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The Effects of O2O Service Factors on Sequel Service Adoption: O2O Service Quality Dimensions and Perceived Fit¹

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Abstract

As the mobile-based O2O industry grows, many existing O2O service providers are attempting to expand their businesses by service diversification. According to this trend, the current study investigated the effects of the parent O2O service-related factors on the user adoption of a sequel service. Specifically, a total of ten dimensions encompassing the whole service delivery process that flows from a convenient mobile app to an offline area were identified. Another factor that this study considered is users' fit perception between the parent and the sequel O2O service. To empirically test the conceptual model, this study carried out analyses for two different types of service: a food delivery (Case 1) and taxi-hailing O2O service (Case 2). The findings were drawn from a total of 444 South Korean respondents who have experience with using the parent O2O services but not with the sequel services. Results found that, for Case 1, informativeness and security of online service quality, and reliability and empathy of offline service quality were significant antecedents of satisfaction with the O2O service. For Case 2, efficiency of online service quality, ubiquity of O2O-specific service quality, and empathy were found to significantly affect O2O satisfaction. Results of both cases showed that perceived fit was a significant antecedent of intention to use a sequel service when attitude toward a service extension mediated. O2O satisfaction was found to be a crucial element influencing both O2O loyalty and intention to use a sequel service.

Keywords

O2O service, Perceived service quality, Perceived fit, Loyalty, Intention to use

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1.Introduction

With advancement in mobile communication technology, users are no longer bound to a certain location or a specific device to stay connected. Wireless mobile Internet enabled users to access plenty of Internet-based services through their mobile devices at anytime and anywhere. One of the most widely used types of mobile business is the online-to-offline (O2O) service. O2O is an e-commerce model that combines offline business opportunities with the Internet to pull the offline transaction online.

Of the business models of O2O commerce, the current study focuses on ‘aggregator’ model, where O2O is defined as a form of service that matches suppliers to consumers through an online platform or mobile application (Agrawal, 2016). In this model, O2O service providers collect commissions from either offline vendors/small local contractors or charge the users for each matching. Otherwise, they earn profits by selling advertisements on their platforms. O2O commerce covers a wide range of businesses including not only transportation, lodging, real estate and food delivery but also laundry, housekeeping assistance, car rental, etc. The O2O service market is anticipated to grow at a high growth rate globally even if the estimated number differs by institution.

Compared to other types of business, entry barrier is low for the O2O service market since heavy investment in physical infrastructure is not required. For this reason, there is a fierce competition in the market, which results in the enormous marketing expenditure. Recently, some of the O2O service providers are gradually seeing profits after years of losses as they are winning out over their rivals. Subsequently, along with the efforts to solidify their position as a market leader, these successful operators are attempting to diversify into new businesses to further improve profits in the long term and to establish the next revenue growth driver. Some O2O service providers with strong funding powers diversify into new businesses even before they become profitable, seeking to preempt the potentially lucrative markets.

Despite the trend, there is limited research in academia dealing with business diversification of O2O service providers. Though a recent study showed that the satisfaction with a mobile instant messaging (mIM) service affects the loyalty on O2O services that are operated by the same mIM service provider, mediated by the satisfaction with O2O services (Hwang & Kim, 2018), few studies addressed its relations with O2O service quality factors.

On the other hand, when a sequel service is launched, it tries to capitalize on the parent (core) O2O service's established user base. How many existing users would flow into the sequel service should be one of the biggest concerns for the operator. As many of prior studies have indicated, the impact that a parent brand has on the use of its sequel extension is significant. In the context of O2O service extension, it is assumed that positive O2O service quality perception strengthens the intention to use the new service.

In terms of the dimensions of the O2O service quality, users' assessment with an O2O service may be based on the combination of online and offline experience, as reservations/purchases are made online via mobile Internet and the actual product/service is delivered offline. However, there is limited research on the O2O service that examined these facets altogether. Although Zhang (2014) suggested a model for the loyalty on O2O services that encompasses both online and offline constructs, and Moon (2016) explored the service quality attributes for an O2O service in terms of both online and offline service experience, neither of these studies was empirically tested.

