Digital Platform Expectation Disconfirmation and Customer Satisfaction in Sharing Economy: Moderations of Direct and Indirect Network Effects

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Digital Platform Expectation Disconfirmation and Customer Satisfaction in Sharing Economy: Moderations of Direct and Indirect Network Effects

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¹ School of Economics and Management, China University of Geosciences, China

Abstract: Digital platform in sharing economy is increasingly focusing on customer satisfaction to gain sustainable competitive advantage. However, existing understandings of how network effects shaped the creative process of customer satisfaction are not well-understood in the information system field. Based on the expectation-disconfirmation theory, we proposed a conceptual model to elaborate on the roles of direct and indirect network effects on digital platform customer satisfaction. We test our model using survey data from 250 sharing economy platform customers. The key results of structural equation modeling (SEM) provide broad support for the following: (1) the effect of customer expectation on confirmation is completely dependent on the mediation of perceived performance in digital platform of sharing economy, and (2) the direct and indirect network effects contribute as the moderator at different stages of the model. We discuss the theoretical and practical implications of how managers should effectively develop and leverage the network effects to improve the digital platform customer satisfaction in the context of sharing economy.

Keywords: Digital platform, Sharing economy, Expectation-disconfirmation theory, Customer satisfaction, Network effects

1. INTRODUCTION

Over the past few years, sharing economy provides the digital space in which service providers use their privately-owned resources (e.g. physical and nonphysical goods and services) via digital platforms to serve their customers[¹, ²]. This emergent business model also initiates re-examining traditional views on resources consumption, the flow of resources among different digital platforms has become more frequent, the theory of obtaining competitive advantages by relying on the non-fluidity or technical barrier has been greatly challenged in the context of sharing economy. Structurally, the sharing economy network is peer-like in nature, with the aim of benefiting and relying on a large number of active customers[³]. Customers, with the explosive propagation on the platform, become the base of value creation and acquisition. Understanding the digital platform (hereon DP) customer satisfaction is critical for managers to make effective and targeted strategic decisions.

For the focus of customer satisfaction, related literature of the expectation–disconfirmation theory (hereon EDT) provide critical constructs to describe the forming process of web-customer satisfaction[⁴]. However, the expectation–disconfirmation relationship of customers may change as the innovation of the business model. And previous theoretical framework limits our ability to delineate the potential new relationship and to explain the possible changes which may be occurred by interactions between digital platform and customers. Therefore, the first focus of this paper is to study the creative process of DP customer satisfaction for the sharing economy.

In the digital platform era, the term “network effects”, known as network externalities referring to an additional value of a commodity or service to others[⁵], is gaining prominence. Previous research has indicated the importance of network effects on customers’ adoption attitude to the sharing economy platform[⁶]. To make network effects useful for customer operations, it is crucial for platform managers to understand how to take advantage of network effects in customer attraction and retention. Even so, there is still a lack of understanding

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of the difference between the roles of direct and indirect network effects in sharing economy, and how customer satisfaction is affected by network effects. Thus, our second target of this study is to uncover the moderation role of network effects on the creative process of DP customer satisfaction in sharing economy.

We seek to contribute to a theory of customer satisfaction that takes into account both expectation-disconfirmation theory and network effects. Specifically, we first focus on the measurement of the constructs for developing potential links in the creative process of DP customer satisfaction by the model of EDT. Additionally, we argue that network interaction in two key dimensions—direct network effects and indirect network effects affect customer satisfaction. By identifying two types of network effects as moderators of the expectation-disconfirmation-satisfaction relationship, we propose the research framework to try to answer questions as follows: (1) Based on EDT, are there any new variable links to the DP customer satisfaction in sharing economy? (2) How do different network effects moderately affect the expectation-disconfirmation model and DP customer satisfaction respectively?

2. LITERATURE REVIEW

2.1 Customer satisfaction in IS field

Customer satisfaction is used to describe customers’ emotional reaction to a product or service[5]. Studies in the IS field currently refer to this concept as a significant determinant of IT continue use[6]. Among the studies, the theoretical frameworks mainly include the IS success model[7] and the EDT[3,8].

