DOES SUBSIDY WORK? AN INVESTIGATION OF POST-ADOPTION SWITCHING ON CAR-HAILING APPS

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ABSTRACT

Subsidy has been consistently considered as an efficient way to attract consumers with low price, and can be measured through users' price tolerance. By focusing on car-hailing apps, this study investigates users' switching intention and continuous usage based on value-intention framework and Limayem's intention-habit-usage model under the context of lower subsidy. Price tolerance, as a perceived cost, was proved to have an effect on perceived value. From value perspective, utilitarian value, hedonic value and social value are conjointly hypothesized to affect users switch intention, while the switch intention is influenced by habit and alternative attractiveness. The relationships between switch intention and continuous usage are also investigated. Questionnaire data collected from 295 valid car-hailing apps users provide support for hypothesis validation of the research model. Discussions and implications of this study are provided.

Keywords: Switching intention; Car-hailing apps; Value; Price tolerance; Habit

1. Introduction

The ride hailing industry was fundamentally changed by the wide spread of mobile information technology and the proliferation of sharing economy, since the popularity of car-hailing apps has grown exponentially [Hamari et al. 2015]. In addition to the form of mobile electronic commerce, one interesting issue of the mobile taxi apps is the car sharing behavior enabled by the platform. Compared with old-style ride hailing, car-hailing apps provides unique car taking experiences (i.e., online-to-offline payments, convenient and comfortable service, social interactions), and have attracted a large number of registered users.

Especially in 2015, two giants (Didi and Uber) in Chinese mobile ride hailing industry proposed several ways to attract users, of which subsidy serves as one of the most efficient method. The two companies have spent billions in their battle for market share, which certainly have proved a boon to Chinese consumers. Generous subsidies, sometimes amounting to several times the price of the fare, meant that car hailing services were cheaper than an old-style taxi. However, recently in this year, the subsidy for the two giants keeps decreasing, which result from the government regulations and the companies' operation strategies. The two giants in China merged together in August, 2016 [Kalanick 2016]. Whether the Chinese consumers are willing to continuously use the car-hailing apps with lower subsidy have become an interesting issue to investigate. In other word, this paper set out to investigate

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users' switching intention (switching to old-style ride hailing) and actual behavior in the context of lower subsidy for Chinese car-hailing apps.

Despite the importance of understanding post adoption user intention in the information system (IS) discipline [Limayem et al. 2007; Ko 2013; Zhou 2013], very little is known about the effect of price perception on the users' post-adoption intention, especially in the context of sharing economy enabled car-hailing platforms. Some studies, however, indicated the role of price perception on post-purchase evaluation, but do not provide a theoretical justification for the cognitive process of perceived price on continuous usage intention [Voss et al. 1998; Liao & Cheung 2001]. Furthermore, some studies incorporate price and value into their research model from the value perspective [Kim et al. 2007], but the relationships between intention and actual behavior is still lack of research. There are gaps in our understanding of the behavioral mechanisms underlying continuous intention and behaviors to the mobile platforms.

Therefore, in our study, we proposed and empirically analyzed a conceptual framework that considered price tolerance from value perspective in the sharing economy enabled car-hailing environment. Since our study is based on the context of sharing economy, we specifically identified three types of value that might mediate the influence of price tolerance on switch intention. Moreover, we drew on post adoption literatures to posit the mechanisms from switch intention to behavior. Knowledge of the relationships will provide more practical clues for operators and managers to improve their business strategies.

2. Literature Review
2.1. Understanding User Switching

Generally, users' post-adoption intention in IS research has been conceptualized into three aspects, the continuous usage intention, the discontinuous intention and the switching intention, corresponding to users' loyalty, complaint and switch respectively. As the most frequently investigated construct, users' continuous intention refers to subjective probability that the users will continue to use or purchase the same product [Zhou 2013; Chiu et al. 2014]. As the reverse action, user resistance in IS post-adoption research normally associate with cost and benefits that constitute users' cognitive perception on whether to discontinuous use [Zhang et al. 2016]. However, much of the available literature on discontinuous intention deals with the question of abandon using. The issue of switching intention is deeper and more comprehensive. Thus, we focused on user post-adoption switching in this study.

A great deal of previous research into user switching has focused on the technology acceptance phrase [Ranganathan et al. 2006; Kim & Kankanhalli 2009], status quo bias theory was frequently used to illustrate users' resistance to information systems and the preference to maintain current situations [Hu et al. 2011; Kim & Kankanhalli 2009; Polites & Kankanhalli 2012]. In other word, many studies focused on the switch intention from traditional old-styled ways to the use of technology supported information systems. Of which, switching barriers was the most frequently mentioned construct to measure users' switching intention [Vázquez‑Casielles et al. 2009; Ghazali et al. 2016; Wu et al. 2014]. Switching cost and alternative of attractiveness are the two general aspects of switching barrier. Procedural switching cost, economic switching cost and relationship-based switching cost were proposed to be three sources that lead to user switching intention [Jones et al. 2002]. Since we focused on users' post adoption intention in this study, the constructs originated from technology acceptance switching barriers are not that suitable for the research context.