Therefore, to fill this gap, the current study aims to build and empirically test a model pertaining to the impact of a parent O2O service on intention to use its sequel service. The uniqueness of this study is that, first, we suggest roughly two routes in examining the impact of a parent O2O service on the use of a newly launched service under the same brand: (1) the causal chain of O2O service quality – satisfaction – loyalty for the parent O2O service and (2) the perceptual linkage between parent and sequel services, namely the perceived fit. Second, this study attempts to examine the offline and mobile-O2O-specific service quality dimensions that influence overall perception of the service along with online service quality dimensions. Users may think they are receiving the service under the name of the O2O brand even though O2O services essentially do a role as a middleman that matches good/service providers with users. Users may not be able to discretize the service delivery process seamlessly flowing from an online to an offline area and thus consider the O2O service is responsible for the comprehensive quality management encompassing the entire process. Lastly, this study conducted analysis on two different services respectively so that it can offer a broad and comprehensive understanding of the current topic of research.

To conclude, by focusing on the impact of the parent O2O service on the sequel service's user acquisition, this study aims to provide timely and meaningful contributions in both academia and related industries.

2. Literature Review

2.1. Overview of the O2O Industry

O2O is defined as a form of service that matches suppliers to consumers through an online platform or mobile application (Agrawal, 2016). It was coined by Alex Rampell, the CEO and founder of TrialPay, in a 2010's TechCrunch article. Although the term O2O originated in the U.S., it has been mainly used in Asia, including China and Korea where the O2O businesses are thriving. O2O is also often referred to as 'on-demand economy' in the U.S. and European regions.

As O2O businesses grow worldwide thanks to the ever-increasing smartphone penetration, the market-dominating operators are eager to expand their business by launching new services with the aims to improve profits, establish the next revenue growth driver and preempt potentially lucrative markets. For instance, Airbnb recently launched a higher-end accommodation booking service called Airbnb Plus to accommodate the needs of those who are willing to pay for quality trip experience. Similarly, Uber has made several tiers of ride-hailing service such as Uber X, Uber Black and Uber SUV. Moreover, it has got into food delivery business called UberEATS by leveraging its existing driver's network worldwide.

In Korea, some major IT enterprises such as Kakao, the nation's dominant mIM service provider named Kakaotalk, is operating their own O2O services. Leveraging the large domestic user base, Kakao has been zealous in transforming from a chat app to an integrated digital platform delivering various value-added services. Its service portfolio includes KakaoT, an integrative mobility service that offers taxi-booking, chauffeur-hailing and parking space sharing services, and Kakao Hairshop, a hair salon booking service.

Other than the local IT giants, there are a good number of startups that have jumped into the O2O industry in Korea. Currently, of the Korean first-generation O2O startups, Woowa Brothers, the operator of Baedal-ui-Minjok (Baemin, hereafter) is the most active in business diversification. As the leading food delivery aggregator app in Korea, it has launched couples

of sequel services including BaeminChan, a home meal replacement (HMR) delivery service and Baemin Riders, a food delivery service from up-scale restaurants. By expanding its business into adjacent domains, it seeks to become an integrative ‘food-tech’ enterprise.

2.2. Perceived Service Quality – Satisfaction – Loyalty

Loyalty is the core goal of relationship marketing and thus has been one of the main research topics in business academia. It is defined as “a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future [...] despite situational influences and marketing efforts having the potential to cause switching behavior” (Oliver, 1999, p.34). In early studies on loyalty, the focus of research was inclined to tangible goods (Caruana, 2002). Recently, with growing attention to customers’ loyalty to intangible online services, loyalty theory has been applied to ICT industry: e-commerce (e.g., Gommans, Krishnan, & Scheffold, 2001), e-banking (e.g., Chu, Lee, & Chao, 2012) and mobile instant message service (e.g., Deng, Lu, Wei, & Zhang, 2010).

Abundant marketing literature have examined the antecedents of loyalty (Hennig-Thurau, Gwinner, & Gremler, 2002). Above all, satisfaction is one of the most commonly and repeatedly confirmed univariate antecedents of loyalty. According to an integrative definition, satisfaction is an “overall customer attitude towards a service provider or an emotional reaction to the difference between what customers anticipate and what they receive, regarding the fulfillment of some need, goal or desire” (Hansemark & Albinsson, 2004, p.41). Its relational outcome has been proven in a number of multivariate models explaining loyalty (Deng et al., 2010; Hallowell, 1996; Hennig-Thurau et al., 2002; Oliver, 1999; Yang & Peterson, 2004).