IS success model is proposed to indicate the basic determinants including information quality, system quality, and service quality are critical for repurchase intention[9]. The ultimate success of IS depends on customers’ continuance which is based on increasing satisfaction. McKinney et al. integrated EDT with IS success model’s framework to decompose web-customer satisfaction[3]. Recent researches on customer satisfaction in IS field usually add related constructs on the basis of IS success model framework or EDT according to specific application scenarios, such as trust, perceived usability, perceived individual benefit.

The digital platform, as an emergent phenomenon in IS field, is with reference to an online foundation or base on common components around which a company might build a series of products. Exchanges in platform-mediated networks have an interactive structure in which customers trade with each other while affiliating with platform providers. The digital platform facilitates value-creating interactions among platform participants and strong customer self-organization, which content’s generation is highly distributed and decentralized[10]. The influence of these opportunities on customer satisfaction is also different in the platform environment against the traditional IS environment[11]. Prior studies have indicated that high-quality product information has a statistically significant impact on customer satisfaction, which is related to product information, and website design is an important determinant of customer formation[12].

2.2 Network effects in sharing economy

With the development of digital technology and social network, more research began to discuss the role of digital platforms in the sharing economy[13], and network effects of sharing economy is being an important theme in IS studies.

Network effects, also known as network externalities, refer to an additional value of products or services to others[14]. Broadly speaking, the fundamental benefits provided by sharing economy are not traditional products or services, but the way to get a vast customer network. As the network grows, the level of the product quality will also improve, so that the growth can be self-feedback. Previous research indicates that network effects play the role of improving customers’ usage intention in the operation of platform-based services. If customers predict that they will have a larger market share based on the criteria they currently use, they will be less willing to give up the value created by a huge customer base, and therefore less willing to switch[14].
Network effects can generally be divided into two categories: direct network effects and indirect network effects. Direct network effects are described that: With the expansion of the customer base, the product becomes more valuable. Previous studies have indicated that the size of network can be seen as a basic characteristic of network effects, which depend on the number of other network customers interacting with the network\(^{[14]}\). Besides, indirect network effects result from the availability of complementary goods and services. When a product or service network increases, it may in turn increase the value of a complementary product or network.

The value of network effects on the sharing economy platform is also well-recognized. However, most articles only study network effects as an overall conception on the platform, or even do not distinguish between them. Studies investigate direct and indirect network effects simultaneously and how two types of network effects influence sharing economy DP customer satisfaction are limited. Although sharing economy and customer satisfaction research continues increasing development, the structure and characteristics of digital platform may change the relationship of customer satisfaction creation. And previous theoretical framework limits our ability to delineate the potential new relationship and to explain the possible changes which may be occurred by interactions between platform and customers. In order to fill this gap, this study is to explore a new research model to examine the creative process of DP customer satisfaction in the context of sharing economy.

3. **THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT**

3.1 **Expectation-disconfirmation theory**

Expectation-disconfirmation theory (EDT) was originally designed for analyzing customers’ behavior to investigate customer satisfaction and post-purchase behaviors\(^{[8]}\). EDT indicated that customers first generate an original expectation of a product/service prior before purchasing. After making the purchase decision and using it for a period, customers will form the perceived performance of the product/service. When perceived performance surpasses expectations, confirmation generates a positive emotion (e.g. pleased), while negative emotion (e.g. frustrated) is the result of expectations exceeding perceived performance. EDT is applied diffusely in many fields. For example, Bhattacherjee indicated that EDT based constructs can explain the continuance intention among online banking customers\(^{[8]}\). In recent IS research, theoretical and conceptual frameworks of EDT were increasingly developed. Most of which have been integrated with IS or IT variables, such as information quality, perceived usability, trust.

