership consumption, in addition to the above advantages, online car-hailing also provides users with on-demand travel service and freedom to use different models [15]. Lamberton and rose found that another reason for consumers to use sharing is its flexibility [16]. For example, consumers can flexibly switch with other modes of transportation; When traveling one way or attending occasions requiring drinking, compared with private cars, using online car-hailing can avoid looking for parking spaces and driving on behalf of others.

Environmental awareness means that consumer behavior will be affected by their judgment on whether the product is "environment-friendly" [17]. Sharing is essentially a mode of integrating excess resources and improving asset utilization. It is a sustainable consumption behavior [18], which has a natural attraction for users who pay attention to the ecological environment [11]. However, in the field of travel, at present, most of the online cars are fuel vehicles. Theoretically, under the same distance, the difference in exhaust emission between online cars and private cars should be very small, which has no significant effect on environmental protection; Moreover, public travel modes such as bus and subway have a more significant effect on environmental protection. Therefore, we believe that from the perspective of environmental protection, consumers will want to reduce the use of private cars, so they will increase their willingness to replace ownership, but they will also use less online car-hailing.

Possession tendency refers to consumers' possession and privatization of goods, which is an important feature of ownership consumption [19]. Non ownership consumption can obtain the right to use the product and retain the benefits arising from the use of the product. When consumers occupy the goods, in addition to the above rights, they also have the property right and disposal right of the goods [4]. As a consumption mode that does not involve ownership transfer, sharing economy is more friendly to consumers with lower awareness of commodity possession. They will avoid maintaining identity with shared products and do not expect to achieve self extension based on possession [20]. For consumers with a strong sense of commodity possession, especially for cars, which have a certain symbolic meaning of status, online car-hailing deprives

them of their right to own cars, and then loses a series of material and emotional satisfaction, so consumers are not willing to use online car-hailing.

Whether ownership consumption or non ownership consumption will be affected by consumer awareness. Consumers choose the mode that benefits them the most by comparing different consumption forms. Although some scholars have pointed out that ownership and non ownership consumption are not absolutely exclusive or alternative modes, consumers can own private cars and use online car-hailing in some special situations where cars are urgently needed [1]. However, for each consumption behavior, if consumers choose non ownership, they can no longer choose ownership. Armstrong and morwitz (2004) selected four durable goods as experimental objects, and the research proved that it is effective to predict consumers' future behavior with consumers' will. Therefore, the stronger consumers' willingness to use non ownership, the number and frequency of non ownership consumption will increase accordingly, and consumers' ownership purchase or use will decrease, that is, the substitution effect of non ownership on ownership will increase. In the context of online car-hailing, that is, the willingness to use online car-hailing will affect consumers' willingness to buy cars or replace private cars with online car-hailing. Because consumers' awareness will also affect their willingness to use online car-hailing, that is, the willingness to use online car-hailing constitutes an intermediary variable in the path of consumers' awareness affecting alternative willingness.

### 2.3. Analysis from Micro Perspective

Based on the literature review and theoretical analysis above, the model and assumptions have settled as follows (Figure 3):

H1: consumers' price awareness has a positive impact on ownership substitution. H2: consumers' convenience orientation has a positive impact on ownership substitution. H3: consumers' awareness of environmental protection has a positive impact on ownership substitution. H4: the possessive tendency of consumers has a negative impact on ownership substitution. H5: consumers' price awareness has a positive impact on online car-hailing intention. H6: consumers' convenience awareness has a positive impact on online car-hailing intention. H7: consumers' awareness of environmental protection has a negative impact on