User switching in post adoption phrase was defined as the intention of users to discontinuous the uses of a specific product and switch to the substitutes [Zhang et al. 2009]. Push–pull mooring (PPM) framework is one of the leading models to understand users' multichannel switching intention [Chou et al. 2016; Zhang et al. 2012]. User switching intentions does not necessarily imply that the users abandon the accepted services, but to switch to the available alternatives [Ye & Potter 2011]. Most existing literatures into post adoption user switching have focused on the switching intention among digital services in parallel [Burnham et al. 2003; Woisetschläger et al. 2011]. Collectively, these studies outline a critical framework for understanding users' switching into peer electronic services [Li & Cheng 2014]. Firstly, the effect of price tolerance was seldom investigated. Secondly, user switching intention from electronic platforms into traditional old-style remains unclear.

2.2. Overview of Existing Models

Over the past decade, most research in users' post adoption has emphasized the investigation of usage intention. A thorough review of the literatures on usage intention reveals several research perspectives. Among the exiting studies, a majority concerns with the value-intention framework [Dodds & Monroe 1985], which assumes that perceived value of behavior consequences directly influenced ones' willingness to perform certain intentions. By drawing on the concept of perceived value, the value based decision model was performed to predict users' intention; perceived cost and benefit were considered as the antecedents of value [Kim et al. 2007; Hsu 2014]. Repeat purchase intention and adoption intention was widely investigated through value-intention framework [Lin et

al. 2012; Choi et al. 2004]. In a follow-up study, Shukla & Babin [2013] found that perceived value is also correlated with switching intention, however, the research context is based on offline channels. Although there are some studies that focused on online channels, their research mostly relates to users' switching from one online channels to another digital platform [Li & Cheng 2014], from old-style offline channels to the switching of online platforms [Polites & Kankanhalli 2012; Hsu, et al., 2014]. The current study requires refining to investigate the switching intention from online channel to offline channel from value-intention perspective. Thus, the value-intention framework serves as our theoretical basis to investigate user switching intention on car-hailing apps.

Since intention and IS behavioral usage are two distinct constructs, whether certain intention is positively correlated with user behavior is a practical question to investigate. Expectation-confirmation theory was frequently used to link performance and expectation together, and to predict users' continuous decision [Lee & Kwon 2011; Bhattacherjee 2011]. Based on the Bhattacherjee's [2001] model that explains IS users' continuous intention, Limayem's model highlighted the relationships between intention and actual usage behavior, IS habit was validated to exert a moderation effect [Limayem et al. 2007; Chiu et al. 2012; Agag & El-Masry 2016]. Especially in the context of user switching studies, the ability of a model to predict users' switching behavior is limited, although the great potential of habit to illustrate IS-related behaviors. Therefore, Limayem's model regarding to habit, intention and behavior serve as another theoretical basis for our present study [Limayem et al. 2007].

3. Research Model and Hypothesis

The conceptual framework utilized perceived value (social value, utilitarian value and hedonic value), price tolerance, switching intention, habit, switching behavior, alternative attractiveness together. The value-intention perspectives and Limayem's habit model are adopted to serve as our theoretical basis. Accordingly, this study holds that users implicitly evaluate perceived values to form switching intention. Price tolerance, as a cognitive cost, was regarded as the antecedent of perceived values that eventually impact switching intention. Figure 1 provides an overview of the conceptual model, the proposed relationships are explained below.
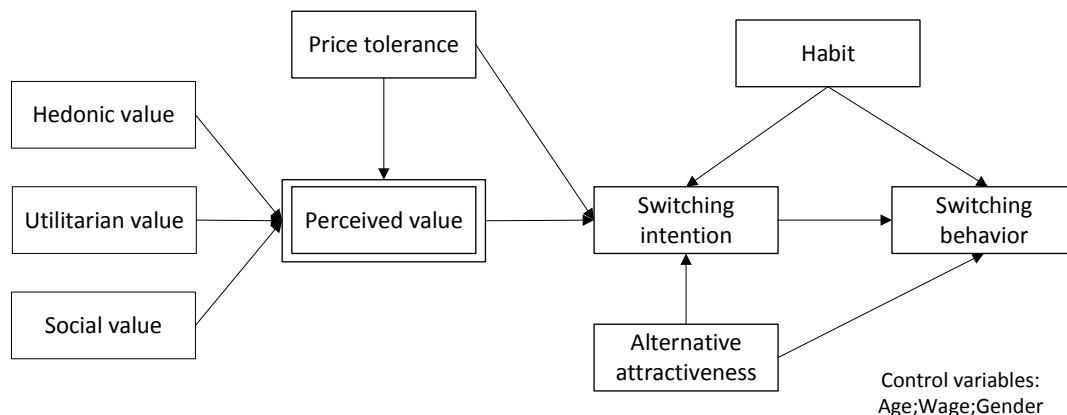