![Figure 1. Research model](image-url)
In this paper, we argue that IT-enabled information and resource flows among customers in digital platform trigger the expectation-disconfirmation for customer experience, and then affect customer satisfaction. We also argue that network effects can magnify the creative process of customer satisfaction. Thus, based on EDT, we integrate direct and indirect network effects into the generation process of customer satisfaction and propose a research model (see figure 1). This model depicts that DP customer satisfaction, created through customers’ "expectation-disconfirmation" variables in a digital platform, with positively moderation of direct and indirect network effects. This model also describes a full-mediation link among DP customer expectation, DP perceived performance, and DP confirmation. Experience and frequency variables are used as control variables for customer satisfaction. The definitions of the main variables are shown in table 1.

### Table 1. Definitions of variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP Customer Expectation</td>
<td>When customers consider engaging a digital platform, they form their expectations by collecting and applying previous and present information and knowledge</td>
<td>Venkatesh &amp; Gopal 2010[15]; Oliver 1980[5]; McKinney et al. 2002[3]</td>
</tr>
<tr>
<td>DP Perceived Performance</td>
<td>Customers’ perception of how digital platform performance fulfills their needs, wants and desires</td>
<td>McKinney et al., 2002[3]</td>
</tr>
<tr>
<td>DP Confirmation</td>
<td>Customers’ subjective judgments after comparing their expectations and their perceptions of performance received</td>
<td>McKinney et al. 2002[3]; Bhattacherjee 2001[8]</td>
</tr>
<tr>
<td>DP Customer Satisfaction</td>
<td>Customers’ emotional state response to the entire digital platform website usage and service experience</td>
<td>Oliver, 1980[51]; McKinney et al. 2002[3]</td>
</tr>
<tr>
<td>Direct Network Effects</td>
<td>Direct network effects arise when the benefit of network participation to user depends on the number of other network users whom they can interact</td>
<td>Lin &amp; Huang 2014[14]</td>
</tr>
<tr>
<td>Indirect Network Effects</td>
<td>An increase in usage of a product or network result in an increase in the value of a complementary product or network, which in turn can add value of the original</td>
<td>Zhou &amp; Lu 2011[16]</td>
</tr>
</tbody>
</table>

### 3.2 Theoretical hypotheses

Previous research on digital service has demonstrated that confirmation has a positive influence on customer satisfaction[17]. Given that this relationship is well established in the literature, we mainly theorize about it in the context of the sharing economy digital platform. It is worth note that EDT is tested in specific contexts, however, few studies verify this relationship in digital platform scenarios. we hypothesize that:

**H1:** In the context of digital platform, DP confirmation has a positive impact on DP customer satisfaction.

When customers consider purchasing products, they usually collect previous information about purchasing experiences from other customers, then establish interior comparison criteria, thus forming their expectations[5, 15]. In the context of IT usage, customers’ pre-usage cognition (e.g. attitude, beliefs) is generally from second-hand information, which in turn expresses customers’ initial expectations. As time goes by, when customers obtain first-hand experience using IT, they would assess their initial perceptions are consonant or inconsistent with practical experience[18]. According to previous research, the role of perceived performance in EDT has become a comparative criterion for the degree of confirmation of expectations[3].
However, when customers gain new information about the platform by observing other customers’ experiences, they may continually adjust their expectations\textsuperscript{[19]} which may result in no direct relationship between expectations and disconfirmation\textsuperscript{[18]}. Besides, the online searching experience can also influence customer expectations, customers know what kind of service they will get in advance and are less likely to be angry or surprise at the service they received\textsuperscript{[11]}. The content in the digital platform is decentralized and customer-generated, and customers’ expectations of the platform before use are mainly generated from second-hand information, which will weaken the direct impact of expectations on inconsistency. Some EDT studies take for ultimate outcome evaluations (confirmation or disconfirmation) according to the direction and magnitude of the gap between customer expectations and perceived performance, then final results are inclined to the direction of perceived performance\textsuperscript{[20]}. Thus, we deduced that DP disconfirmation or confirmation is a result of the comparison between expectations and perceived performance in the context of sharing economy. Thus, we hypothesize that:

H2: In the context of sharing economy, the effect of DP customer expectation on DP confirmation is completely dependent on the mediation of DP perceived performance.

