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## The Effect of Transport Amenities on Customer Satisfaction: An Empirical Study from the Online Travel Community

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### ABSTRACT

Few studies thus far have examined add-on services associated with mitigating hotel location disadvantages. Drawing on the Elaboration Likelihood Model, we in this study consider the variety of transport amenities as a peripheral cue and propose an econometric model that explores the impact of the transport amenities on customer satisfaction. We estimate the model using 187447 reviews assembled from a well-known online travel community in China. The results show that the variety of transport amenities has a significant positive impact on customer satisfaction. Furthermore, we find that the travelers' type and transport convenience have a moderating effect on this relationship. From the perspective of the three-factor theory, we further reveal that the transport amenity is a basic factor for business travelers but an excitement factor for leisure travelers. A variety of robustness tests show that the conclusion of this study is robust.

*Keywords:* Transport amenity, elaboration likelihood model, service variety, three-factor theory.

### INTRODUCTION

Location is regarded as one of the most important determinants of customer satisfaction in the hospitality sector (Rhee & Yang, 2015). A hotel owning an ideal location can have privileged access to external resources in this area, bringing potential convenience for customers (Li et al., 2015). Thus, a traveler will consider many factors to ensure a thorough investigation about the convenience of a hotel's location before purchasing (Chou, Hsu, & Chen, 2008). Among these factors, transport convenience has long aroused great interest of researchers (Yang & Mao, 2020; Yang, Mao, & Tang, 2018). On the one hand, greater transport convenience can save time and cost (Canina, Enz, & Harrison, 2005; Yang et al., 2018). On the other hand, greater transport convenience can strengthen the "tourist environmental bubble". The "tourism environment bubble" is similar to a protective wall, which can isolate travelers from the risks and inconveniences caused by the strangeness of the destination (Cohen, 1972).

However, location is a fixed attribute of a hotel, and it is difficult to change once chosen. Even though the location convenience of hotels has received considerable attention before construction, hoteliers still seem to be very passive because of the uncertainty associated with changes in the surrounding environment. Observing hotels in the city of Xiamen, China, Bégin (2000) found that the transition of the CBD and development of new tourist sites during the past two decades had made significant changes to the distribution of hotels. The old core of the city, once preferred by hoteliers, had become phased out. Alternatively, New development of the hospitality industry generated in the area with recreational activities recently opened, and the building of important infrastructures also led to generators of tourism traffic.

Fortunately, hoteliers can cope with this environmental change by providing transport amenities. As a type of add-on service, transport amenities can solve "the last mile" for customers during travel, further improving the perceived transport convenience, enhancing customer experience, and remedying location disadvantages (Yang et al., 2018). As such, the transport amenity is consistently reported by guests as an essential branch of hotel amenities. For example, research among 56,727 travelers commissioned by Booking.com (2017) reported that shuttle/taxi service to the airport/city center and parking were rated the fifth and the sixth most crucial hotel amenity, respectively. In addition, Expedia Group (2020) surveyed 34,000 travelers and reported that parking and shuttle were amenities that mattered for business travelers. In response to the importance of transport amenities, hoteliers always place transport amenities in a prominent position on the hotel reservation page.

Having noted all this, little attention has been paid to the peripheral cues driving customer satisfaction. To our best knowledge, prior studies mainly focused on the impact of central cues (e.g., service quality) on customer satisfaction. This lack of research prevents hoteliers from identifying and proposing well-grounded strategies to offer amenities because most amenities do not need to have too high quality but need to be more diversified in order to meet the taste of different customers. To fill this

important gap, this research is concerned with the variety of transport amenities, and our main research questions are the following: 1) Are the more transport amenities provided, the better? 2) Do hotels in a good location need to provide more transport amenities? 3) When should hoteliers use free pricing, and who is the target of offering transport amenities?

To answer these questions, we collected a data set from Ctrip, one of the most authoritative online travel communities, and the findings of our study have several important contributions. First, our study reveals the usefulness of transport amenities for both hotels with location advantages and hotels with location disadvantages. We find offering more transport amenities can significantly improve customer satisfaction. In addition, we examine travelers' profiles in moderating this relationship. The result indicates that, compared with leisure travelers, business travelers pay more attention to the variety of transport amenities. Our findings also advance the literature by adopting the three-factor theory in this study. We use the variety instead of the rating to represent the evaluation of an attribute and indicate that the transport amenity is a basic factor for business travelers but an excitement factor for leisure travelers. Further, our findings support previous studies about the zero-price effect phenomenon in the hospitality industry.

## LITERATURE REVIEW

### Hotel Attributes and Amenities

Marketing literature defines attributes as multiple dimensions of a product or service. All products and services can be treated as a package of attributes or characteristics that influence consumer choices (Armstrong et al., 2014). When consumers evaluate a product or a service, their choice is primarily driven by the performance of the product or service's attributes (Kucukusta, 2017). Researchers have identified various attributes that impact customers' purchase behavior and determine their satisfaction in the hotel industry, such as location, price, service, amenity, and room cleanliness. (Bi et al., 2020; Han, Hsu, & Sheu, 2010; Kucukusta, 2017; Soifer, Choi, & Lee, 2021; Yang et al., 2018; Ye et al., 2014).