Figure 1: Research Model

3.1. Perceived Value

Perceived value refers to the overall assessment of benefits and sacrifices that obtained from user's consumption experiences [Chiu et al. 2014]. Originally, value is conceived as an uni-dimensional construct that reveals one's behavioral expectation and calculative surplus from the perspective of social psychology and economics [Kuo et al. 2009]. Later on, the classification of perceived value varies into multi-dimensions. The most widely accepted is the utilitarian value that explains functional benefits and costs and the hedonic value that is assessed by experiential benefits and sacrifices [Wu & Lu 2013]. However, the system of classification is in need of revision, since social value provides a more comprehensive view from symbolic interactionism perspective [Rintamäki et al. 2006]. In light of social value, the social role is highlighted through using the IS related tools. Especially in the context of sharing economy enabled car-hailing apps, social interaction is also deemed as an essential part. The nature of sharing economy enables interactions among drivers and clients, while the old-style ride hailing is just a transactional based relationships among drivers and clients. Thus, in this research, we adopt three-dimensions to exhibit perceived value.

In the research of relationships between perceived value and post-adoption intention, most existing empirical studies have pointed out the positive influence of perceived value on repeat purchase intention [Kuo et al. 2009; Kim et al. 2013; Ponte et al. 2015; Chiu et al. 2014]. The feedback loops of the perceived value will provide support for consumers' cognitive decision process. Accordingly, in the context of post-adoption switching research, users' switching intention is also affected by the perceived values. In this research, we focus on the switching from electronic channel to the traditional offline channels, hence, users should have a lower switching intention when they perceive higher values from the current digital platforms. Consequently, we propose the following hypotheses:

H1: Perceived value will negatively influence users' switching intention.

3.2.   Price Tolerance

Price is increasingly a vital topic in the context of electronic transactions. Liao & Cheung [2011] acknowledged that price as one of the most important measures for the cognitive assessment. In addition, some studies demonstrate the role of price tolerance on the perception of value [Vázquez- Casielles et al. 2009; Kim et al. 2007; Hsu et al. 2015], transaction utility theory was once adopted to illustrate the relationships between price and value perception [Alford & Biswas 2002]. Moreover, price reasonableness has become an indicator of the product quality that influences the perceived value [Han & Hyun 2015]. Reasonable pricing mechanism provides consumers a better perception of service evaluation, and thus facilitates value perception [Ryu & Han 2010]. This is evident in the case of marketing, if the price is higher than anticipated, consumers' satisfaction will be influenced, and also the value perception [Jiang & Rosenbloom 2005].

Moreover, the judgement of price often results in users' decision making. Current literature on price perception pays particular attention to the explanation of consumer behavior [Varki and Colgate 2001; Sweeney and Soutar 2001; Han & Hyun 2015]. Low price-conscious resulting from discount and subsidy was proved to have an influence on purchase intention [Alford & Biswas 2002]. From the perspective of Chinese car-hailing apps users, if their perception of price is high without subsidies, they will be more easily to switch to the old-style of car taking services. Thus, we propose that:

H2: Price tolerance is negatively related to perceived value.

H3: Price tolerance will positively influence users' switching intention.

3.3.   Switching Intention

Switching intention, as it explained in the previous section, has long been considered as the antecedent of IS behavior [Chen et al. 2012; Wu & Du 2012; Limayem et al. 2007]. The intention-behavior relationships may be challenged by the type of behavior, the time gap and the individual heterogeneity [Wu & Du 2012], but IS intention still serve as surrogate for usage. In the context of user switching, high level of switching intention dynamically leads to corresponding low level of continuous usage. Thus,

H4: Users' switching intention will negatively influence continuous usage behavior.

In light of exiting studies focused on the direct effect of habit on IS behavior [Ye & Potter 2011; Anshari et al. 2016; Cheng et al. 2016], indirect relationships among habit and IS behavior that IS intentions serve as the mediation variable [Orbell et al. 2001], past literatures have also found that habit will moderate the influence of IS intention on IS behavior, and limit the predictive power of intention [Limayem et al. 2007; Yin & Zhu 2014]. Habit, was defined as "learned sequences of acts that become automatic responses to specific situations, which may be functional in obtaining certain goals or end states" [Verplanken et al. 1997]. Accordingly, habit is an unconsciously formed construct and is in automatic nature [Woisetschläger et al. 2011]. Habit can influence the explanation power of intention to behavior, since reason based intention and habit are two seldom overlapped constructs that have an impact on IS behavior [Hsu et al. 2015]. Thus,

H5a: Habit will negatively influence users' switch intention.

H5b: Habit will positively influence users' continuous usage behavior.