Service quality is defined as the extent to which a service meets consumers’ needs or expectations (Lewis & Mitchell, 1990; Wisniewski & Donnelly, 1996). Parasuraman, Zeithaml and Berry (1985) noted that customers would perceive that the quality of service is high if it surpasses their expectation on its performance. If the perception of the service performance falls short of the expectation, customers would consider that the service quality is low. Although practitioners often use the two terms service quality and customer satisfaction interchangeably, a number of studies made a distinction that satisfaction is a post-decision customer experience whereas service quality is not (Caruana, 2002). That is, as a process in time, service quality perceptions, which takes place before, lead to overall customer satisfaction (Caruana, Money, & Berthon, 2000; Sureshchandar, Rajendran, & Anantharaman, 2002).

The notions of service quality, customer satisfaction and service loyalty are associated with each other, where the expectancy/disconfirmation paradigm provides the theoretical grounding. In Caruana (2002)'s study, service quality was found to be an antecedent construct that acts on service loyalty via satisfaction. For the context of this study, it is anticipated that each service quality attribute may positively affect satisfaction with the O2O service itself and accumulated positive assessment of the service may increase the loyalty to the service. Therefore, the hypotheses projecting relationships between the service quality attributes – satisfaction – loyalty for an O2O service are proposed as follows (hypotheses specifying the relationships between each of the O2O service quality attributes and satisfaction with the service are stated in the next section):

H1: Satisfaction with an O2O service is positively associated with loyalty to the service.

2.3. O2O Service Quality Attributes

In light of how O2O services are delivered from online to offline via a mobile platform, this study attempted to identify the dimensions of O2O service quality. To that end, along with the O2O-related extant studies, as they are recent and limited in number, prior literature in the domain of marketing, web site quality, mobile service and food management were examined altogether.

This study divides the service quality attributes of an O2O service into three parts: 1) online service quality that mobile O2O platform operators manage, 2) the O2O-specific quality that is unique to a mobile app-based O2O service, 3) offline service quality which individual contractors have control over. Specifically, this study considers *informativeness*, *security*, *efficiency* and *e-scape* as online service quality attributes, *interactivity* and *ubiquity* as O2O-specific service quality attributes, and *tangibles*, *reliability*, *responsiveness*, *assurance* and *empathy* as offline service quality attributes.

2.3.1. Online Service Quality

Informativeness refers to the service's capability to inform customers about various alternatives, and to provide timely and useful information. It has been recognized as an important service quality attribute determining the perception of web site quality (Chu, Chen, Lin, & Wu, 2008; Liu & Arnett, 2000; Zeithaml, Parasuraman, & Malhotra, 2002). The rich, up-to-date and useful information helps users compare products/services and make an informed

purchase decision (Lin, 2007). The core function of the O2O service is to offer information on products/services of offline proprietors. O2O services with high level of informativeness is anticipated to contribute to users' satisfaction. Therefore, the hypothesis is stated as follows:

H2: The informativeness of O2O is positively associated with O2O service satisfaction.

Security in e-service literature refers to users' confidence in the safety of the service from intrusion of privacy and in the protection of personal information. Users tend to have more concern with transaction's safety while making a purchase online, due to the lack of a physical entity and interpersonal contact (Ho & Lee, 2007). For this reason, security is considered as a critical element in terms of service quality and satisfaction (Szymanski & Hise, 2000; Yoo & Donthu, 2001). Most O2O services have an in-app payment system and collect private user information such as financial information and location in order to provide users with time-efficient and hassle-free experience. This, however, may adversely raise privacy concerns that make them waver in using the service. Therefore, services with high level of security are assumed to positively affect satisfaction, and we expect that:

H3: The security of O2O is positively associated with O2O service satisfaction.

Efficiency has been regarded as one of the most crucial dimensions that affect the perceived value and loyalty (Parasuraman, Zeithaml, & Malhotra, 2005). The study of Hwang and Kim (2018) also confirmed that efficiency is the most robust predictor of satisfaction, which then leads to loyalty factors. In an online context, efficiency is related to how easy they can use a service and how efficiently it helps them with completing her/his tasks (Zeithaml et al., 2002). Efficiency in the context of O2O service means the service's capability to economically save one's time and effort. The O2O service is by its nature an end-to-end solution eliminating many middle layers by directly matching demands with supplies online. Plus, with the simplicity of reservation and payment procedure, it is easily operable with a few tap on the mobile device. Therefore, we expect that:

H4: The efficiency of O2O is positively associated with O2O service satisfaction.