Hotel amenities can be identified as services or products offered to customers as a part of their overall hotel stay and have become one of the essential value creation attributes of a hotel (Kucukusta, 2017). The hotel amenity now covered in academic research can be mainly divided into two categories: in-room amenities and out-of-room amenities. For in-room amenities, researchers suggested that Wi-Fi has the highest important value compared with other amenities (Heo & Hyun, 2015; Kucukusta, 2017), and free charge of it can significantly enhance customers' perceived value and drive their satisfaction (Liu et al., 2020; Soifer et al., 2021). In addition, Masiero, Heo, and Pan (2015) reported that the effect of other in-room amenities, such as telephone services and free mini-bar items, varies from travelers in different contexts. Hotel amenities out of the room, also called property, are generically referred to as facilities, services, and specific hotel policies such as swimming pool, business center, breakfast, and a pet-friendly policy (Kucukusta, 2017). The transport amenity is a vital aspect of hotel amenities out of the room; among them, parking and airport shuttle are the most frequently studied. For example, Liu et al. (2020) showed that free parking positively impacts customers' perceived value. However, this positive effect is attenuated by vertical competition and higher-grade horizontal competition. Kucukusta (2017) reported that airport/local area shuttles rank the second most crucial among price, wireless Internet, breakfast, and quality of coffee/tea. Kim et al. (2017) indicated that free parking and airport shuttle are two decisive factors to predict customer satisfaction, price premium, and revisit intention. Lin (2017) found that low-end hotels will follow high-end hotels to offer add-on services with moderate marginal cost (e.g., airport shuttle) as optional.

Two deficiencies can be recognized in prior studies. First, though existing research has referred to traditional transport amenities such as parking and airport shuttle, there remained a gap in a more detailed guidance strategy for hoteliers to leverage transport amenities. Second, offering transport amenities has endogenous problems because we can never observe a hotel with and without transport amenities simultaneously. Previous studies treated amenities as exogenous or used coarse matching to fix endogenous problems, which would bring potential bias to the research result. Thus, it's necessary to use a more accurate model to remedy the problem.

### Characteristics of Business Travelers

In tourism research, the topic regarding the difference of business travelers' behavior patterns and preferences has long raised great interest (Chu & Choi, 2000; Gundersen, Heide, & Olsson, 1996; Gustafson, 2012, 2014). The poor sleep quality, busy schedule, traveling alone and limited opportunities to go sightseeing are regarded to be the potential reasons for shaping their common characteristics (Burkholder et al., 2010; Chen et al., 2018; Medina-Muñoz, Medina-Muñoz, & Suárez-Cabrera, 2018; Striker et al., 1999). Many researchers have identified the negative rating bias of business travelers (Banerjee & Chua, 2016; Radojevic, Stanic, & Stanic, 2015). However, Radojevic et al. (2018) found that amenities related to convenience and room can efficiently moderate this adverse effect. Additionally, recent studies also supported business travelers' emphasis on convenience, room, and sleep quality before and after their accommodation experience. For example, Wang et al. (2020) highlighted that business travelers are more impacted by in-room amenities than other travelers. Rhee et al. (2015) showed that sleep and room rank the first and the third most vital attribute for business travelers. Rohani, Aung, and Rohani (2017) indicated that business travelers would prefer a hotel with more business facilities, for example, speedy check-in/out procedure, wake-up call service, airport service, etc. Yang et al. (2018) presented a result that near metro and freeway can only significantly improve business travelers' customer satisfaction compared with others.

Although prior studies reported some transport amenities (e.g., parking) as antecedents and moderators for business travelers' customer satisfaction (Herjanto, Erickson, & Calleja, 2017; Rohani et al., 2017; Yang et al., 2018), they have focused essentially on the linear (or symmetric) relationship between a single transport amenity and customer satisfaction. It is necessary to take a whole picture about the meaning of this type of amenity for business travelers instead of focusing on a point. We aim to use the variety of transport amenities to expand the research scope and try to investigate the asymmetric relationship between transport amenities and customer satisfaction and examine if this relationship varies from travelers in different contexts.

### **Elaboration Likelihood Model and Customer Service Evaluation**

The Elaboration Likelihood Model (ELM) is a psychological theory that describes the way people process persuasive information, thereby changing their behavior or attitude. ELM is a "dual-process" theory that consists of two routes: the central and the peripheral routes. When using the central route to process information, people will carefully scrutinize the information with more effort spent. In contrast, the peripheral route often relies on superficial and straightforward cues without giving too much effort (Petty & Cacioppo, 1986).