The direct network effects caused by the increasing scale of customers have a certain influence on the reputation and the effectiveness of the platform itself. This may moderate the process by which customers compare expectations with perceived performance. Meanwhile, indirect network effects caused by increasing in complements and additional services is something that customers can’t expect before they use it. This may affect the process by which customers end up generating satisfaction from confirmation or disconfirmation. Thus, we contend that two network effects act on different phases of customer satisfaction generation.

The greater the direct network effects, the greater the value of the product creates for customers. Positive network effects occur when customers spread their valuable information to others. If a product or service becomes dominant, there will be a herd effect with people rushing to purchase the product or service, especially when making choices in an information overload environment. Others’ purchase behavior may highlight its strengths and encourage potential customers to imitate the purchase behavior. Customers tend to share technical knowledge by interacting with people in their social networks\textsuperscript{[14]}. Therefore, information from other customers significantly impacts the effect of DP perceived performance on DP confirmation. We hypothesize that:

H3: The higher direct network effects are, the stronger influence of DP perceived performance on DP confirmation is.

Network effects are often based on the hypothesis that: customers preferred platforms with more participants, meanwhile, participants’ motivation and desire for development will be stronger for a platform with multitudinous customers. More complementary goods increase customers’ demand (and vice versa), producing network effects and winner-take-all outcomes\textsuperscript{[10]}. When the diversity of products and services in one platform increases, they will be more likely to continually use this platform. Abundant complement goods produce indirect network effects and boost the network value. For example, the number of apps available in Google Play is increasing as the Android smartphone customer base grows\textsuperscript{[14]}. In the context of digital platform, payment methods, security insurance, positioning effect, promotions are significant complements provided by the ridesharing platform. Szymanski & Henard indicated that aspects related to product information are important factors of customer satisfaction. Indirect network effects bring sharing economy platform more abundant complement service, which will promote the influence of confirmation on customer satisfaction\textsuperscript{[12]}. Thus, this study proposes that a larger customer base in sharing economy platform will create and accumulate more value of complimentary service and information, which can in turn influence customer satisfaction, we hypothesize that:

H4: The higher indirect network effects are, the stronger influence of DP confirmation on DP customer satisfaction is.
4. METHODOLOGY

4.1 Construct Measurement

We confirmed the construct measurements by combing prior literature in order to make a survey and collect data on the use of sharing economy platforms. The variables were measured with multi-item, five-point Likert scales, which are illustrated in the Appendix.

*DP customer satisfaction* is an emotional state response to the entire digital platform website usage and service experience\(^3, 5\). To create instruments for measuring the construct in this study, based on the practice of sharing economy platform, we adopt three measurement items from the factors of McKinney for web-customer satisfaction. Respondents were asked to evaluate their satisfaction with the given ridesharing platform on the following aspects: pleasure, content, delight.

*Customer expectations, perceived performance, and confirmation* are key constructs in EDT, which is well known in behavior research. Confirmation is measured in the EDT literature in three ways: objective, inferred and perceived. Because EDT pays attention to customers’ subjective judgments of product or service, thus, this study measured perceived performance and confirmation. Based on McKinney’s study, we adopt four dimensions to measure related constructs refer to access, usability, information usefulness, and service\(^3\).

*Direct Network Effects and Indirect Network Effects.* The scale of direct network effects developed by Lin & Huang, was used to assess the degree of interaction of network participation. Performance regarding the customer scale and the market occupancy was measured as factors for measuring direct network effects to construct. According to Boudreau & Jeppesen\(^10\), we design four items anchored as “payment method”, “positioning effect”, “security insurance” and “promotions” to measure indirect network effects.

Additionally, we specify usage experience and usage frequency as control variables in our research.

*Usage experience.* As customers’ experiences in the use of the sharing economy platform increases, their prior cognition may be revised iteratively\(^18\). Experienced customers may not have more potential expectations, and are therefore more likely to be satisfied with the platform.