E-scape, or electronic servicescape, relates to the usability of an online service. It refers to the perceived attractiveness of design and intuitive on-page navigation. In an online context, graphics and interface designs are a pervasive and powerful force influencing users' perception

of quality, since these visual elements – color, size, typography, layout and overall presentation – are directly linked to user experience (Harris & Goode, 2010). Previous studies highlighted that the functionality and usability of a web site and an app are the important standards in users' assessment of the service (Chu et al., 2008; Harris & Goode, 2010; Lu, Zhang, & Wang, 2009). In general, O2O services have to display lots of information on a small app screen. Users may get even more frustrated when the O2O user interface is complicated. A well-organized, highly readable and visually appealing interface will contribute to customer satisfaction, hence.

H5: The e-scape of O2O is positively associated with O2O service satisfaction.

2.3.2. O2O-specific Service Quality

Interactivity refers to a quality of electronically mediated communications characterized by increased control over the communication process by both the sender and receiver (Neuman & Neuman, 1991). It reflects the availability of interaction with a service provider during the service delivery. Due to the intangibility of service, much research has shown that interaction quality has the most significant effect on service quality (Bitner, Booms, & Mohr, 1994; Grönroos, 1984; Hartline & Ferrell, 1996). Mobile Internet and mobile devices made it easier for O2O service users to interact with the service providers, by creating a more responsive and controllable communication opportunity. Users can easily contact the offline service provider by using in-app chat function or making a call. In addition, they can conveniently leave reviews and give ratings about the service they've received. The offline service providers can also leave a comment on customer inquiries or complaints, which facilitates the customer relationship management. These benefits of an O2O service are assumed to positively affect users' satisfaction with the service. Hence.

H6: The interactivity of O2O is positively associated with O2O service satisfaction.

Ubiquity is the ability to obtain information and conduct mobile transactions any place via Internet-enabled mobile devices (Kim & Hwang, 2012). The 'omnipresence' characteristics of mobile Internet allow users to receive desired services at any time and anywhere (Anckar & D'Incau, 2002). That is, the omnipresence of mobile-Internet-based O2O services enables users to access and receive the service without any time or place restrictions. Prior research indicated that the mobile service that can be reachable at any time from anywhere heightens the

experiential value perception of the service and lead to satisfaction (Tojib & Tsarenko, 2012). Based on the previous finding, this study proposed the following hypothesis.

H7: The ubiquity of O2O is positively associated with O2O service satisfaction.

2.3.3. Offline Service Quality

As for the offline service quality, it was the study of Parasuraman et al. (1985) that suggested ten dimensions of service quality, which are tangibles, reliability, responsiveness, communication, access, competence, courtesy, credibility, security, understanding/knowledge of customers. Later these ten dimensions were integrated into five specific components and named as SERVQUAL: tangibles, reliability, responsiveness, assurance and empathy (Parasuraman, Zeithaml, & Berry, 1988).

Tangibles refer to the physical evidence of the service. It includes physical facilities, appearance of personnel, or equipment used to provide the service. *Reliability* is defined as the ability to deliver the service reliably and correctly, as promised. *Responsiveness* refers to the willingness or readiness of service providers to deliver a service (e.g. timeliness of service), while *assurance* concerns the knowledge and courtesy of employees and their ability to inspire trust. Lastly, *empathy* corresponds to caring, individualized attention that a service provider offers to its customers.

SERVQUAL is said to be applicable in an extensive spectrum of service domains including financial institutions, libraries and hotels, although some of its components have been rephrased or more components have been added to it. There are few studies that examined the offline service quality attributes of an O2O service. Therefore, as an explorative empirical research that attempts to identify O2O service quality dimension, this study used the SERVQUAL dimensions to test the effects of service quality factors derived from the offline sector on the overall satisfaction with the O2O service. Hence, hypotheses were stated as follows:

H8: Tangibles of O2O is positively associated with O2O service satisfaction.

H9: The reliability of O2O is positively associated with O2O service satisfaction.