Many scholars have successfully applied the Elaboration Likelihood Model to information processing of online reviews and identified some key characteristics of online reviews related to two routes. Generally, researchers have considered that users processed the online reviews about the quality of products using the central route, while quantity cues and source credibility of electronic word-of-mouth (eWOM) are often processed through the peripheral route (Cheung, Lee, & Rabjohn, 2008; Lee, Park, & Han, 2008; Park, Lee, & Han, 2007; Watts & Zhang, 2008). As such, prior studies mainly focused on information processing during purchase based on ELM (Cao et al., 2017; Li, Zhang, & Han, 2021). Few studies have noticed that customers also use dual routes to process the post-purchase experience. Though service quality as a central cue has been widely identified as a driver of customer satisfaction (Olorunniwo, Hsu, & Udo, 2006; Wang, Lo, & Yang, 2004), little attention has been paid to peripheral factors that change customers' attitudes.

To our best knowledge, limited studies apply ELM in hospitality (Filieri & McLeay, 2014; Hardy, Vorobjovas-Pinta, & Eccleston, 2018; Harris, Taylor Jr, & DiPietro, 2021; Hur et al., 2017; Kang & Namkung, 2019; Leung, Lyu, & Bai, 2020; Li et al., 2017; Lu & Gursoy, 2015; Meng & Choi, 2019). Although the above studies testified to the validity of the ELM in IT adoption, food safety, virtual reality advertising, food O2O commerce, crowdfunding ventures, and location-based service adoption, none were concerned with the process to evaluate hotel stay experience.

### **HYPOTHESIS DEVELOPMENT**

Many researchers have reported that greater service variety will drive customer satisfaction (Carins, Rundle-Thiele, & Ong, 2020; Kwun, Ellyn, & Choi, 2013; Singh, 2004). A high-variety strategy can increase customer satisfaction from three aspects. First, it's more likely for customers to find suitable services at the beginning. Second, it can satisfy customers' need for freshness over time (variety-seeking behavior). Last but not most important, more diversified services can make a good impression on customers through improving perceived variety whether they use it or not. Though prior studies expressed some worries concerning plentiful but similar service options even bring a negative consumption experience (Kahn & Lehmann, 1991), it won't disturb our hypothesis. Transport amenities provided by hotels are very diversified, involving all aspects of public transportation (e.g., airport, station, taxi, bus). Thus, each additional transport amenity will significantly increase customer satisfaction through enhancing perceived variety. Therefore, we hypothesize the following:

#### **H1. The variety of transport amenities positively affects customer satisfaction.**

In addition, transport convenience has become a critical dimension of hotel location satisfaction. Transport convenience refers to how easy it is for customers to leave and return to the hotel using local transportation. Various transport amenities can hugely make up for hotels' location disadvantage (Yang et al., 2018). Even for hotels with high transport convenience, transport amenities can bring customers a more comfortable experience by offering customizing services and improving perceived variety. Therefore, we hypothesize the following:

#### **H2. For hotels with high or low transport convenience, more various transport amenities significantly improve customer satisfaction.**

Prior studies found that business travelers always own a stressful schedule (Doyle & Nathan, 2001; Espino et al., 2002; Gustafson, 2012, 2014; Unger, Uriely, & Fuchs, 2016) and have feelings of disorientation, loneliness, and isolation (Cohen & Gössling, 2015). A more convenient hotel can better support their work-related obligations and reduce their negative emotions; thus, many prior studies have found that business travelers would emphasize convenience in their trips. For example, Chu et al. (2000) found that "convenience for the business" ranges highest in the importance of a group of American business travelers. Yavas and Babakus (2005) indicated that business travelers view convenience as the second most crucial attribute, second only to general facilities. Radojevic et al. (2018) showed that the choice of business travelers is often influenced by the transport convenience of the hotel location. Besides the location convenience of the hotel, transport amenities are also a vital aspect to compensate for hotel convenience. Therefore, we hypothesize the following:

H3. Business travelers moderate the positive effect of the variety of transport amenities on customer satisfaction. The positive impact of the variety of transport amenities increases if the traveler is a business traveler.

## METHODOLOGY

### Data and Variables

#### Data source

We obtained our data from ctrip.com. Ctrip is one of China's most popular online travel communities, widely used as a data source in previous studies (Chen et al., 2019). To improve the generalization of our results, we randomly selected 201 hotels in China's top 10 tourism cities voted by travelers. In the hospitality industry, many studies have confirmed that the epidemic will modify consumer behavior (Herédia-Colaço & Rodrigues, 2021; Li, Yao, & Chen, 2021; Zheng, Luo, & Ritchie, 2021). To ensure that consumer behavior does not change severely, in September 2020, we used Python to crawl the reviews one year before the COVID-19, between January 2019 and December 2019, and 201 hotels' profiles. We deleted the reviews from reviewers who traveled alone or booked for others. The main reason is that there is no clear definition of travel context for these two types, which may bring bias to our research. In addition, we deleted the hotels that Ctrip did not show the distance to the nearest metro station. Finally, we got 187447 reviews covering 201 hotels in China's top ten tourism cities. We directly or through calculation got three-dimensional variables of review level, reviewer level, and hotel level.