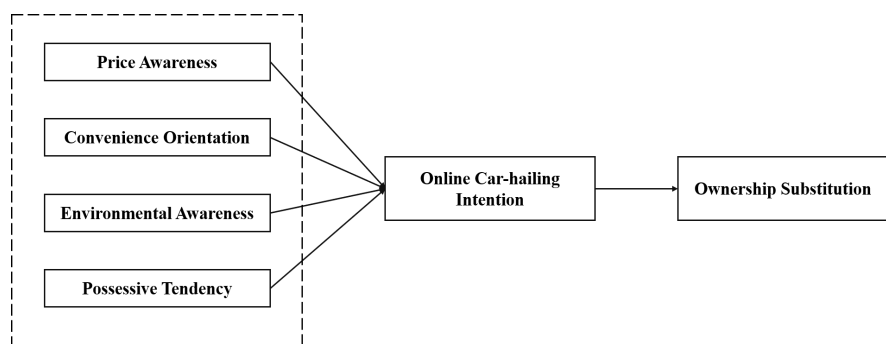


Figure 3. Consumer ownership consumption influencing factor model.

online car-hailing intention. H8: consumers' possession tendency has a negative impact on the willingness to use online car-hailing. H9: online car-hailing intention has a positive impact on ownership substitution. H10: online car-hailing intention has a mediating effect in the path of consumer awareness affecting ownership substitution, that is, consumer awareness (price awareness, convenience orientation, environmental awareness, possessive tendency) influences ownership substitution by influencing online car-hailing intention.

### 3. Empirical Research

#### 3.1. Data Collection and Descriptive Statistical Analysis

In the formal investigation stage, 390 questionnaires were collected through the questionnaire star. Excluding the questionnaires with low frequency of online car-hailing and less than 1 minute of response time, 362 valid questionnaires were retained, accounting for 92.82%. The basic information of the sample is shown in **Table 1**.

**Table 1.** Descriptive statistical analysis of samples.

Statistical variables		Quantity	Proportion (%)
Gender	Male	152	42.0
	Female	210	58.0
Age	19 - 25 years old	95	26.2
	26 - 30 years old	135	37.3
	31 - 40 years old	87	24.0
	41 - 50 years old	41	11.3
	Over 50	4	1.1
Education level	Junior high school and below	29	8.0
	High school	113	31.2
	Undergraduate/Junior College	192	53.0
	Master degree or above	28	7.7
Average monthly income/living expenses	Less than 5000	235	64.9
	5001 - 10,000	83	22.9
	10,001 - 20,000	33	9.1
	More than 20,000	11	3.0
Number of cars owned by households	0 vehicles	85	23.5
	1 vehicles	199	55.0
	2 vehicles	59	16.3
	3 and above	19	5.2



It can be seen from the above table that women account for 58.0% and men account for 42.0%; People aged 19 - 40 accounted for 87.5% of the total sample; The education level of the respondents is mostly high school or undergraduate/junior college, and the proportion of these two groups is 84.2%; In terms of income level, 64.9% of the respondents' monthly income is less than 5000, and 22.9% of the respondents' monthly income is between 5001 - 10,000; Most of the respondents' families have one or no car, and 21.5% have more than two cars.

### 3.2. Common Method Deviation Inspection

Common method deviation is a systematic error caused by the same data source or rater, the same measurement environment, project context and the characteristics of the project itself. This error may potentially mislead the conclusion. Therefore, in order to judge the influence degree of the sample affected by the deviation of the common method, Harman single factor test is used to conduct factor analysis without rotation for all items. The results show that the eigenvalues of six factors are greater than 1, the cumulative variation explained by the first factor is 30.176%, not more than 40%, and the cumulative load of six factors is 68.597%, more than 60%. Therefore, it shows that this study is not seriously affected by the deviation of the common method.

### 3.3. Reliability and Validity Test

Using Cronbach's  $\alpha$  Coefficient to test the reliability of sample data, If the coefficient is greater than 0.8, the reliability of the scale is good. **Table 2** shows Cronbach's of each variable, the index values are above 0.8, and the interval is 0.809 - 0.877, indicating that the reliability of the scale is good.

In the pre experiment stage, the content validity of the scale has been explained and will not be repeated here. For convergent validity and discriminant validity, Mplus software is used for confirmatory factor analysis to test whether the factor load of the item meets the requirements, and the fitting indexes of this research model are compared with the alternative five factor model, four factor model, three factor model and two factor model. It can be seen from **Table 3** that the factor load borne by the item of each variable is more than 0.6, which

**Table 2.** Reliability test of the scale.

Variable	Cronbach's $\alpha$ coefficient
Price consciousness	0.841
Convenience tendency	0.809
Environmental awareness	0.855
Possessive tendency	0.819
Willingness to use online car-hailing	0.836
Ownership substitution intention	0.877

meets the requirements of factor analysis, and the convergence validity of the scale passes the test.

