

# Understanding consumer continuous usage intention of ride-hailing services: a model based on efficacy and hostility attribution theory

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**Abstract:** The general adoption of ride-hailing services is contingent on removing the negative media's influence and improving consumers' willingness to use them in the future. It is very important for ride-hailing platforms and governments to promote users' willingness to continue using and retain consumers. On the basis of efficacy theory and adversarial attribution theory, combined with perceived risk and trust, The goal of this study is to figure out what factors influence women's propensity to continue utilizing ride-hailing services. We conducted data analysis on 400 respondents by means of questionnaire survey and structural equation model. Our empirical results suggest that efficacy theory and adversarial attribution theory can provide a strong basis for investigating the continued willingness of female consumers to adopt ride-hailing services. Trust is positively correlated with continuous usage intentions. Self-efficacy and proxy efficacy are positively correlated with trust, while hostile attributional style is negatively correlated with trust. Proxy efficacy is negatively correlated with hostile attributional style. In addition, perceived risk positively affected self-efficacy, and proxy efficacy positively moderated the relationship between self-efficacy and trust.

**Keywords:** Perceived Risk; Self-efficacy; Proxy Efficacy; Hostile Attributional Style; Trust; Continuous Usage Intentions

## 1. Introduction

Ride-hailing services, also known as ride-sharing, vehicle rental, or on-demand ride services, are exemplary instances of the sharing economy, in which people with private cars provide trips to the public for a reasonable price. (Contreras et al., 2018) <sup>[1]</sup>. The best-known ride-hailing platforms are Didi Chuxing, Uber and Lyft in China.

Although taxi-hailing service has brought great convenience to people's life, the ensuing safety problems have also been exposed, and many sad accidents have occurred. Many incidents were widely reported and caused an uproar in public opinion, which had a major impact on the public's view of ride-hailing services' risks, which may affect consumers' willingness to continue using such services in the future. Therefore, under the influence of negative news, how to change passengers' opinion on the company, how to reduce risks and how to improve the regulatory mechanism are urgent problems.

Reviewing the literature, many scholars have studied users' willingness to keep utilizing a product or service. (Groß, 2016<sup>[2]</sup>; Ma, et al. 2019<sup>[3]</sup>). In the field of transportation services, most published studies focus on consumers' risk perception and trust in platforms (Ma, et al. 2019) <sup>[3]</sup>; the continuing usage intentions of riders who use a mobile taxi booking application service (Weng, G.S. et al.)<sup>[4]</sup>. In attribution theory, most of the research is to discuss the characteristics of people in the workplace that affect their willingness to work (Martinko et al. 2001) <sup>[5]</sup>; In EPPM theory, most studies discuss the relationship between risk control, self-efficacy and proxy efficacy (Witte, 1992<sup>[6]</sup>; Witte, et al. 1996<sup>[7]</sup>). Therefore, in the above theoretical studies, few can combine the actual risk with their own characteristics from the perspective of users, and can use the theory of hostile attribution to discuss the intention to continue using taxi service

In this study, we choose the perspective of female users to discuss their perception of risk, their trust in the platform, and their own and third-party platform capabilities in the case of frequent negative news, so as to judge their willingness to utilize the service again in the future.

In sum, this study takes the negative news of Taxi service in China as the background to investigate how consumers are affected, such as risk perception, self-efficacy, proxy efficacy, attribution style and other factors, to discuss users' trust in taxi platform and their willingness to continue using it in the future.