H10: The responsiveness of O2O is positively associated with O2O service satisfaction.

H11: The assurance of O2O is positively associated with O2O service satisfaction.

H12: The empathy of O2O is positively associated with O2O service satisfaction.

2.4. Perceived Fit – Attitude toward Extension – Intention to Use Sequel Services

To understand the perceptual connection of the parent O2O and sequel service, factors from the brand extension literature were examined. Of the related factors, perceived fit has been identified as the most important driver of the extension's success (Keller & Aaker, 1992; Völckner & Sattler, 2006). Perceived fit, which refers to a function of both product feature similarity and brand concept consistency perceptions (Park, Milberg, & Lawson, 1991), finds its conceptual base in categorization theories of cognitive psychology (Bhat & Lenny, 2001; Broniarczyk & Alba, 1994). According to the theories, the evaluation of a proposed extension depends on one's classification and assessment of the new product/service based on her/his cognitive categories, in that categorical coherence with the parent brand in consumers' minds ensue the affect transfer. Therefore, a high level of perceived fit is believed to transfer positive attitude toward the parent brand to the extension (Czellar, 2003; Park et al., 1991).

On the other hand, the link between attitude and behavioral intention is one of the enduring findings in the field. The causal connections of belief, attitude, intention and actual behavior from the theory of reasoned action (TRA) provide the theoretical groundings for the proposed relationship between attitude toward and usage intention of the sequel service.

Although there are not many, studies have been conducted in the context of Internet media firms' brand extension/diversification. For example, Chang and Chan-Olmsted's (2010) study on users' perceptions toward cable network extensions imply that fit between parent and extended channels lead to a positive attitude toward the network extension. The study of Song, Zhang, Xu, and Huang (2010) also shows that perceived fit between a news portal (parent service) and the virtual community (sequel service) is related to the use of the virtual community service when the service quality mediates. When applied to the context of this study, the perceived fit between the proposed parent and the sequel O2O service may have a positive association with attitude toward the extension, which in turn leads to usage intention of the sequel service.

H13: Perceived fit is positively associated with attitude toward an extension.

H14: Attitude toward an extension is positively associated with intention to use a sequel service.

2.5. Impact of Evaluation on Parent O2O on Intention to use Sequel Services

In the previous section, perceived fit was assumed to affect intention to use the sequel service. Along with that, this study also examined the impacts of satisfaction and loyalty as the outcome constructs of overall service quality evaluation on intention to use a sequel service.

Previous studies have shown that general affect on a certain object can be transferred from one to another (Bhat & Lenny, 2001). It implies that if consumers have affect toward a brand it is evoked when they encounter an extension, which Bhat and Lenny (2001) termed as the affect-based process of extension evaluation. Satisfaction, in this context, is a user's perceived quality evaluation and a positive association formed after using the service. In an online service context, Lee, Yeon and Park (2010) showed that satisfaction with a portal site (a parent brand) significantly affects intention to use the extended service when perceived usefulness is mediated. The study of Hwang and Kim (2018), which examined the impact of the user experience of a mobile instant messaging service (a parent brand) on satisfaction with and loyalty toward the O2O service extension empirically, proved that satisfaction with the mIM service affects satisfaction with the O2O service. Based on the previous findings, this study presumes that a user's satisfaction with the parent O2O service affects her/his attitudes toward newly launched O2O services, which in turn leads to usage intention.

Another route to the use of a sequel service pertains to loyalty to the parent O2O service. Loyalty toward a specific brand is considered important in that it guarantees the profitability and competitive advantage of a company. User loyalty is often anticipated to help service providers land softly into a new market (Hwang & Kim, 2018). According to Lassar, Mittal and Sharma (1995), consumers who display loyalty to a brand are willing to adopt the brand extensions. Similarly, Bhat and Reddy (2001) and Wu and Lo (2009) demonstrated the impact of parent brand attitude and perception (e.g., perceived fit) on purchase intention of an extended product. This study builds on these findings and examines the relationship between loyalty toward the parent O2O service and intention to use the sequel service. Hence.

H15: Satisfaction with O2O is positively associated with attitude toward an extension.

H16: Loyalty toward O2O is positively associated with intention to use a sequel service.

Based on the sixteen aforementioned hypotheses, *Figure 1* shows the research model of this study.