*Usage frequency.* For customers in the platform, higher interaction frequency may lead to longer relationship duration. Customers with a more enduring relationship with the platform are more likely to be satisfied.

4.2 Questionnaire Development and Data collection

Given that the popularity of sharing accommodation platforms such as Airbnb is not high in China, the target population of this study is individuals that have experience using ridesharing platforms. All respondents are allowed to usage experience on at least one of the following ridesharing platforms: DiDi or Uber.

To test the research hypotheses proposed in the model, we designed a questionnaire. After pretesting the questionnaire to assess content validity and convergent validity, we sent final questionnaires through PC and smartphone to obtain data. The survey yielded 302 responses, and 250 of them were valid. We conducted a difference test on questionnaires distributed, and the results showed that there was no significant difference (\(p>0.05\)) in the methods of questionnaires distributed in different ways. Most respondents own a good educational level. Students (70.8%) make up the majority of the sample. About 62% of those respondents had a usage experience over 1 year, 61.2% of respondents use ridesharing service 1-3 times per week. According to the analysis results of descriptive statistics, most respondents are familiar with sharing economy platform. Therefore, the respondents’ understanding of the questionnaire is convincing.

To exclude common method variance, this study accepted Harmon’s one-factor tests to evaluate common method variance. Through the test, a single factor accounted for only 38.12% of the variance, which was less than 50%. The result suggests that a common method bias isn’t considered an issue in our model.
5. RESULTS

5.1 Measurement model

We use SPSS 25 and Smart PLS 3.0 to test the measurement model by the analysis of reliability and validity. Firstly, the result indicated that KMO statistic was 0.888. Bartlett’s test passed the test at the significance level of 0.001, and the cumulative explanatory variance rate of the model was 70.743%. For the reliability of items, we use Cronbach’s alpha to test whether the data is reliable. Also, composite reliability (CR) is tested to ensure the reliability of the items. All results were above the acceptable value of 0.70. The validity of constructs was accessed by examining CR and Average Variance Extracted (AVE) values. All AVE values are significantly larger than the recommended value of 0.50. Table 2 showed the results of convergent and discriminant validity. Each item was loaded on its designated factors with all items’ values was greater than the acceptable value of 0.40. The inter-correlation value between constructs was lower than the square root of AVE for every construct (see Table 3). Thus, the research model demonstrated satisfactory reliability and validity.

<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>Indicators</th>
<th>Loadings</th>
<th>Cronbach’s α</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP Customer Expectation (DPCE)</td>
<td>DPCE 1</td>
<td>0.777</td>
<td>0.874</td>
<td>0.914</td>
</tr>
<tr>
<td></td>
<td>DPCE 2</td>
<td>0.846</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPCE 3</td>
<td>0.828</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPCE 4</td>
<td>0.817</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP Perceived Performance (DPPP)</td>
<td>DPPP 1</td>
<td>0.731</td>
<td>0.835</td>
<td>0.890</td>
</tr>
<tr>
<td></td>
<td>DPPP 2</td>
<td>0.667</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPPP 3</td>
<td>0.743</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPPP 4</td>
<td>0.738</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP Confirmation (DPC)</td>
<td>DPC 1</td>
<td>0.648</td>
<td>0.813</td>
<td>0.877</td>
</tr>
<tr>
<td></td>
<td>DPC 2</td>
<td>0.718</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPC 3</td>
<td>0.809</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPC 4</td>
<td>0.741</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP Customer Satisfaction (DPCS)</td>
<td>DPCS 1</td>
<td>0.650</td>
<td>0.805</td>
<td>0.885</td>
</tr>
<tr>
<td></td>
<td>DPCS 2</td>
<td>0.674</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPCS 3</td>
<td>0.601</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Network Effects (DNE)</td>
<td>DNE1</td>
<td>0.762</td>
<td>0.799</td>
<td>0.908</td>
</tr>
<tr>
<td></td>
<td>DNE2</td>
<td>0.787</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect Network Effects (IDNE)</td>
<td>IDNE1</td>
<td>0.697</td>
<td>0.781</td>
<td>0.860</td>
</tr>
<tr>
<td></td>
<td>IDNE2</td>
<td>0.717</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IDNE3</td>
<td>0.680</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IDNE4</td>
<td>0.518</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Results of discriminant validity.