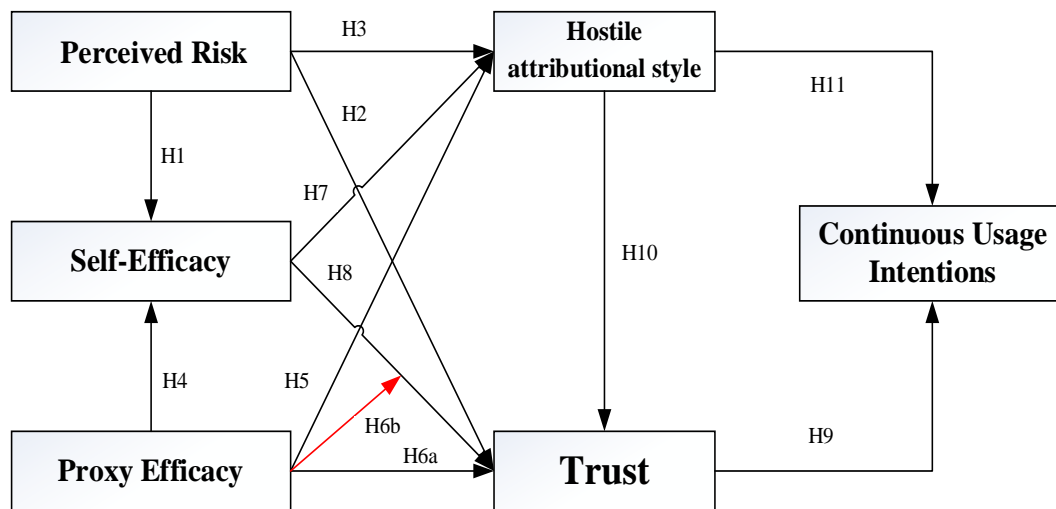


Figure 1: Theoretical framework

## 2. Research model and hypothesis development

### 2.1 Perceived risk

The concept of risk perception was first proposed by Bauer (1960)<sup>[8]</sup>, and it is defined as "the subjective perception that consumers need to bear the negative results of a certain brand or product after purchasing it". Risk perception consists of two important components, uncertainty and losses (Cox, D.F. and Rich, S.U.,1964)<sup>[9]</sup>. In this paper, the risk perceived by users in the process of using ride services are mainly physical, financial and psychological risk.

Witte's papers (Witte K., 1992<sup>[6]</sup>; 1994<sup>[10]</sup>) constructed an extended parallel process model (EPPM) in his paper to explain the moderating effect of an individual's perceived ability to resist threats on perceived risk and preventive actions. Based on EPPM, Rimal N. and Kevin R. (2003)<sup>[11]</sup> introduced the risk perception attitude Framework (RPA) and concluded that self-protection behavior would be affected by risk perception and efficacy through comparative experiments.

Based on the above literature research, we can speculate that when users perceive high risks, they may take corresponding protection measures to improve their self-protection awareness and thus improve their self-efficacy to cope with risks. Therefore, we propose a hypothesis:

**H1: Perceived risk is positively related to self-efficacy.**

Many research has explored the correlation between perceived risk and user trust, (Paapas, 2016<sup>[12]</sup>; Slovic, 2010)<sup>[13]</sup> and they all come to the same conclusion: the higher the perceived risk, the lower the feeling of trustworthiness (Chang, et al. 2017<sup>[14]</sup>; Chin, et al. 2018<sup>[15]</sup>; Kim, G. et al. 2016<sup>[16]</sup>). We propose the following hypothesis based on the above literature:

**H2: Perceived risk is negatively related to trust.**

In attribution theory, individuals are assumed to be "naïve psychologists" who have a natural urge to figure out what causes the outcome they're dealing with (Heider, F.,2013)<sup>[17]</sup>. Attribution theory holds that individuals seek to determine the cause of negative events, assess responsibility, and learn from experience to avoid similar events in the future. As with all perceptions, however, the attributions individuals form is not always an objective assessment of reality (Dobbins, G.H. &Russell, J.M.,1986<sup>[18]</sup>; Jones, E.E. & Nisbett, R.E.,1971<sup>[19]</sup>) and may include an emotional component of self-perception.

Based on the above logic, we infer the relationship between perceived risk and hostile attributional style. First, as opposed to trust, when perceived risk is high, people tend to be more platform responsible for surprises and risks. Secondly, the risks that may occur in the ride services mentioned in this paper

and perceived by users are all based on the imperfections of the platform mechanism and the failure of functions. As a basis, we provide the following hypothesis:

**H3: Perceived risk is positively related to hostile attributional style.**

## 2.2 Proxy efficacy

The assumption that a third party actively participates in the achievement of personal goals is referred to as proxy efficacy. (Dzewaltowski, D.A. et al. 2007) <sup>[20]</sup>. In this paper, proxy efficacy refers to the user's confidence in the platform's ability to ensure secure services.