The existence of comparable alternative provides users an additional choice for the current systems, the attractiveness of alternatives have become a barrier to repeat purchase [Ghazali et al. 2016; Bhattacherjee & Park 2014]. Even if users have obtained a high degree of continuous intention from value perception, the alternative attractiveness also influences users' ultimate decision [Zhang et al. 2009; Hsieh et al. 2012]. In other word, users perceive service quality and product quality based on value-intention framework, while the attractiveness of alternativeness provides other choices for users to adopt. Consequently, we propose the following hypotheses:

H6a: Alternative attractiveness will positively influence switch intention.

H6b: Alternative attractiveness will negatively influence continuous usage.

4.   Method

A survey was designed to test the proposed hypothesis. The survey measurements were constructed to evaluate the participants' perceived value, habit, alternative attractiveness, and switch intention about the sharing economy

based taxi apps. The questionnaire was developed through four stages, including the thorough literature review, user interview, pilot study and the formal test. Firstly, constructs related the users' intentions were identified, including the antecedents, consequences and the moderating variables. Secondly, we interviewed 5 experts about their perceived attitude toward switching intention. Specially, we asked the informants about their perceptions of the changes on subsidy. Their comments provided us some practical references for the modification of the investigated constructs. Then, the pre-test and pilot tests were conducted to evaluate the quality of the questionnaires. In total 30 students filled the questionnaire. Data pertaining to reliability analysis and factors were tested. Weakness in wording and formulation were detected and edited. After the first three steps, we began the official data collection process.

4.1.   Data Collection

The official data were mainly collected from online forums and social networks. A brief introduction about our research context was given before distributing the questionnaires. Only the ones who have once used taxi apps were invited into our survey. In order to facilitate satisfactory response rate, electrical return envelopes were provided randomly. The whole data collection process lasted four-day obtained 310 surveys from a variety of participants. Compared with early and late responses (i.e., those replied during the first two days and the last two days), as it suggested by Armstrong and Overton [1977], no significant differences exit based on the sample attributes (age, wages and gender).Therefore, non-response bias is not a problem in this research.

We carefully checked every piece of survey, invalid and incomplete ones were removed. There are three principles that we followed to filter the questionnaires. Firstly, the participants seldom had the experience of using taxi apps. Secondly, the same answers to all the questions. Thirdly, too many missing items that influence the data analysis, we removed the ones with over 20% missing items. Then, the final valid number for the questionnaire is 295. A brief demographic profile was provided in table 1 below.

Table 1: Demographic Information

Items	Category	Frequency	Ratio	Items	Category	Frequency	Ratio
Gender	Female	165	55.9%	Most frequently used car-hailing apps	Didi	183	62%
	Male	130	44.1%		Uber	81	27.5%
Age	Below 20	16	5.4%		Shenzhou	16	5.5%
	20-25	179	60.7%		Yidao	7	2.5%
	25-30	57	19.4%		Shouqi	3	1%
	30-35	14	4.7%		Others	7	2.5%
	Above 35	29	9.8%	Wage	Below 2000	105	35.6%
Types of car sharing	Tailored taxi service	60	20.3%		2000-5000	64	21.7%
	Fast ride	172	58.3%		5000-10000	69	23.4%
	Ride sharing	63	21.4%		10000-20000	41	13.9%
					Above 20000	16	5.4%

4.2.   Construct and Measurement

The survey measures for this study were mainly adopted from previous studies. Eight constructs were measured in this study: price tolerance, social value, utilitarian value, hedonic value, habit, alternative attractiveness, switching intention and switching behavior. All constructs were measured using multiple items. All items were adapted for the context of sharing economy based taxi apps. For each item, a five-point Likert scale was used with anchors from "1=strongly disagree" to "5=strongly agree". Apart from switching behavior (serve as the formative constructs), all indicators were modeled as being reflective of their respective constructs.

Kim et al. [2005] proposed two indicators to measure continuous usage behavior, which respectively are the frequency and the duration. For the mobile electronic commerce tools, especially the ride-hailing platforms, transactions happen online, but the offline service also matters. Therefore, IT duration is not suitable in our case to measure continuous usage. So, we only asked the frequency of the participants on using car-hailing apps from the perspective of subject view of perception and the objective view of frequency.

The items used to measure price tolerance were adapted from Vázquez‐Casielles et al. [2009]. In order to best fit the research context of subsidies for the car-hailing apps, we conducted corresponding modification. We aim to measure user's perception of price in the context of lower subsidy. Other studies concerning on price tolerance and price perception also give us references to refine the measurements [Sweeney and Soutar 2001; Han & Hyun 2015].

The items for measuring switch intention were adapted from Park & Ryoo [2013], while the items to measure alternative attractiveness were adapted from Bhattacherjee & Park [2014]. Habit was measured based on Limayem et al [2007], and those for measuring hedonic value, utilitarian value was adapted from Overby & Lee [2006], Chiu

et al [2014]. For the measurement of social value, we reviewed the study of Sweeney & Soutar [2001], and modified the items for the suitability of this research. Please see table 2 below for the detailed measurements.