<table>
<thead>
<tr>
<th></th>
<th>DPCE</th>
<th>DPPP</th>
<th>DPC</th>
<th>DPCS</th>
<th>DNE</th>
<th>IDNE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPCE</td>
<td>0.853</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPPP</td>
<td>0.516**</td>
<td>0.819</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPC</td>
<td>0.182**</td>
<td>0.487**</td>
<td>0.801</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPCS</td>
<td>0.326**</td>
<td>0.516**</td>
<td>0.564**</td>
<td>0.849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNE</td>
<td>0.375**</td>
<td>0.446**</td>
<td>0.380**</td>
<td>0.595**</td>
<td>0.912</td>
<td></td>
</tr>
<tr>
<td>IDNE</td>
<td>0.363**</td>
<td>0.506**</td>
<td>0.533**</td>
<td>0.650**</td>
<td>0.594**</td>
<td>0.778</td>
</tr>
</tbody>
</table>

Note: ** denotes p < 0.01. Numbers on the diagonal are the positive square roots of the average variance extracted (AVE) values; off-diagonal values are the estimates of inter-correlation between the latent constructs.
5.2 Structural model

Figure 2 shows the path coefficients of the research model. Specifically, DP perceived performance was positively linked with DP confirmation ($\beta = 0.543$, $p < 0.001$), DP confirmation was positively linked with DP customer satisfaction ($\beta = 0.576$, $p < 0.001$). DP customer expectation ($\beta = 0.536$, $p < 0.001$) was detected to have statistically positively correlated with DP perceived performance. However, DP customer expectation was not found to have a significant relationship toward confirmation. Thus, H1 was supported.

5.3 The mediating effect

The mediating effect of DP expectation informing DP confirmation was examined by accessing the direct and indirect effect of DP perceived performance on DP confirmation. The result is shown in Table 4. Firstly, we tested a model that excluded perceived performance. The results present a significant effect of DP expectation on confirmation ($\beta=0.168$, $p<0.001$). Secondly, we included DP perceived performance into analysis then validated these relationships among DP expectation, DP perceived performance and DP confirmation. The result shows that DP perceived performance influences DP confirmation ($\beta=0.521$, $p<0.001$), however, DP expectation has an insignificant effect on DP confirmation ($\beta=-0.087$, $p>0.05$). The effect of expectation toward confirmation is completely dependent on the mediation of perceived performance. Thus, H2 is accepted.

5.4 Moderation effect

The moderation effects of direct network effects and indirect network effects were tested. We centralized the moderating variables and dependent variables and constructed the product term with the centralized value, then it is included in the regression of dependent variables, and hierarchical regression is carried out.

Table 4. The mediating effect analysis.

<table>
<thead>
<tr>
<th>path</th>
<th>B</th>
<th>SE</th>
<th>R²</th>
<th>Sobel</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPCE $\rightarrow$ DPC(c)</td>
<td>0.168**</td>
<td>0.058</td>
<td>0.033</td>
<td></td>
</tr>
<tr>
<td>DPCE $\rightarrow$ DPPP(a)</td>
<td>0.490***</td>
<td>0.052</td>
<td>0.266</td>
<td></td>
</tr>
<tr>
<td>DPPP $\rightarrow$ DPC(b)</td>
<td>0.521***</td>
<td>0.063</td>
<td>0.244</td>
<td></td>
</tr>
<tr>
<td>DPCE $\rightarrow$ DPC(c')</td>
<td>-0.087</td>
<td>0.060</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Sobel= $a \cdot b / \sqrt{(b^2 \cdot SE_a^2 + a^2 \cdot SE_b^2)}$; SE means standard error; ** denotes $p < 0.01$, *** denotes $p < 0.001$.