Bandura (1977) <sup>[21]</sup> pointed out that an individual's proxy efficacy could influence his or her self-efficacy, and these two efficacies could affect the individual's behavior regarding a specific goal and produce behavioral changes.

Self-efficacy will motivate individuals to take protective actions, while proxy efficacy will enhance their belief to achieve goals when individuals cannot solve problems, such as public health emergencies, and the government's ability to control and control will make individuals more confident in fighting against the epidemic (Li, X., 2018) <sup>[22]</sup>.

Therefore, we speculate that when a crisis occurs, self-efficacy can improve its own risk awareness and take certain protective actions. As a supplementary part of self-efficacy, proxy efficacy can have a positive impact on self-efficacy to a certain extent. Therefore, we propose the hypothesis:

**H4: Proxy efficacy is positively related to self-efficacy.**

We use logic to investigate the association between proxy efficacy and hostile attributional style in this study. It can be seen that proxy efficacy is based on personal trust in the platform, which is just opposite to hostile attribution. When the proxy efficacy is high, it means that users have high confidence in the platform to make supervisory decisions, so the degree of hostile attribution of users may be reduced. Therefore, we propose the hypothesis:

**H5: Proxy efficacy is negatively related to hostile attributional style.**

The confidence that proxy agents facilitate an individual's goal fulfillment can decrease the individual's perceived difficulty of a challenging task (Shields, C.A., et al. 2007)<sup>[23]</sup> and increases his or her satisfaction and willingness to continue to participate in activities (Lent. R.W. et al. 2002) <sup>[24]</sup>.

Based on the above research, we conclude that proxy efficiency means that users have full trust in the functions performed by the platform. When the proxy efficiency is high, consumers' trust in the platform increases. Therefore, we propose the hypothesis:

**H6a: Proxy efficacy is positively related to trust.**

Based on the above literature research, it can be seen that both self-efficacy and alternative efficacy may be closely related to trust. However, Collective efficacy and proxy efficacy moderate the effect of self-efficacy on danger control results (Li, X. 2018) <sup>[22]</sup>. Therefore, we propose the following hypothesis:

**H6b: The effect of self-efficacy on trust is moderated by proxy efficacy, and such an effect is stronger if the proxy efficacy is stronger.**

## 2.3 Self-efficacy

Self-efficacy (Bandura, 1977) <sup>[21]</sup> refers to a person's perception of his or her ability to respond with suggestions to reduce threats (Witte, K.,1996<sup>[25]</sup>; Witte, K. et al., 2001<sup>[26]</sup>). In this paper, self-efficacy refers to the confidence of users to ensure their own safety in the process of using taxi services.

hostile attributional style, as a relatively stable personality trait, strongly affects negative situation and influence the resulting behavioral reaction (Hoobler, J.M. et al., 2006) <sup>[27]</sup>. Furthermore, hostile attributional style is a type of distorted thinking that assigns the worst motivations to a certain incident (Milich, R. et al., 1984) <sup>[28]</sup>. Therefore, people with a strong sense of self-efficacy will affirm their own ability when confronted with a specific danger, and attribute the possibility of the danger to the external, attributed to the platform controllable attribution reasons. Building on above reasons, we proposed:

**H7: Self-efficacy is positively related to hostile attributional style.**

In previous studies, self-efficacy and trust were usually studied as separate variables related to risk

perception (Rimal, R.N. et al., 2003<sup>[11]</sup>; Neuwirth, K. et al., 2000<sup>[29]</sup>), However, in terms of brand trust, some scholars have verified that self-efficacy has a significant indirect positive impact on trust (Chen, Z.F. et al., 2019)<sup>[30]</sup>. Building on above reasons, we proposed:

**H8: Self-efficacy is positively related to trust.**

#### **2.4 Trust, hostile attributional style and continuous usage intention**

Existing literature suggests that trust is an important factor in an individual's continued willingness to use a product or service (Marriott, H.R. et al., 2018<sup>[31]</sup>; Ma, L. et al., 2019<sup>[3]</sup>). Most studies show that trust affects customer satisfaction (Kim, D.J. et al., 2009)<sup>[32]</sup>, while highly satisfied users will remain loyal (Yuen, K.F. et al., 2018)<sup>[33]</sup> and continue to use them (Groß, M., 2016)<sup>[2]</sup>. Based on the former study, Users are more likely to continue using Didi platform if they trust it.