Table 1: Operationalization and type of variables.

Variable Name	Operationalization
<b>Dependent variable</b>	
Overall_Rating	Overall ratings provided by reviewers on Ctrip
<b>Researched variable</b>	
Trans_Amenity_Vairety	The number of transport amenities provided by the hotel is shown on the hotel reservation page by Ctrip
<b>Moderator</b>	
Business_Traveler	1 if the traveler is a business traveler, 0 otherwise
Transport_Convenience	The centralized distance from the hotel to the nearest metro station
<b>Control variable—review\reviewer level</b>	
User_Grade	Ctrip membership is an advanced contributor program of Ctrip that evaluates reviewers' contributions to Ctrip. Reviewers' membership level appears in the traveler's profile and includes six levels
User_Avatar	1 if the traveler uses his or her own picture as the user avatar, 0 otherwise
Travel_Type	A group of dummy variables of user travel type(business, family, friend, lover)
System_Name	1 if the traveler renames the user name generated automatically by Ctrip, 0 otherwise
Lnreview_Length	The logarithm of the total number of words in a review
Temporal_Distance	Months between the user's check-in date and review's post date
This_Review_Pic_Total	Picture number contains in a review
<b>Control variable—hotel level</b>	
Quality	Combining hotel aspect ratings covering service, environment, cleanliness, facility by principal component analysis
Price_Mean	The average price of all rooms in a hotel
Room_Num	The total number of hotel rooms
Monthly_Neg_Review_Num	Bad reviews are received by the hotel every month
Monthly_Pic_Review_Num	Reviews with pictures received by the hotel every month
Hotel_Grade	Hotel level, a total of 4 levels: Level 2 includes two stars / two diamonds, level 3 includes three stars / three diamonds, level 4 includes four stars / four diamonds, and level 5 includes five stars / five diamonds. Star grade rewarded by professional institutions, diamond grade rewarded by Ctrip, according to the standards of professional institutions
Lnhotel_Num	The logarithm of the number of other hotels within one kilometer around the hotel

**Instrumental variable**

Airport_Distance	The distance from the hotel to the nearest airport
Station_Distance	The distance from the hotel to the nearest express railway station

**Additional analysis**

Free_Trans_Amenity_Variety	The number of transport amenities with a free label provided by the hotels shown on Ctrip
Low_Trans_Amenity_Variety	1 if the hotel doesn't provide any transport amenities, 0 otherwise
High_Trans_Amenity_Variety	1 if the hotel doesn't provide any transport amenities, 0 otherwise
Charge_Trans_Amenity_Variety	The number of transport amenities without free label provided by the hotels shown on Ctrip

**The dependent variable, research variables, and control variables**

On Ctrip.com, each review is attached with an overall rating. Prior studies have widely used the overall rating as a proxy of customer satisfaction (Bulchand - Gidumal, Meli3n - Gonz3lez, & L3pez - Valc3rcel, 2011; Mariani & Borghi, 2018; Ye et al., 2014). Therefore, we used the overall rating as our dependent variable. As for the independent variable, we chose the number of transport amenities to represent the variety of transport amenities. As mentioned in section 3, the increase in service variety needs not only the increase in service quantity but also the increase in service diversity. Transport amenities provided by hotels are very diversified, involving all aspects of public transportation (e.g., airport, station, taxi, bus). So we can use the number of the service to represent the variety of the service directly.

Table 2: Descriptive statistics of all variables.

	Num	Mean	SD	Min	Max
(1) Price_Mean	187,447	830.3	581.5	134.6	6,175
(2) This_Review_Pic_Total	187,447	0.409	1.336	0	9
(3) User_Grade	187,447	1.467	0.633	1	3
(4) User_Avatar	187,447	0.623	0.485	0	1
(5) Room_Num	187,447	196.1	118.4	11	760
(6) Transport_Convenience	187,447	0.605	0.646	-.699	4.270
(7) Airport_Distance	187,447	25.77	14.47	0.450	134.0
(8) Station_Distance	187,447	8.353	9.748	0.140	73.10
(9) Hotel_Grade	187,447	3.989	0.776	2	5
(10) Monthly_Neg_Review_Num	187,447	8.443	10.66	0	142
(11) Monthly_Pic_Review_Num	187,447	27.49	28.37	0	258
(12) Temporal_Distance	187,447	0.813	1.761	0	12
(13) System_Name	187,447	0.317	0.466	0	1
(14) Business_Traveler	187,447	0.369	0.483	0	1
(15) Trans_Amenity_Vairety	187,447	2.866	2.010	0	9
(16) Free_Trans_Amenity_Variety	187,447	1.109	1.249	0	6
(17) Lnhotel_Num	187,447	4.215	0.839	0	4.820
(18) Lnreview_Length	187,447	3.206	1.026	1.099	6.215
(19) Overall_Rating	187,447	4.775	0.563	1	5
(20) Quality	187,447	0.091	1.892	-7.590	2.916
(21) Low_Trans_Amenity_Vairety	187,447	0.075	0.264	0	1
(22) High_Trans_Amenity_Vairety	187,447	0.012	0.109	0	1
(23) Charge_Trans_Amenity_Variety	187,447	1.757	1.713	0	8

This study contains two moderators. The first one is a continuous variable named *Transport\_Convenience*. To measure the transport convenience of a hotel, we followed Yang et al. (2018) to use the distance from the hotel to the nearest metro station.