Table 2: Constructs and Measurements

Constructs	Measurements	Items
Price tolerance [Adapted from Sweeney and Soutar 2001; Vázquez‐Casielles et al., 2009; Han & Hyun, 2015]	Without subsidy, I think the price for mobile taxi services is unacceptable.	PP1
	Without subsidy, the prices of mobile taxi apps are too high given their benefits.	PP2
	Without subsidy, the mobile taxi apps don't have a good economical value.	PP3
Habit [Adapted from Limayem et al. 2007]	Choosing mobile taxi apps to take a car has become automatic to me.	HB1
	Using mobile taxi apps to take a car is natural to me.	HB2
	When I need to take a car, using mobile taxi apps is an obvious choice for me.	HB3
	When I need to take a car, mobile taxi apps come to my mind.	HB4
Switch intention [Adapted from Park & Ryoo 2013]	I am considering switch to traditional taxi services.	SI1
	The likelihood of me switching to traditional taxi is high.	SI2
	I am determined to switch to traditional taxi.	SI3
Continuous usage [Adapted from Kim et al. 2005]	Every month in average, how many times did you call a car in the online car sharing platform?	SB1
	How do you consider the extent of your current car-hailing app use?	SB2
Alternative attractiveness [Adapted from Bhattacherjee & Park 2014]	Compared with mobile apps, traditional taxi is more attractive when I need to take a car.	AA1
	Compared with mobile apps, traditional taxi meet my needs better.	AA2
	Traditional taxi is convenient to me that I can switch to.	AA3
Hedonic value [Adapted from Overby & Lee 2006; Chiu et al. 2014]	The car taking experience is always a joy through mobile apps reserving a car.	HV1
	I feel good when I use mobile taxi services.	HV2
	Using mobile taxi services to take a car gives me pleasure.	HV3
Utilitarian value [Adapted from Overby & Lee, 2006; Chiu et al., 2014]	Mobile taxi services are very useful.	UV1
	I couldn't find a taxi what I really needed through the app.(reverse)	UV2
	While in need of a car, I found a car available nearby through the app.	UV3
Social value [Adapted from Sweeney & Soutar 2001]	The use of mobile taxi apps gives me social approval.	SV1
	The use of mobile taxi apps helps me feel acceptable by peers.	SV2
	The use of mobile taxi apps strength my social relationships.	SV3

5. Data Analysis

Partial least square (PLS) was used to test the proposed hypothesis. Firstly, as a component-based PLS regression technique, it supports models with no distribution assumptions and less minimal demand of sample size [Chin, 2003]. Secondly, compared with multiple regression that typically biased by measurement error, PLS enables multiple measures for each construct. Due to the accuracy and predictive power of PLS, and the exploratory nature of the present study, partial least square estimation was widely accepted to test our research model. In this study, SmartPLS 3.0 was chosen. We first assessed the measurement model to ensure reliability and validity, then the structural model was tested among the latent constructs to verify the research hypothesis.

5.1. Assessment of construct measurements

Assessments of measurement models include item reliability, internal consistency and discriminant validity. Correspondingly, item loadings, composite reliability (CR), Cronbach's alpha and correlation coefficients were tested. The results in table 3 of exploratory factor analysis (EFA) in the left and confirmatory factor analysis (CFA) in the right show good measurement properties. From the table 3, we can easily see that the loading as well as the Cronbach's α are all above 0.7, the AVE values are above 0.5, and all meet the recommended thresholds. Moreover, in order to sufficiently support the inconsistency test of the measurement model, we also conducted further analysis on test-retest measures, split-half coefficients and omega coefficients to validate the reliability of the model [Trizano-Hermosilla & Alvarado 2016; Churchill 1979; Brown et al. 2004]. Results show that all these measures meet the requirements of measurement model consistency.

Perceived value is measured by three first order constructs (hedonic value, utilitarian value and social value) that are not highly correlated and distinguishable. Repeated indicator approach was adopted to estimate higher order constructs with PLS [Ringle et al., 2012]. Perceived value, as a second-order construct, was directly measured by observed variables for all of the three first-order constructs.