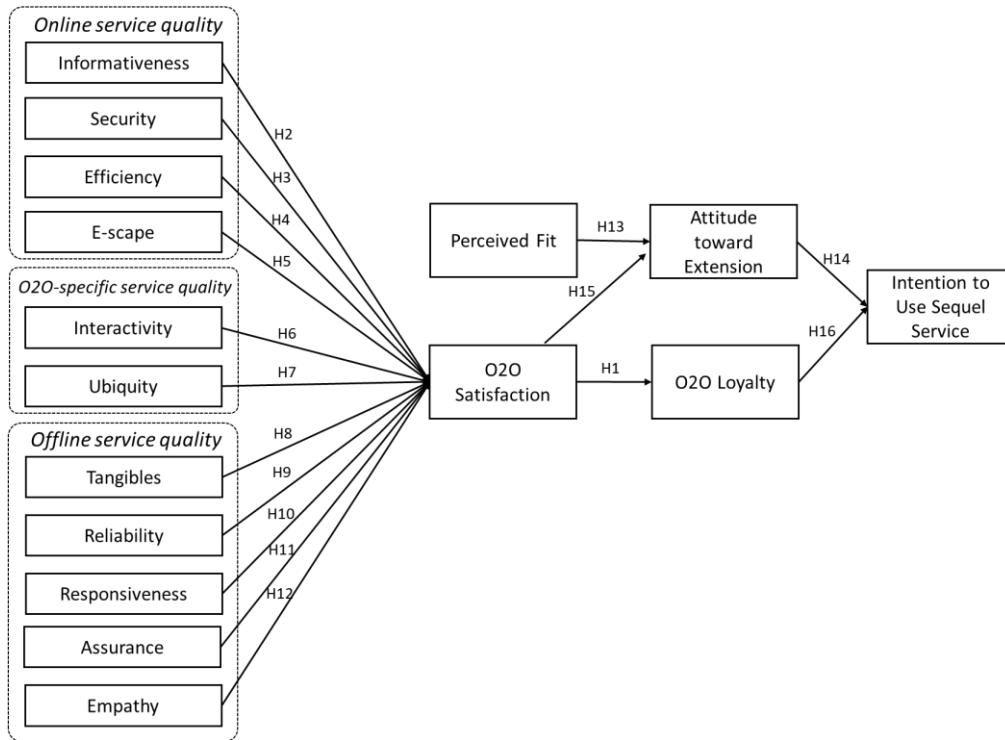


Figure 1. Research model

3. Methodology

3.1. Overview

This study employed a survey method as its quantitative approach. Under different industry sectors, the results of the research are expected to vary. Therefore, in order to provide a comprehensive understanding of the present topic of research, this study selected two different cases, and then collected and analyzed the data respectively. For the industrial domain of parent O2O services, this study chose a food delivery and a ride-hailing (taxi) business, which are currently two of the most active and vibrant fields of O2O business around the world including South Korea.

For Case 1, the leading Korean food delivery O2O service Baemin was chosen as a parent O2O service, and Baemin Riders was selected as a sequel service among its service portfolio. While Baemin mediates customers and food delivery restaurants, Baemin Riders provide delivery service with its own fleets and drivers from general restaurants that traditionally don't

deliver. For Case 2, this study chose Kakao T for a parent O2O service and Kakao Hairshop for its sequel service. Kakao T matches customers to nearby taxis available, and its sequel O2O service of Kakao Hairshop is a hair salon booking service where customers can find information and reviews on the hair salons and make a reservation. Baemin and Baemin Riders are affiliated with an independent operator, Woowa Brothers, whereas Kakao T and Kakao Hairshop are owned by Kakao, the messenger-based mobile platform operator.

3.2. Measures

To test the hypotheses, items from previous studies were adopted and modified to best fit in the context of this study. All items were measured by using a seven-point Likert scale ranging from “1=strongly disagree” to “7=strongly agree”. For the online service quality dimensions, 3 items of informativeness and 3 items of efficiency were borrowed from Chu et al. (2008). 2 items of security and 3 items of e-scape were from Wolfinbarger and Gilly (2003) and Van Riel, Lemmink, Streukens, and Liljander (2004), respectively. For the O2O-specific service quality dimensions, 3 items each were used to measure interactivity and ubiquity, and wordings from Liu (2003) and Tojib and Tsarenko (2012) were adopted. To measure the five dimensions of offline service quality, a total of 10 items based on the wordings of Dabholkar, Thorpe and Rentz (1996) were used.