To avoid multicollinearity, we centralized the metro distance. The second one is a dummy variable representing whether the reviewer is a business traveler, denoted as *Business\_Traveler*.

According to the Elaboration Likelihood Model, customers use the central route and the peripheral route to process the post-purchase information. Thus, we controlled the quality of a hotel using four hotel aspect ratings: *Location*, *Facility*, *Service*, and *Cleanliness*. To avoid redundancy and multicollinearity, we followed Liu et al. (2020) to conduct Principal Component Analysis, which yielded a single quality factor score, denoted as *Quality*. Besides, we also controlled reviewers' personal characteristics, reviews' characteristics, and hotels' characteristics. Table 1 summarizes the Operationalization of variables.

Table 3: Correlation matrix of major variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Airport_Distance	1							
(2) Station_Distance	-0.097***	1						
(3) Trans_Amenity_Vairety	-0.028***	0.282***	1					
(4) Free_Trans_Amenity_Variety	-0.293***	0.367***	0.441***	1				
(5) Overall_Rating	0.000	0.027***	0.009***	0.031***	1			
(6) Business_Traveler	-0.073***	0.027***	0.053***	0.112***	-0.043***	1		
(7) Quality	-0.076***	0.018***	-0.130***	0.014***	0.172***	-0.062***	1	
(8) Transport_Convenience	-0.213***	0.186***	0.219***	0.464***	0.013***	0.069***	0.033***	1

Notes: 1. We report z-statistics in parentheses. 2. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 . 3. Due to page limits, we only report the correlation matrix of eight major variables.

### Empirical model

Consistent with the literature Liu et al. (2020), We use the ordered logistic regression model as the benchmark model. Equation (1) studies the impact of the variety of transport amenities on customer satisfaction. In equation (2), the traveler's profile is a moderator to explore whether business travelers prefer transport amenities to leisure travelers. In equation (3), we change the model from the ordered logistic regression model to the ordinary least squares (OLS) regression model in order to examine margins of basic relationship for specified values of transport convenience. Some arguments may arise from this model change; the explanation can be that the overall rating can be regarded as either continuous or discrete. Therefore, it is reasonable to use the OLS model.

$$Pr(Overall\_Rating_{ijt} = k) = Pr(\lambda_{k-1} < U_{ijt} \leq \lambda_k)$$

$$U_{ijt} = \beta_1 Trans\_Amenity\_Variety_j + \delta_1' \mathbf{X}_j + \delta_2' \mathbf{Y}_i + \delta_3' Travel\_Type_{it} + \theta_1' CityID_j + \theta_2' Time_t + \varepsilon_{ijt} \quad (1)$$

$$Pr(Overall\_Rating_{ijt} = k) = Pr(\lambda_{k-1} < U_{ijt} \leq \lambda_k)$$

$$U_{ijt} = \beta_1 Trans\_Amenity\_Variety_j + \beta_2 Trans\_Amenity\_Variety_j \times Business\_traveler_{it} + \beta_3 Business\_traveler_{it} + \delta_1' \mathbf{X}_j + \delta_2' \mathbf{Y}_i + \theta_1' CityID_j + \theta_2' Time_t + \varepsilon_{ijt} \quad (2)$$

$$\begin{aligned} Overall\_Rating_{ijt} = & \beta_1 Trans\_Amenity\_Variety_j \\ & + \beta_4 Trans\_Amenity\_Variety_j \times Service\_Competition_j \\ & + \beta_5 Service\_Competition_j \\ & + \delta_1' \mathbf{X}_j + \delta_2' \mathbf{Y}_i + \delta_3' Travel\_Type_{it} + \theta_1' CityID_j + \theta_2' Time_t + \varepsilon_{ijt} \end{aligned} \quad (3)$$

$\mathbf{Y}_i$  represents a vector of variables controlling various characteristics of reviewers and reviews, including *This\_Review\_Pic\_Total*, *User\_Avatar*, *System\_Name*, *Lnreview\_Length*, *Temporal\_Distance*, and *User\_Grade*.  $\mathbf{X}_j$  represents a vector of variables controlling various characteristics of hotels, including *Quality*, *Price\_Mean*, *Room\_Num*, *Monthly\_Neg\_Review\_Num*, *Monthly\_Pic\_Review\_Num*, and *Hotel\_Grade*. *Travel\_Type* is a category variable. We treat it as a vector of dummies, including *friends*, *business*, *family*, and *lover*. To avoid multicollinearity, we drop *friends* as a control group. When exploring the moderating effect of *Business\_Traveler*, we don't control other travel types in our model. Besides, we control the fixed effects of the city and the month of reviews by introducing two sets of dummy variables, *CityID* and *Time*.