Table 3: Results of EFA and CFA

Constructs	Items	EFA		CFA	
		Factor loadings	Cronbach's α	CR	AVE
Price tolerance	PP1	0.924	α= 0.846	0.851	0.657
	PP2	0.926			
	PP3	0.789			
Social value	SV1	0.819	α =0.801	0.875	0.712
	SV2	0.863			
	SV3	0.894			
Habit	HB1	0.821	α =0.845	0.864	0.681
	HB2	0.797			
	HB3	0.821			
	HB4	0.867			
Alternative attractiveness	AA1	0.856	α =0.809	0.810	0.898
	AA2	0.861			
	AA3	0.837			
Switch intention	SI1	0.855	α =0.835	0.838	0.633
	SI2	0.891			
	SI3	0.859			
Hedonic value	HV1	0.794	α =0.807	0.886	0.721
	HV2	0.864			
	HV3	0.886			
Utilitarian value	UV1	0.816	α =0.801	0.869	0.691
	UV2	0.867			
	UV3	0.815			

For the discriminant validity test, we compared the square root of AVE for each construct and the correlations between this construct and other constructs. If the value of the square root of AVE exceeds the later ones, we can see that the discriminant validity is validated. In other word, the given construct proved to be different from others. Firstly, we checked the convergent and discriminant validity of the second-order construct on perceived value. The results indicated the acceptable fit for the higher-order measurement model ($\chi2$= 38 (df = 15, p < .001), RMSEA= 0.072, CFI = 0.976, NFI = 0.961). The loadings of (ranging from to 0.73 to 0.91) on each dimension on perceived value were positive and significant (p<0.001).

Then, we conducted the confirmatory factor analysis on all other factors to make sure that each construct is independent from each other (table 4).

Table 4: Correlation Matrix of the Constructs

Items	1	2	3	4	5	6	7
1. Price tolerance	**0.866**						
2. Social value	-0.181	**0.844**					
3. Habit	-0.191	-0.434	**0.825**				
4. Alternative attractiveness	0.451	-0.104	-0.391	**0.851**			
5. Switch intention	0.337	-0.085	-0.434	0.601	**0.860**		
6. Hedonic value	-0.129	0.544	0.585	-0.272	-0.323	**0.849**	
7. Utilitarian value	-0.111	0.363	0.681	-0.338	-0.428	0.692	**0.831**

Regarding to the issue of common method bias (CMB), we firstly considered minimizing CMB when designing the present study, such as to avoid concept overlap, to demonstrate construct validity, to include reversed items [Podsakoff et al. 2003]. We additionally conducted CMB test. Result of Harman's single-factor test showed that none factors accounted for the majority of the variance [Sharabati et al., 2010]. The un-rotated and principal-component factor analysis did not reveal a dominant factor. The first factor accounted for 18.9% of the variance. All the factors accounted 69.1% of the variance. Therefore, CMB is not a threat in the present study.

5.2.   Structural Model and Hypothesis Testing

We controlled three variables, age, wage and gender to account for possible influences of demographics influences on the constructs in the model. We then examined the path significance and the hypothesized effects. PLS path analytic technique was used to validate the explanatory power of the present model. The overall fit was adequate ($\chi2$ = 573.680 (df = 285, p < .001), RMSEA= 0.059, CFI = 0.924, NFI = 0.903). Perceived value, price tolerance and alternative attractiveness explained approximately 52.3% of the variance in switching intention. While

habit and switch intention jointly explained 26.2% of the variance in continuous usage. The results are presented in table 5 that supported all proposed hypothesis except for H3.

The mediating effect of perceived value in forming switching intention was tested by investigating direct and indirect effect of price tolerance on switch intention. Firstly, we tested the model without the variables related to perceived value, the result shows there is no significant effect between price tolerance and switch intention (0.045, p=0.395). Secondly, we referred to the results shown in table 5 and figure 2 on the relationships among price tolerance, switch intention and perceived value. Price tolerance significantly influence perceived value (-0.075*), perceived value also significantly has an effect on switch intention (-0.833*), while the path coefficient for price tolerance and switch intention is insignificant (0.035, ns). According to the work of Mathieu & Taylor [2006], there exists an indirect effect from price tolerance to switch intention. Perceived value acts as a bridge between price tolerance and switch intention.

Table 5: Results of Hypothesis Testing

Hypotheses	Paths	Coefficient	t-Value	Support
Hypothesis 1	Perceived value(PV)→Switch intention(SI)	-0.083	-1.974*	Yes
Hypothesis 2	Price tolerance(PT)→Perceived value(PV)	-0.075	-1.989*	Yes
Hypothesis 3	Price tolerance(PT)→Switch intention(SI)	0.035	1.311	No
Hypothesis 4	Switch intention(SI)→Continuous usage(CU)	-0.335	-2.067*	Yes
Hypothesis 5a	Habit(HA)→Switch intention(SI)	-0.151	-1.976*	Yes
Hypothesis 5a	Habit(HA)→Continuous usage(CU)	0.465	2.973***	Yes
Hypothesis 6a	Alternative attractiveness(AA)→Switch intention(SI)	0.620	3.830***	Yes
Hypothesis 6b	Alternative attractiveness(AA)→Continuous usage(CU)	-0.159	-2.374**	Yes
Age→switch intention (0.102, p=0.045); Age→switch behavior (0.004, ns); Age→ perceived value (0.054, ns); Gender→ switch intention (-0.033, ns); Gender→switch behavior (-0.080, ns); Gender→ perceived value (-0.05., ns); Wage→ switch intention (0.034, ns); Wage→switch behavior (0.115, ns); Wage→ perceived value (0.026, ns);				
R^2 (CU) = .262 R^2 (SI) = .523	Goodness-of-fit statistics $\chi2$ = 573.680 (df = 285, p < .001); RMSEA= 0.059; CFI = 0.924; NFI = 0.903			
*Denotes significance at the .05 level. **Denotes significance at the .01 level. ***Denotes significance at the 0.001 level.				