Figure 2. PLS results of research model (***$p < 0.001$)

Figure 3 shows...
Table 5. Moderation effect analysis.

<table>
<thead>
<tr>
<th></th>
<th>The moderation effect model of DNE</th>
<th>The moderation effect model of IDNE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1 ($\beta$)</td>
<td>Model 2 ($\beta$)</td>
</tr>
<tr>
<td>DPPP</td>
<td>0.487***</td>
<td>0.396***</td>
</tr>
<tr>
<td>DNE</td>
<td>0.203**</td>
<td>0.228***</td>
</tr>
<tr>
<td>DPPP×DNE</td>
<td>0.180***</td>
<td></td>
</tr>
<tr>
<td>DPC</td>
<td>0.564***</td>
<td>0.304***</td>
</tr>
<tr>
<td>IDNE</td>
<td>0.489***</td>
<td>0.494***</td>
</tr>
<tr>
<td>DPC×IDNE</td>
<td>0.136**</td>
<td></td>
</tr>
<tr>
<td>D-W</td>
<td>1.753</td>
<td>1.739</td>
</tr>
<tr>
<td>VIF</td>
<td>1</td>
<td>1.248</td>
</tr>
<tr>
<td>F</td>
<td>77.003***</td>
<td>45.685***</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.234</td>
<td>0.264</td>
</tr>
</tbody>
</table>

Note: ** means $p<0.01$, *** means $p<0.001$

In addition, the correlation of experience use on DP customer satisfaction is not significant ($\beta=0.004; p>0.05$), which may be the result of customers are more focused on the current stage of use, customer satisfaction will not be changed by the customer experience usage. The usage frequency’s results ($\beta=0.038; p>0.05$) provided evidence that frequent use can’t lead to higher customer satisfaction.

6. DISCUSSION

This study has sought to explain the question of how, and under what condition, the DP customer satisfaction forms in the context of sharing economy moderating by network effects. Unlike most prior perspectives which have indicated the direct relationship between DP customer expectation and confirmation on expectation-disconfirmation model [20], we argue that DP perceived performance acts as a complete mediator between DP perceived expectation and DP confirmation (Sobel=6.22, $p<0.001$) for sharing economy platform. Additionally, this study distinguished two kinds of network effects as moderators at different phases of the research model. Direct network effects were validated as a moderator between DP perceived performance and confirmation, and indirect network effects were validated as a moderator between DP confirmation and customer satisfaction. The sharing economy platform with higher direct network effects will have a more widely spread reputation and be more valuable to customers, which will magnify the results of the comparison of DP customer expectations and perceived performance. The sharing economy platform with larger indirect network effects will bring value
beyond expectation to customers who have already compared with expectation and perceived performance to generate confirmation, and the additional value will strengthen the effect of confirmation generates satisfaction.

6.1 Theoretical contributions

Our findings advanced EDT and network effect literature in several ways.

First, this study supplemented the EDT in the aspect of digital platform and validates confirmation or disconfirmation still acts as an important influence factor in the sharing economy platform context. Importantly, this study found the influence of DP customer expectation on DP confirmation is completely dependent on the mediation of DP perceived performance. In the traditional EDT\textsuperscript{[5]} and IS literature\textsuperscript{[3, 10]}, perceived performance usually has a partially mediating role between customer expectation and confirmation, but which is designed for traditional business rather than sharing economy platform. Sharing economy platform is a highly standardized, the dissemination of information with high accuracy and personalized service makes the information obtained by customers before use more real than the traditional situation, which will make the customer's expectation more practical. This study suggests that DP customer satisfaction evaluations rest with the direction and magnitude of the gap between expectations and perceived performance, owning perceive performance provide critical forces to realize confirmation.