## RESULT

### Descriptive Statistics and Correlations

Table 2 reports the descriptive statistics of the key variables. Table 2 suggests that there are significant variances in the variables. Table 3 shows the correlation matrix of major variables.

Table 4: Ordered logistic estimation results.

	Dependent variable: Overall_Rating	
	(1)	(2)
Trans_Amenity_Variety	0.023*** (7.15)	0.015*** (3.91)
Business_Traveler		-0.179*** (-8.56)
Trans_Amenity_Variety × Business_Traveler		0.026*** (4.44)
Quality	0.179*** (48.60)	0.180*** (48.81)
Price_Mean	0.000*** (4.40)	0.000*** (4.38)
Lnreview_Length	-0.315*** (-53.20)	-0.320*** (-54.12)
This_Review_Pic_Total	0.092*** (19.82)	0.092*** (19.70)
Temporal_Distance	-0.029*** (-6.73)	-0.029*** (-6.75)
User_Avatar	0.261*** (23.11)	0.273*** (24.27)
System_Name	-0.182*** (-15.42)	-0.183*** (-15.44)
Monthly_Neg_Review_Num	-0.010*** (-18.97)	-0.010*** (-18.90)
Monthly_Pic_Review_Num	0.006*** (22.09)	0.006*** (21.66)
Room_Num	-0.001*** (-13.10)	-0.001*** (-13.57)
Lnhotel_Num	-0.022** (-2.53)	-0.021** (-2.35)
Hotel Grade	Yes	Yes
Travel Type	Yes	No
User Grade	Yes	Yes
Time Fixed Effects	Yes	Yes
City Fixed Effects	Yes	Yes
Observations	187,447	187,447

Notes: 1. We report z-statistics in parentheses. 2. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. 3. Due to page limits, some variables are not reported.

### Hypotheses Testing

Table 4 presents the order logistics estimation results about the effect of a variety of transport amenities on customer satisfaction and how *Business\_Traveler* affects the strength of this relationship. Following our expectation,  $\beta_1$  on the independent variable is significant and positive for all the models. The outcome indicates that customer satisfaction is higher when hotels offer more transport amenities. Thus, H1 is supported. In Table 4,  $\beta_2$  on the interaction term between *Trans\_Amenity\_Variety* and *Business\_traveler* is positive and significant, which means that as the variety of transport amenities becomes higher, business travelers will feel more satisfied than leisure travelers. Thus, H3 is supported. The result unveils business travelers' preference for convenience, which many prior researchers reported (Radojevic et al., 2018; Yang et al., 2018).

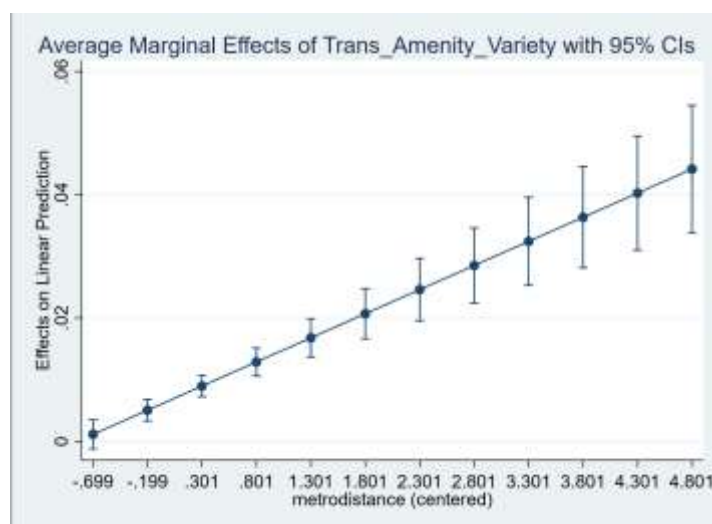


Table 5 presents the OLS results about the role of transport convenience of a hotel in moderating the relationship between the variety of transport amenities and customer satisfaction.  $\beta_4$  on the interaction term between *Trans\_Amenity\_Variety* and *Transport\_Convenience* is positive and significant. That means improving the variety of transport amenities can efficiently mitigate the weaknesses of hotels' transport convenience. To test our hypothesis, we draw the marginal effect of the variety of transport amenities and display it in Figure 1. At each cut point, the coefficient for the variety of transport amenities is positive and significant except for the first point. As the distance from the metro becomes farther, the effect becomes larger, which means hotels with poor locations can achieve better results by providing more transport amenities. Counter-intuitively, hotels with high transport convenience also need to provide more transport amenities.