5.3. Further Empirical Analysis

While our empirical results suggest that price tolerance has an indirect influence on switch intention through perceived value, it is worth considering the respondents' heterogeneity issues on the effect. For example, the effect of price rise in older respondents may be smaller because the groups of people in high wage ranges are being well paid, and their price tolerance are higher than college students. Alternatively, it is also possible that the effect would be larger in older groups since the young generations are less sensitive to price compared with their parents' generation no matter how much money they earned.

To explore this, we interact price tolerance with age, gender and wage respectively and replicate the estimations. The results are shown in Table 6 below. With the interaction term, price tolerance still has no significant effect on switch intention, which is consistent with our main findings. When it refers to the effect on perceived value, only the interaction term with wage and price tolerance has same significant effect on perceived value, other two interaction effects even become insignificant. Thus, our main findings are validated again through the interaction term.

Table 6: Results of Interaction Effects

	(1) Interact age with price tolerance	(2) Interact wage with price tolerance	(3) Interact gender with price tolerance
PV→SI	-0.073*	-0.075*	-0.062*
PT →PV	-0.095*	-0.075*	-0.104*
PT with interaction term→PV	-0.027^{ns}	-0.087*	-0.029^{ns}
PT→SI	0.022^{ns}	0.025^{ns}	0.104^{ns}
PT with interaction term →SI	-0.001^{ns}	-0.017^{ns}	-0.051^{ns}
*Denotes significance at the .05 level. **Denotes significance at the .01 level. ***Denotes significance at the 0.001 level.			

6. Discussion
6.1. Summary of Findings
The present study is one of the first on the hot topic of car-hailing apps under the context of sharing economy. Drawing on the value-intention framework and Limayem's intention-habit-usage model, this study attempts to investigate the influence of price tolerance on users' switching intention and behaviors in the context of lower subsidy. There are three interesting findings in our present study.

Firstly, the effect of price tolerance on switch intention is not significant, but the relationships between price tolerance and perceived value, perceived value and switch intention are all negative and significant. The indirect relationship was identified. Although hypothesis 1 is supported by the statistical results, the explanatory power of price tolerance is not that high (absolute path coefficients are lower than 0.3, t-values are lower than 3). A possible explanation for this is that although lower subsidy has an indirect influence on users' switch intention, switch intention is not totally influenced by price tolerance.

Secondly, all the antecedents in our model explained 52.3% of variance in switch intention. Especially for alternative attractiveness, the path coefficient is high with 0.620, and the corresponding t-value is 3.830($p<0.001$). Compared with all the antecedents of switch intention those are validated to influence switch intention, the power of alternative attractiveness is among the highest in our present model. Car-hailing app users will consider abandon using the platforms mostly result in the accessibility of the alternatives they have perceived.

Thirdly, another important finding is the relationships between switch intention and continuous usage. Generally, the negative influence of switch intention on continuous usage was supported (path coefficient was -0.335, t value was -2.067, $p<0.05$). However, the results show that habit has the strongest effect on continuous usage (path coefficient was 0.465, t value was 2.973, $p<0.001$). That is to say, users choose to continuous use the platform mostly result from the habit, except for cognitive intention.

6.2. Theoretical Implication
First, this research builds on a group body of studies that examines the relationships among IS usage intention, price tolerance and perceived value [Lin et al. 2012; Choi et al. 2004; Zhou 2013; Kim et al. 2007]. Value-intention framework was validated again to be suitable in our research context [Dodds & Monroe 1985].We focused on the switching from digital channels to the traditional offline channels, which is obviously different from existing works [Woisetschläger et al. 2011; Li & Cheng 2014]. Moreover, orchestrating three perspective of perceived value provides a deeper understanding on the value-intention relationships. Our study is among the first that incorporate hedonic value, utilitarian value and social value into the framework of understanding user switching under the context of sharing economy enabled platforms. Since existing studies scarcely investigated social value as a dimensions of perceived value [Wu & Lu 2013], this research contributes to the current research by investigating three types of perceived value in the context of sharing economy based car-hailing apps.

Secondly, this study examined perceived cost (perceived sacrifice) into the theoretical model. Recognizing the influence of perceived cost on perceived value and user intention, we chose to focus on price tolerance as an evaluation of perceived cost. The results confirmed the indirect effect of price tolerance on switch intention [Hsu et al. 2015]. Since the path coefficient is not that strong, we conclude that subsidies might just be an attracting strategy for some users but not the key motivation to continuous usage intention.