**H9: Trust is positively related to continuous usage intention.**

Hostile attribution is a generally consistent personality trait that has been defined as a non-punitive mentality in which people are more likely to blame others. (Adams, S.H. et al., 1997)<sup>[34]</sup>. In the present study, individuals with hostile attributional style tend to make external, stable, intentional causes for negative outcomes (Douglas, S.C. et al., 2001)<sup>[35]</sup>. Here, we follow this logic to explore the relationship of hostile attributional style and trust.

**H10: Hostile attributional style is negatively related to trust.**

According to previous study, people with hostile attribution styles are more likely to blame their issues at work on peers, supervisors, organizational policies, and other stable, externally controlled elements. (Douglas, S.C. et al., 2001)<sup>[35]</sup>. It is expected that this type of attributional tendency will promote heightened turnover intention (Harvey, P. et al., 2008)<sup>[36]</sup>. It can be inferred from the above literature that when users have such a strong hostile retreat style, they will blame the platform for the risk, so we propose the following hypothesis:

**H11: Hostile attributional style is negatively related to continuous usage intention.**

### **3. Method**

#### **3.1 Data Collection/Sample and procedures**

In response to the social incidents of single female taxi victims, relevant regulatory departments and taxi software platforms have issued relevant policies to reduce the social influence brought by social incidents and ensure the safety of female taxi drivers alone.

Therefore, we adopted an online questionnaire to investigate whether single women are still willing to use taxi-hailing software after knowing a series of relevant social events.

After a pilot survey, a revised questionnaire sent out by the internet platform of WenJuanXing via WeChat. The demographic descriptions reveal that 58.3% of the respondents are aged between 18 and 25 years, approximately 73.3% have a college degree.

#### **3.2 Measurements**

Five-point scales were used to evaluate the constructs in the study. The survey was conducted entirely in Chinese. We employed the typical back-translation process to translate the measurements into Chinese because they were initially established in English. (Brislin, R.W., 1980)<sup>[37]</sup>.

### **4. Results**

Most of factor loading are above 0.7. The measurement model shows acceptable fit. All AVE scores are above the benchmark value of 0.5. Thus, convergent validity is reached. Based on the preceding analysis, we can conclude that the measurement model fits the data well.

Table 1: Confirmatory factor analysis results for measurement model.

	Items	Factor Loading	S.E.	C.R.	p	Cronbach's Alpha	Composite Reliability	AVE
Perceived risk	Perceived risk 1	0.801	0.175	5.184	* * *	0.852	0.854	0.596
	Perceived risk 2	0.838	0.209	5.335	* * *			
	Perceived risk 3	0.782	0.165	8.924	* * *			
	Perceived risk 4	0.655						
Self-efficacy	Self-efficacy 2	0.649	0.403	4.397	* * *	0.852	0.779	0.542
	Self-efficacy 3	0.741	0.163	4.815	* * *			
	Self-efficacy 4	0.809						
Proxy efficacy	Proxy efficacy 1	0.745	0.067	10.74	* * *	0.813	0.878	0.644
	Proxy efficacy 2	0.827	0.069	12.744	* * *			
	Proxy efficacy 3	0.816	0.065	13.98	* * *			
	Proxy efficacy 4	0.818						
Locus of causality	Locus of causality 1	0.846				0.808	0.887	0.723
	Locus of causality 2	0.843	0.244	5.571	* * *			
	Locus of causality 3	0.862	0.183	4.331	* * *			
Stability	Stability 1	0.871				0.852	0.911	0.773
	Stability 2	0.895	0.103	9.277	* * *			
	Stability 3	0.872	0.071	15.942	* * *			
Continuous usage intentions	Continuous usage intentions 1	0.896	0.082	13.215	* * *	0.875	0.924	0.802
	Continuous usage intentions 2	0.88	0.096	12.434	* * *			
	Continuous usage intentions 3	0.91						
Trust	Trust 1	0.844	0.061	13.78	* * *	0.786	0.879	0.707
	Trust 2	0.861	0.073	13.24	* * *			
	Trust 3	0.817						