Table 5: Ordinary least squares estimation results.

	Dependent variable: Overall_Rating (3)
Trans_Amenity_Variety	0.024*** (6.62)
Transport_Convenience	-0.065*** (-2.72)
Trans_Amenity_Variety×Transport_Convenience	0.024*** (4.59)
Other Controls	Yes
Hotel Grade	Yes
Travel Type	Yes
User Grade	Yes
Time Fixed Effects	Yes
City Fixed Effects	Yes
Observations	187,447

Notes: 1. We report z-statistics in parentheses. 2. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. 3. Due to page limits, the estimates of some variables are not reported.



Source: This study.

Figure 1: Marginal effects of the variety of transport amenities

Table 6 presents the result for the robustness test of the primary model. We use two replacement models to check out the reliability of the outcome, two-stage least squares regression(2SLS) and Multilevel mixed-effects ordered logistic regression(Meologit). We use the Meologit model to control the fixed effect of hotels to adjust the potential bias brought by the primary model. In addition, we propose two efficient instrumental variables: the distance from the hotel to the airport and the distance from the hotel to the high-speed railway station. Prior researchers have found that distance to public transportation is a significant determinant of location satisfaction and, to a certain extent, affects the online rating (Yang et al., 2018). However, we use the test of overidentifying restrictions in Stata to check the exogeneity of the instruments. The result cannot reject the

original hypothesis that the instrumental variables are effective ( $p\text{-value} > 10\%$ ). Further, our rank-sum tests corroborate the above arguments. The result shows no significant difference in customer satisfaction between hotels close to the airport ( $\text{Prob} > |z| = 0.2741$ ) or railway station ( $\text{Prob} > |z| = 0.6224$ ) and other hotels. This result finely confirms the validity of instrumental variables. The coefficients of the research variable in Table 6 are all positive and significant, Thus, confirm our findings above.

Table 6: Robustness check of the baseline model.

	Dependent variable: Overall_Rating		
	(1) ologit	robustness check	
		2sls	meologit
Trans_Amenity_Variety	0.023*** (7.15)	0.020*** (6.14)	0.026** (2.13)
Other Controls	Yes	Yes	Yes
Hotel Grade	Yes	Yes	Yes
Travel Type	Yes	Yes	Yes
User Grade	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes
Observations	187,447	187,447	187,447
R-squared		0.053	
Number of groups			201

Notes: 1. We report z-statistics in parentheses. 2. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . 3. Due to page limits, the estimates of some variables are not reported.

### ADDITIONAL ANALYSIS

#### Zero-price Effect

Shampanier, Mazar, and Ariely (2007) defined the zero-price effect. The zero-price effect means that a free product is attractive enough for users to give up another preferred alternative product because zero price conveys the idea of no cost and increases perceived value. The hotel provides complimentary amenities so that customers can enjoy differentiated services while avoiding external expenses. Some complimentary amenities have proven to improve the perceived value (Nicolau & Sellers, 2012; Palmeira, 2011; Papiés, Eggers, & Wlömert, 2011). Perceived value is also recognized as an essential factor to impact customer satisfaction (El-Adly, 2019; Hu, Kandampully, & Juwaheer, 2009; Kuo, Wu, & Deng, 2009). Therefore, we posited that complimentary transport amenities occupy a dominant position in promoting satisfaction. We use Dominance Analysis to compare the contribution of free transport amenities and non-free transport amenities to customer satisfaction. The result in Table 7 shows that the variety of free transport amenities completely dominates the variety of non-free transport amenities.

Table 7: General dominance statistics: ordered logistic regression.

Number of obs=187447 Overall Fit		
Statistic=0.0320		
All Subsets Fit Statistic=0.0317		
Overall_rating Dominance statistic Ranking		
Charge_Trans_Variety_Amenity	0.0001	2
Free_Trans_Variety_Amenity	0.0003	1

#### Asymmetric Relationship: the Adoption of the Three-factor Theory

The three-factor theory reveals an asymmetric relationship between hotel attributes and customer satisfaction. It divides hotel attributes into three categories: basic factors, performance factors, excitement factors. Basic factors mean that the lack of them will cause customer dissatisfaction, but their presence will not bring customer satisfaction. Performance factors mean that the lack of them will cause customer dissatisfaction, and the provision will bring customer satisfaction. Excitement factors mean that the lack of them will not depress customers, and the provision will get customers satisfied. We adopt the penalty-reward contrast analysis (PRCA) in this study to explore which category the transport amenity should belong to. The model is as

follows: We create a dummy variable, *Trans\_Variety\_Low*, to recode the hotel without any transport amenities. Then, we create another dummy variable, *Trans\_Variety\_High*, to recode the hotel that provides all transport amenities. We use the order logistics regression and the same set of covariates as the previous model in this additional analysis. Column (1) in Table 8 indicates that, in general, the transport amenity is a performance factor. To explore the effect of travelers' profiles on this asymmetric relationship, we use grouped regression model. Column (2)-(3) in Table 8 report that the transport amenity is an excitement factor for leisure travelers and a basic factor for business travelers.