**Table 4** shows the model index fitting with formal survey data. The  $\chi^2/df$  of the proposed six factor model is 1.471, the values of RMSEA and SRMR are 0.036 and 0.038 respectively, and the CFI and TLI are 0.969 and 0.964 respectively, which meet the requirements of relevant indicators. The indicators of the alternative five factor, four factor, three factor and two factor models are lower than the six factor model, Therefore, the six factor model is appropriate, and the six variables of the model have good discriminant validity.

**Table 3.** Load factor of the scale.

Variable	Item	Factor load	Variable	Item	Factor load
Price consciousness	PC1	0.652	Possessive tendency	PT1	0.798
	PC2	0.760		PT2	0.728
	PC3	0.713		PT3	0.744
	PC4	0.780		PT4	0.788
Convenience tendency	CT1	0.725	Willingness to use online car-hailing	W1	0.704
	CT2	0.680		W2	0.768
	CT3	0.724		W3	0.714
	CT4	0.684		W4	0.741
Environmental awareness	EA1	0.663	Ownership substitution intention	SI1	0.727
	EA2	0.768		SI2	0.829
	EA3	0.771		SI3	0.860
	EA4	0.808		SI4	0.712

**Table 4.** Fitting indexes of confirmatory factor analysis model.

Structural model	$\chi^2$	df	$\chi^2/df$	RMSEA	CFI	TLI	SRMR
Judgment index	-	-	<5	<0.08	>0.9	>0.9	<0.08
Six factor model (PC, CT, EA, PT, W, SI)	349.246	237	1.471	0.036	0.969	0.964	0.038
Five factor model (PC, CT, EA, PT, W + SI)	702.956	242	2.905	0.073	0.873	0.856	0.064
Four factor model (PC + CT, EA, PT, W + SI)	1017.400	246	4.136	0.093	0.788	0.762	0.081
Three factor model (PC + CT + EA + PT, W, SI)	1544.972	249	6.205	0.120	0.644	0.606	0.102
Two factor model (PC + CT + EA + PT, W + SI)	1898.600	251	7.564	0.135	0.548	0.502	0.114

### 3.4. Variable Correlation Test

The purpose of correlation analysis is to measure the correlation between the two variables. The larger the correlation coefficient, the smaller the p value, indicating that the correlation between the two variables is strong. Generally, the correlation coefficient between variables is less than 0.7, that is, the influence of collinearity between variables on the results is acceptable. This study uses SPSS for correlation test, mainly focusing on the Pearson coefficient and significance level between the two variables. As shown in **Table 5**, there is a significant positive correlation between consumers' price awareness and ownership substitution intention,  $r = 0.352$ ,  $P < 0.01$ ; There was also a significant positive correlation between consumers' convenience tendency and ownership substitution intention,  $r = 0.324$ ,  $P < 0.01$ ; There was a significant positive correlation between consumers' awareness of environmental protection and ownership substitution intention,  $r = 0.333$ ,  $P < 0.01$ ; There was a significant negative correlation between consumers' awareness of environmental protection and ownership substitution intention,  $r = -0.349$ ,  $P < 0.01$ ; There was a significant positive correlation between the willingness to use online car-hailing and consumers' willingness to replace private cars,  $r = 0.423$ ,  $P < 0.01$ . The results of correlation test show that the model is suitable for further structural equation analysis and hypothesis test.