Moreover, our findings show that the antecedents of switch intention is rather complex. Apart from the constructs originated from value-intention framework [Hsu 2014], alternative attractiveness was validated to strongly influence users' switch intention. Different from previous studies that incorporate alternative attractiveness as switching barriers [Jones et al. 2002; Ghazali et al. 2016], the present research complements literatures in this fields of IS switching from a n alternative perspective, and serves as a demonstration on the understanding of user switching from electronic online channels to the traditional ones.

The last contribution of our study is the investigation of actual user behavior. Prior studies in the area of IS switching have mostly focused on the intention [Park & Ryoo 2013; Chou et al. 2016; Zhang et al. 2012], but has left user behavior study into future research [Xu et al. 2014]. Drawing on the Limayem's intention-habit-usage model [Limayem et al. 2007], the study contribute to the stream of research by showing the explanatory power of habit, alternative attractiveness, switch intention to continuous usage. The strong role of habit was supported in the context of sharing economy enabled car-hailing apps. This study corroborates the notion that habit can be considered as a goal-directed automatic and natural behavior in the IS research [Yin & Zhu 2014]. Therefore, we contend that habit should not be overlooked when conducting related IS studies.

6.3. Practical Implication

The research model in this study can also be of assistance to companies that engage in sharing economy based IS companies. Firstly, IS usage and switch intention are strategic issues for business operators. As the two car-hailing apps giant in China merged together, the subsidy provided to consumers are becoming lower. It is somewhat surprising that price tolerance does not have a direct influence on switch intention. Thus, the operators should come up with other effective ways to attract users and maintain customers rather than the subsidy itself. In addition, our results show that price indirectly has an effect on switch intention, but the coefficient is relatively low. On the contrary, the effect of alternative attractiveness on switch intention is more significant. Thus, in order to better maintain users, the companies are encouraged to sharpen their edge to compete in the battle with traditional taxi, for example, to provide convenient responses, to promote map guidance, and to standardize the management of registered drivers.

When it comes to understanding switch intention, perceived value also plays a critical role. The experience nature of car-hailing services requires the perception of value after a trial. On account that we are discussing user switching rather than technology acceptance, the utilitarian value, the hedonic value and the social value all serve as determinants of switch intention. Thus, operators could offer more facilities to the users and improve the reliabilities of their registered drivers, and improve usefulness and functionality of car-hailing services to promote the perception of utilitarian values. To cater to users' perception of social value, the operators could, for example, build an online forum to connect the end users and perfect the online reviews of the car-hailing apps. Moreover, the perceived playfulness should be considered to facilitate users' perception of hedonic value.

Thirdly, as the use of IS systems is sometimes a habitual behavior, users' habit to the platforms become pivotal to the IS success that facilitate continuous usage behavior. Sometimes, even though the users' perceived intention is relatively low, the platforms still have a long way to improve themselves. However, once users' habit is built, they will automatically continuous to use the system. This finding provides practical implications to operators to come up with solutions regarding to habit formation. The natural and non-intentional feature of habit exert an important role in the IS usage behavior.

6.4. Limitations and Future Research

Several limitations should be addressed. First, since most of the participants are below 30 years old, the generalizability of the present study is somewhat limited. Since the young adults normally shared lower wages than the old ones, their perception to price and price tolerance level are different to some degree. Thus, future studies are encouraged to recruit more participants with diverged age groups, and list age, wage and gender as control variables to conduct deeper analysis. Moreover, since those chose to respond survey online are "technology-adaptors" who are less likely to switch from e-hailing to traditional way compared to other people. In future research, a wider range of sampling strategy is required to avoid the possible biases.

Secondly, we focused on users switching of car-hailing apps, but just officially collected questionnaire data for one time. Future studies are encouraged to conduct longitudinal investigations and compare users' perception between different periods of time. In this way, switching behavior can be measured empirically and objectively.

Thirdly, this study incorporates price tolerance as the perceived cost that eventually influences value perception. Since previous models regarding to value-intention framework generally take perceived cost and perceived benefit into account, our present research requires further improvement. According to the results of this research, the explanatory power of price tolerance is not that high. Thus, future studies should pay attention to more variables that may provide more comprehensive understanding of user switching on car-hailing apps. Other features in car-hailing apps, such as trust and motivation, are also encouraged to be explored in the future research.

7. Conclusion

This study addressed the issue of user switching on car-hailing apps in the sharing economy era. Based on the value-intention framework and the intention-habit-usage model, this present paper adds to the exiting body of research on IS user switching, switch intention and the actual behavior are both investigated. The proposed model was validated through survey analysis. Habit and alternative attractiveness are highlighted to be important on the

perception of user switching and the continuous usage behavior respectively. The role of price tolerance on perceived value and switch intention are validated, but the relatively weak path coefficient provides theoretical and practical clues for operators to come up with new strategies except for the subsidy.

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