Table 8: Applying three-factor theory to define the transport amenity.

	(4)	Grouped regression	
		Leisure travelers	Business travelers
Trans_Variety_Low	-0.135*** (-5.70)	-0.111*** (-3.97)	-0.214*** (-4.64)
Trans_Variety_High	0.125** (2.10)	0.142** (2.00)	0.145 (1.15)
Other Controls	Yes	Yes	Yes
Hotel Grade	Yes	Yes	Yes
Travel Type	Yes	Yes	No
User Grade	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
City Fixed Effects	Yes	Yes	Yes
Observations	187,447	117,887	69,560

Notes: 1. We report z-statistics in parentheses. 2. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. 3. Due to page limits, the estimates of some variables are not reported.

## DISCUSSIONS, IMPLICATIONS, AND LIMITATIONS

### Discussion of Findings

The present research seeks to advance our understanding of strategies to improve the convenience of a hotel by proposing and testing a model that explores the impact of transport amenities on customer satisfaction. We focus on customers' peripheral route to process the post-purchase experience based on the elaboration likelihood model. Quantity is widely regarded as a peripheral cue to process information. In this study, we choose a variety of transport amenities as a peripheral route to evaluate the hotel's performance. We validate the proposed models by using a dataset assembled from a famous online travel community. The empirical results of this study lead to some interesting findings that previous studies have not revealed.

First, the findings show that the variety of transport amenities has a positive impact on customer satisfaction. The results also indicate that the effect exists in both hotels with low and high transport convenience. The findings thus underscore that, besides the central route, such as service quality, customers will also use the peripheral route to evaluate the experience. As expected, compared with leisure travelers, business travelers emphasize the variety of transport amenities in a hotel and put more weight on them when rating. As we stated above, business travelers prefer more convenient hotels. Another potential explanation is that business travelers usually use a peripheral route to process information because of busy schedules.

In addition, we do some additional analysis. The results indicate that complimentary transport amenities dominate the contribution to customer satisfaction. The potential explanation is that complimentary services make customers more tolerant when evaluating the experience. We also adopt the three-factor theory to define transport amenities. We illustrate that the transport amenity is a basic factor for business travelers and an excitement factor for leisure travelers.

### Theoretical Implications

The current research makes critical theoretical contributions to the existing elaboration likelihood model literature. First, to our knowledge, this is the first study to focus exclusively on post-purchase information processing in the hospitality industry based on ELM. Though regarding service quality as an antecedent of customer satisfaction has reached a consensus, some peripheral cues such as variety have not been investigated. We advance the knowledge base by focusing on transport services to explore how the variety of transport amenities, a peripheral cue, affect customer satisfaction. This study provides valuable knowledge for our understanding of post-purchase information processing. Although some bias may exist in measuring some variables, this provides some ideas for researchers and practitioners. That is, not only what customers have experienced but also what they have seen determines their satisfaction.

Secondly, we enhance the existing hotel location literature. The existing hotel location research focuses primarily on identifying fixed location factors associated with higher occupancy rates and customer satisfaction. Few studies thus far have examined the flexible factors relating to alleviating hotel location disadvantages. As such, the present research seeks to advance our understanding of strategies to improve the convenience of a hotel by exploring the efficient leverage of the

transport amenity. The empirical results show comprehensive guidance for hoteliers about when and how to use transport amenities and the target of transport amenity.

### Managerial Implications

Our research may eventually help hoteliers recognize that perceived variety will significantly positively impact service evaluation. In order to strengthen customers' perceived variety, hotels can mount some guide signs in the hotel lobby or elevators. This study also helps hoteliers address the practical needs of a hotel manager to balance cost and benefit for arranging services. Our results empirically suggest that hoteliers can selectively offer transport amenities according to hotels' themes. For hotels that mainly serve business travelers, offering various transport amenities seems a necessary expense. However, for hotels that mainly serve leisure travelers, it can depend on the situation. Besides, according to the zero-price effect, hotels can select some amenities to offer free of charge regularly.

### Limitations and Future Research

Several limitations of the study warrant careful consideration. First, we only used the number of transport amenities shown on the hotel reservation page to measure the variety of transport amenities which may bring some potential bias. Future research could overcome this issue by mining from customers' online review text to measure perceived quality and variety more precisely. Second, our research focuses on observed customer satisfaction and the variety, thus limiting our ability to investigate the psychological processes underlying the behavior, which may weaken the theoretical contributions of this study. As such, further questionnaire research or laboratory studies are required to provide additional insight into the underpinning mechanism of our findings. Moreover, the data used in this research was collected from a Chinese online travel community. The majority of its visitors are Chinese. Considering that some cognition differences can be found among different national cultures, future research can conduct similar studies in the international online travel community such as TripAdvisor or Yelp.

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