### 3.5. Hypothesis Test

This study mainly tests the path in the model through Mplus software. Firstly, the main effect test is carried out to test whether the four consciousness of consumers have a significant impact on the willingness of online car-hailing to replace private cars. The bootstrap test results of 5000 times are shown in **Table 6**. Consumers' price awareness has a significant positive impact on ownership substitution intention,  $B = 0.145$ , 95% confidence interval [0.045, 0.240], excluding 0; The convenience tendency of consumers has a significant positive correlation with ownership substitution intention,  $B = 0.150$ , the 95% confidence interval is [0.043, 0.272], excluding 0; Consumers' environmental awareness has a significant positive impact on ownership substitution intention,  $B = 0.133$ , 95%

**Table 5.** Correlation coefficients of variables.

	PC	CT	EA	PT	W	SI
PC	1					
CT	0.292**	1				
EA	0.255**	0.233**	1			
PT	-0.311**	-0.230**	-0.376**	1		
W	0.389**	0.329**	0.348**	-0.396**	1	
SI	0.352**	0.324**	0.333**	-0.349**	0.423**	1

Note: \*\*indicates that the correlation is significant at the level of 0.01 (two tailed).

confidence interval is [0.023, 0.241], excluding 0; Consumer possession tendency has a significant negative correlation with ownership substitution intention,  $B = -0.141$ , 95% confidence interval  $[-0.246, -0.032]$ , excluding 0. At the same time, consumers' price awareness, convenience tendency, environmental awareness and possession tendency also have a significant impact on online car-hailing intention, and the confidence interval does not include 0. online car-hailing intention has a positive impact on ownership substitution, with a significance level of 0.000 and a confidence interval of [0.134, 0.376]. Therefore, it is assumed that  $H_1 - H_6$ ,  $H_8$  and  $H_9$  are verified and  $H_7$  is not verified.

Next, the intermediary effect is tested by bootstrap. The test results are shown in **Table 7**. Consumers' price awareness further affects their willingness to buy cars by affecting their willingness to use online car-hailing. The coefficient of the impact is 0.052, and the 95% confidence interval is [0.021, 0.101]; The coefficient that consumers' convenience consciousness affects ownership substitution intention through online car-hailing intention is 0.049, and the 95% confidence interval is [0.021, 0.095]; The intermediary effect of ownership substitution is 0.050, and the 95% confidence interval is [0.019, 0.096]; The mediating effect of possession consciousness on ownership substitution is  $-0.075$ , and the 95% confidence interval is  $[-0.130, -0.037]$ . Therefore, online car-hailing intention plays an intermediary role in consumer awareness and consumer substitution intention, and  $H_{10}$  can be verified.

**Table 6.** Main effect test results.

Path	Estimate	S.E.	P	95%LLCI	95%ULCI
PC to SI	0.145	0.060	0.015	0.045	0.240
CT to SI	0.150	0.063	0.017	0.043	0.272
EA to SI	0.133	0.066	0.045	0.023	0.241
PT to SI	-0.141	0.066	0.032	-0.246	-0.032
PC to W	0.199	0.072	0.006	0.082	0.318
CT to W	0.190	0.063	0.003	0.080	0.289
EA to W	0.192	0.065	0.003	0.085	0.296
PT to W	-0.290	0.067	0.000	-0.398	-0.181
W to SI	0.260	0.074	0.000	0.134	0.376

**Table 7.** Test results of mediating effect.

Path	Estimate	S.E.	P	95%LLCI	95%ULCI
PC to W to SI	0.052	0.023	0.028	0.021	0.101
CT to W to SI	0.049	0.022	0.024	0.021	0.095
EA to W to SI	0.050	0.023	0.028	0.019	0.096
PT to W to SI	-0.075	0.028	0.007	-0.130	-0.037

## 4. Conclusions and Discussion

### 4.1. Research Conclusions

From the perspective of micro data, this study discusses the impact of the emergence of online car-hailing sharing mode on the traditional form of ownership consumption from the perspective of substitution. The structural equation model verifies the hypothesis that h1 - h6, h8 - h10 and H7 environmental awareness has a negative impact on the use intention of online car-hailing, which has not passed the verification.

The results show that in the context of online car-hailing, consumers' purchase intention and online car-hailing behavior will be affected by subjective price consciousness, convenience tendency, environmental protection consciousness and possession consciousness; Consumers' willingness to use online car-hailing will have an impact on car purchase behavior. The stronger consumers' willingness to use online car-hailing, the stronger their willingness to replace private cars, postpone or give up buying private cars.