Second, our study illustrated how network effects promote the creation of DP customer satisfaction and extended their importance in the sharing economy context. We bridged the gap between EDT and network effect literature by demonstrating the moderation role of network effects plays at different phases of the model. This finding contributed to the advancement of the network effects in sharing economy by understanding the importance of focusing on different characteristics of network effects and explaining when and how they play a critical role in facilitating the creation of DP customer satisfaction. These findings extended the EDT literature and provided a new perspective for future study of the feature of sharing economy platform.

6.2 Implication for practice

In terms of practical implications for platform managers, our model would help the practitioners to clarify the forming process of sharing economy platform customer satisfaction and more accurately grasp the change mode of the customer psychological state.

The introduction of EDT for digital platform will make managers realize that the management of customer expectation alone cannot play a significant role in customer satisfaction under the sharing economy situation. In other scenarios, it is generally recommended to improve customer satisfaction by raising or lower customer expectations. The results of this study prove that this way is no longer applicable to the operation and management of sharing economy platform. Instead, managers should pay attention to the confirmation of customer expectations and improve the performance of the platform to meet or even exceed customer expectations, so as to obtain customer satisfaction and realize their continued use of the platform. This study suggests that managers stimulate the intrinsic motivation of customers such as enjoyment, fun and flow experience. These elements should be reflected in the platform website’s design to enhance customers' perceived performance.

The findings of this study unveil the mechanism by taking advantage of network effects is useful to improve DP customer satisfaction. The actions of increasing direct effect, like social network marketing, award forwarding, can be more used in influencing customers. Similarly, DP customer satisfaction is affected by the moderation of the indirect network effect. It shows a positive feedback effect in the platform-mediated network. The implication for managers is that it should take effective measures to attract more service providers and expand the customer scale, encourage customers to register in the platform and use relative service. The platform can bring additional value to customers on the basis of customers' recognition of basic services by optimizing the interface, providing personalized services. This will promote customer satisfaction towards the platform, which in turn will improve the scale of platform and thus bring greater value to the platform and customers.
7. LIMITATIONS AND FUTURE RESEARCH

Several limitations should be considered when interpreting the findings. All questionnaires are filled by Chinese responders, the results may not be universal to countries with different cultures. Therefore, it’s necessary for future studies to collect a more extensive customer base to test the generalizability of our results. In addition, other characteristic constructs of sharing economy platform, such as trust, may also influence the formation of customer satisfaction. Future research can consider taking these constructs into the research model.

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APPENDIX. MEASUREMENT ITEMS

(5-point Like Scale, 1 = Strongly Disagree, 5 = Strongly Agree)

**DP Customer Expectation**

CE1: I expect that the platform provides good access.
CE2: I expect that the platform is customer-friendly.
CE3: I expect information on the platform to be useful in my purchase decision.
CE4: I expect the platform provide a dependably and prompt ridesharing service.

**DP Perceived Performance**

PP1: I reckon that the platform provides good access.
PP2: I reckon that the platform was customer-friendly.
PP3: I reckon that the platform performance in providing information is useful in my purchase decision.
PP4: I reckon that the platform performance in providing a dependably and prompt ridesharing service.

**DP Confirmation**

CONF1: Access provided by the platform is better than my expectations.
CONF2: The difficulty of using the platform is easier than my expectations.
CONF3: Information provided by the platform in my purchase decision is more useful than my expectations.
CONF4: Ridesharing service provided by the platform is better than my expectations.

**DP Customer Satisfaction**

CS1: After using the platform, I am very pleased.
CS2: After using the platform, I am very contented.
CS3: After using the platform, I am very delighted.

**Direct Network Effects**

DNE1: Compared to the traditional trip mode, I predict that the platform will have more customers in the future.
DNE2: I predict that the market share of the ridesharing network will grow constantly in the future.

**Indirect Network Effects**

INDE1: The platform provides a richer payment method.
INDE2: The platform provides a more convenient positioning effect, making it easier to find nearby vehicles.
INDE3: The platform provides a richer set of security insurance to ensure the security of payment and travel.
INDE4: The platform continues to launch scene-based promotions, such as shopping vouchers.
REFERENCES