The descriptive statistics and Pearson correlation coefficients among perceived risk, self-efficacy, proxy efficacy, trust, hostile attributional style (include locus of causality and stability) and continuous usage intentions are presented in Table 2. The result show inter-correlations among the variables are below 0.8. The VIF values ranged from 2.957 to 4.925, which was found to be below the cutoff threshold of 5.0, thereby indicating that multicollinearity is not an issue in our analysis.

Table 2: Means, standard deviation, and correlations of the constructs

Variables	Means	SD	1	2	3	4	5	6
Perceived risk	3.638	0.584	1					
Self-efficacy	4.204	0.531	0.270***	1				
Proxy efficacy	3.667	0.632	-0.042	0.085*	1			
Trust	3.293	0.613	0.013	0.152**	0.064***	1		
Continuous usage intentions	3.746	0.612	-0.014	0.194***	0.0412***	0.490***	1	
Hostile attributional style	3.765	0.560	0.248***	0.059	-0.247***	-0.323***	-0.182***	1

Table 3 presents the chained multiple mediating effects of Self-efficacy and Hostile attributional style on trust. These findings indicated that perceived risk could indirectly increase trust through self-efficacy, and reduce trust through hostile attributional style.

Table 3: Regression results of the mediating role of self-efficacy and hostile attributional style

	Model 1 Self-efficacy	Model 2 Hostile attributional style	Model 3 Trust
(Constant)	-0.223 (-1.080)	-0.024(-0.109)	-0.028(-0.121)
Age	0.039 (1.2723)	-0.065*(-1.978)	0.098**(2.840)
Occupation	-0.000 (-0.009)	0.009(0.270)	-0.021(-0.630)
Education	0.042(0.817)	0.058(1.084)	-0.063(-1.118)
Perceived risk	0.239*** (5.411)	0.242*** (4.998)	0.050(0.967)
Self-efficacy		-0.004(-0.083)	0.173**(3.125)
Hostile attributional style			-0.354***(-6.729)
Adjusted R <sup>2</sup>	0.078	0.080	0.163
F	8.298	6.804	12.794

Table 4: Regression results of the mediating role of trust

	Model 1 Trust	Model 2 Continuous usage intention
(Constant)	-0.111 (-0.483)	-0.504* (-2.357)
Age	0.111** (3.199)	0.028 (0.864)
Occupation	-0.020 (-0.567)	0.031 (1.254)
Education	-0.048 (-0.835)	0.118* (2.231)
Hostile attributional style	-0.330*** (-6.401)	-0.034 (-0.676)
Trust		0.480*** (10.263)
R <sup>2</sup>	0.136	0.252
F	15.481	26.509

Table 4 presents the regression model of the mediating role of trust. The results indicated a significant indirect effect of hostile attributional style on continuous usage intention, and 95% bias-corrected confidence intervals for the indirect effect did not cross 0 (BootLLCI=-0.225, BootULCI=-0.107). These findings indicated that hostile attributional style could indirectly reduce continuous usage intention through trust.

Table 5 indicated regression result of the moderating role of proxy efficacy. Consistent with Hnumber, proxy efficacy has a positive and significant effect on both trust ( $\beta=0.635$ ,  $p<0.001$ ) and the relationship between self-efficacy and trust ( $\beta=0.083$ ,  $p<0.05$ ). Figure 2 also demonstrates that the higher the proxy efficacy will lead to the stronger this relationship.