At the same time, we tested the mediating effect of online car-hailing intention, and found that consumers' subjective consciousness will affect their purchase intention of car ownership through online car-hailing intention. Consumers' willingness to buy cars will further affect their car purchase behavior, and then reduce car sales.

### 4.2. Discussion

Among them, we believe that online car-hailing is not prominent in terms of environmental protection. Consumers are mainly driven by price and convenience when considering online car-hailing, not environmental protection. Therefore, it is assumed that environmental awareness has a negative impact on online car-hailing intention, but the research results show that consumers' environmental awareness has a positive impact on online car-hailing intention. We have analyzed that although online car-hailing does not have environmental protection advantages over public transport, it has certain advantages over private cars. Prothero pointed out that online car-hailing can effectively improve the utilization efficiency of cars and reduce resource waste [21]; Shared travel also helps to reduce exhaust and noise pollution and improve urban congestion [22] [23]; King [24] studied the reduction of fuel consumption by online car-hailing and found that if one of every ten cars is shared by users, the annual fuel consumption can be reduced by 5.4%. online car-hailing also promotes the development of pure electric vehicles to a certain extent. Since 2018, some domestic cities such as Kunming, Zhengzhou, Dalian and Xiamen have successively formulated plans to require online car-hailing to use pure electric vehicles, which is not only of great significance to energy conservation and emission reduction, but also plays a certain role in cultivating the awareness of citizens concerned with environmental protection to use online cars [25].

This study points out that the impact of the development of online car-hailing

on the traditional ownership market can provide some references for the further development and transformation of automobile manufacturers. However, this study also has some defects, such as: the research objects are relatively concentrated, which can not reflect the purchase intention of all consumers; There may also be some deviation in car purchase behavior inferred from car purchase intention. Therefore, we will continue to explore and study in the future to make up for these defects.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- [1] Bardhi, F. and Eckhardt, G.M. (2017) Liquid Consumption. *Journal of Consumer Research*, **44**, 582-597. <https://doi.org/10.1093/jcr/ucx050>
- [2] Fleura, B. and Eckhardt, G. (2012) Access-Based Consumption: The Case of Car Sharing. *Journal of Consumer Research*, **39**, 881-898. <https://doi.org/10.1086/666376>
- [3] Chen, Y. (2009) Possession and Access: Consumer Desires and Value Perceptions Regarding Contemporary Art Collection and Exhibit Visits. *Journal of Consumer Research*, **35**, 925-940. <https://doi.org/10.1086/593699>
- [4] Moeller, S. and Wittkowski, K. (2010) The Burdens of Ownership: Reasons for Preferring Renting. *Journal of Service Theory & Practice*, **20**, 176-191. <https://doi.org/10.1108/09604521011027598>
- [5] Durgee, J.F. and O'Connor, G.C. (1995) An Exploration into Renting as Consumption Behavior. *Psychology & Marketing*, **12**, 89-104. <https://doi.org/10.1002/mar.4220120202>
- [6] Schaefer, T., Lawson, S.J. and Kukar-Kinney, M. (2016) How the Burdens of Ownership Promote Consumer Usage of Access-Based Services. *Marketing Letters*, **27**, 569-577. <https://doi.org/10.1007/s11002-015-9366-x>
- [7] Lawson, S.J., Gleim, M.R., Perren, R. and Hwang, J.Y. (2016) Freedom from Ownership: An Exploration of Access-Based Consumption. *Journal of Business Research*, **69**, 2615-2623. <https://doi.org/10.1016/j.jbusres.2016.04.021>
- [8] Lovelock, C. and Gummesson, E. (2004) Whither Services Marketing? *Journal of Service Research*, **7**, 20-41. <https://doi.org/10.1177/1094670504266131>
- [9] Lichtenstein, D.R., Bloch, P.H. and Black, W.C. (1988) Correlates of Price Acceptability. *Journal of Consumer Research*, **2**, 243-252. <https://doi.org/10.1086/209161>
- [10] Dolan, R.J. and Simon, H. (1996) Power Pricing: How Managing Price Transforms the Bottom Line. The Free Press, Hong Kong.
- [11] Hamari, J., Sjöklint, M. and Ukkonen, A. (2016) The Sharing Economy: Why People Participate in Collaborative Consumption. *Journal of the Association for Information Science and Technology*, **67**, 2047-2059. <https://doi.org/10.1002/asi.23552>
- [12] Barnes, S.J. and Mattsson, J. (2017) Understanding Collaborative Consumption: Test of a Theoretical Model. *Technological Forecasting and Social Change*, **118**, 281-292. <https://doi.org/10.1016/j.techfore.2017.02.029>
- [13] Sundararajan, A. (2013) From Zipcar to the Sharing Economy. *Harvard Business*