Table 5: Regression results of the moderating role of proxy efficacy

	Model 1 Trust	Model 2 Trust
(Constant)	-0.046(-0.254)	-0.080(-0.444)
Age	0.123**(2.991)	0.124*(3.015)
Occupation	-0.056(-0.769)	-0.048(-1.176)
Education	-0.031(-0.769)	-0.025(-0.621)
Self-efficacy	0.090*(2.438)	0.097**(2.617)
Proxy efficacy	0.642*** (17.187)	0.635*** (17.036)
Self-efficacy × Proxy efficacy		0.083*(2.254)
Adjusted R <sup>2</sup>	0.459	0.465
F	68.824	58.794

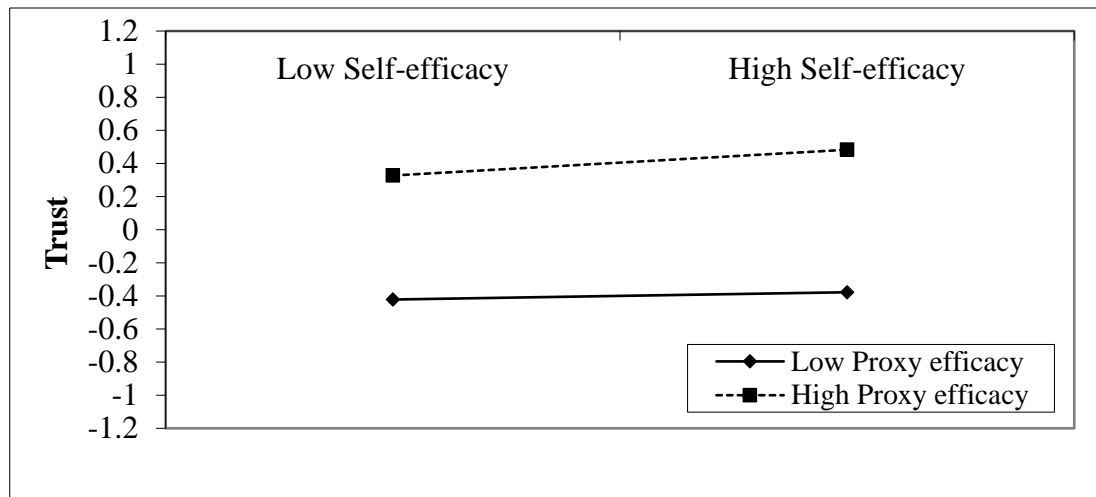


Figure 2: The moderating effect of proxy efficacy

## 5. Discussion and conclusions

The results demonstrate that: (1) Users' trust in ride-hailing platforms is significantly influenced by self-efficacy and proxy efficacy, while hostile attributional style has a large negative impact. (2) Hostile attributional style is positively influenced by perceived risk, while proxy efficacy has a significant negative impact. (3) Self-efficacy is significantly influenced by perceived risk. (4) Users' trust in taxi-hailing platforms has a positive impact on their willingness to continue using them in the future.

In various ways, the findings of this study add to the current literature. The first is the link between self-efficacy and perceived risk, the moderating effect of substitute efficacy and self-efficacy, and trust mentioned in this paper extend the existing EPPM theory. Secondly, this study expands previous research on attribution theory by investigating the impact of risk perception and proxy efficiency on hostile attributional style.

This research has important practical significance for taxi platforms and female users of taxi services. From the conclusions verified by our study, it can be found that proxy efficacy will significantly affect users' trust in the platform and users' attribution of hostility. Therefore, when negative events occur, it is necessary to eliminate negative information, but the most important thing is that the platform itself needs to improve its own functions, strengthen management, reduce its own loopholes, so that users can continue to use in the future and maintain loyalty.

The research has significant limitations. First and foremost, despite our best efforts to guarantee that the sample is representative, the sample is still a convenient sample of female consumers, which limits the universality of the research results, and there may be differences between users' behavioral intentions and actual actions. Therefore, practical application behavior can be further investigated in future studies to provide complementary results. Secondly, the number of variables is too large, and the relationship is complicated. Some of the causal relationships need longitudinal study, and more rigorous conclusions are given.

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Yezi Yang conceived the idea of the study, analyzed the data and wrote the paper. Wei Wang performed the experiments.

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