Review. <https://hbr.org/2013/01/from-zipcar-to-the-sharing-eco>

- [14] Seiders, K., Voss, G.B., Godfrey, A.L. and Grewal, D. (2007) SERVCON: Development and Validation of a Multidimensional Service Convenience Scale. *Journal of the Academy of Marketing Science*, **35**, 144-156. <https://doi.org/10.1007/s11747-006-0001-5>
- [15] Bardhi, F. and Eckhardt, G.M. (2012) Access-Based Consumption: The Case of Car Sharing. *Journal of Consumer Research*, **39**, 881-898. <https://doi.org/10.1086/666376>
- [16] Lambertson, C.P. and Rose, R.L. (2011) When Is Ours Better than Mine? A Framework for Understanding and Altering Participation in Commercial Sharing Systems. *Journal of Marketing*, **76**, 109-125. <https://doi.org/10.1509/jm.10.0368>
- [17] Abdul-Muhmin, A.G. (2010) Explaining Consumers' Willingness to Be Environmentally Friendly. *International Journal of Consumer Studies*, **31**, 237-247. <https://doi.org/10.1111/j.1470-6431.2006.00528.x>
- [18] Botsman, R. (2010) What's Mine Is Yours: The Rise of Collaborative Consumption. Harper Business, New York.
- [19] Miller, D. (1997) Material Culture and Mass Consumption. Wiley-Blackwell, Hoboken, 9, 256.
- [20] Weiss, L. and Johar, G.V. (2016) Products as Self-Evaluation Standards: When Owned and Unowned Products Have Opposite Effects on Self-Judgment. *Journal of Consumer Research*, **42**, 915-930. <https://doi.org/10.1093/jcr/ucv097>
- [21] Prothero, A., Dobscha, S., Freund, J., Kilbourne, W.E., Luchs, M.G., Ozanne, L.K. and Thøgersen, J. (2011) Sustainable Consumption: Opportunities for Consumer Research and Public Policy. *Journal of Public Policy & Marketing*, **30**, 31-38. <https://doi.org/10.1509/jppm.30.1.31>
- [22] Cervero, R., Golub, A. and Nee, B. (2007) City Car Share: Longer-Term Travel Demand and Car Ownership Impacts. *Transportation Research Record*, **1992**, 70-80. <https://doi.org/10.3141/1992-09>
- [23] Martin, E., Shaheen, S. and Lidicker, J. (2010) Impact of Carsharing on Household Vehicle Holdings: Results from North American Shared-Use Vehicle Survey. *Transportation Research Record: Journal of the Transportation Research Board*, **2143**, 150-158. <https://doi.org/10.3141/2143-19>
- [24] Jacobson, S.H. and King, D.M. (2009) Fuel Saving and Ridesharing in the U.S.: Motivations, Limitations, and Opportunities. *Transportation Research Part D*, **14**, 14-21. <https://doi.org/10.1016/j.trd.2008.10.001>
- [25] Schor, J.B. (2017) Does the Sharing Economy Increase Inequality within the Eighty Percent? Findings from a Qualitative Study of Platform Providers. *Cambridge Journal of Regions Economy & Society*, **10**, 263-279. <https://doi.org/10.1093/cjres/rsw047>