For the rest, 5 items for perceived fit were adapted from Park et al. (1991) and Baht and Leddy (2001). 8 items of attitude toward an extension were from Batra and Stayman (1990). 3 items of O2O satisfaction and 5 items of O2O loyalty were derived from Kim, Jin and Swinney (2009) and Srinivasan, Anderson and Ponnnavolu (2002). For measuring O2O loyalty, both attitudinal and behavioral aspects (e.g., top-of-mind awareness, resistance to switch to alternatives, intention to recommend) were taken into account. Lastly, 3 items for measuring intention to use the sequel service was borrowed from Gefen (2000).

3.3. Data Collection and Analysis

The questionnaires were distributed from May 22 to June 6, 2018 through Macromill Embrain Co., a professional consumer research firm in South Korea. The questionnaires were sent by email to randomly selected online panels of the firm who are in their 20s through 50s. This study adopted the quota sampling technique where the assembled sample has the same proportions of individuals as the entire population in Korea in terms of gender and age. Due to

the topic of research, respondents were required to have experience with using the parent O2O service but not with its sequel service. Those who didn't meet the requirement were thus screened out before the survey. As a result, a total of 444 valid responses were retrieved and put into analysis, 223 of which were for Case 1 and the rest for Case 2. *Table 1* shows the descriptive statistics of the sample.

This study employed partial least square structural equation modeling (PLS-SEM) to test the hypotheses. The collected data were analyzed using the SPSS 18.0 and SmartPLS 3.0 software. PLS was considered an appropriate methodological tool for this study since PLS doesn't have a rigorous requirement for sample size and residual distribution (Phang, Sutanto, Kankanhalli, Li, Tan, & Teo, 2006) and thus is appropriate for exploratory analysis (Wold, 1985).

Table 1. Descriptive statistics

Variable	Item	Case 1	Case 2
		Frequency (%)	Frequency (%)
Gender	Male	113 (50.7)	114 (51.6)
	Female	110 (49.3)	107 (48.4)
	Total	223 (100)	221 (100)
Age	20-29	49 (22.0)	46 (20.8)
	30-39	47 (21.1)	47 (21.3)
	40-49	60 (26.9)	67 (30.3)
	50-59	67 (30.0)	61 (27.6)
	Total	223 (100)	221 (100)
Education	Graduate level	25 (11.2)	23 (10.4)
	University	165 (74.0)	171 (77.4)
	High school	32 (14.3)	27 (12.2)
	Other	1 (0.4)	0 (0)
	Total	223 (100)	221 (100)
Monthly House Income (KRW million)	Less than 1	6 (2.7)	2 (0.9)
	1-3	33 (14.8)	46 (20.8)
	3-5	89 (39.9)	78 (35.3)
	5-7	67 (30.0)	44 (19.9)
	7-9	18 (8.1)	34 (15.4)
	9 or more	10 (4.5)	17 (7.7)
	Total	223 (100)	221 (100)
Parent O2O service usage by frequency	7 times a week or more	1 (0.4)	2 (0.9)
	5-6 times a week	3 (1.3)	5 (2.3)
	3-4 times a week	4 (1.8)	7 (3.2)
	1-2 times a week	39 (17.5)	39 (17.6)
	1-2 times in two weeks	33 (14.8)	21 (9.5)
	1-2 times a month	72 (32.3)	27 (12.2)
	Less than 1-2 times a month	71 (31.8)	120 (54.3)
	Total	223 (100)	221 (100)

3.4. Test of measurement model

The preliminary step of PLS-SEM analysis is to evaluate the measurement model. It is to determine how well the items load on the hypothetically defined constructs. The measurement is assessed with internal consistency, convergent validity, and discriminant validity. First, Cronbach's alpha and composite reliability (CR) were examined to check the internal consistency within the constructs.

As shown in *Table 2*, all constructs had higher values than 0.6 for Cronbach's alpha and CR, a reasonable threshold suggested by Hair, Black, Babin, Anderson and Tatham (2006). Second, convergent validity, which is the degree that each indicator shows greater correlation to its constructs than to indicators of other constructs, was examined using factor loading and average variance extracted (AVE). As seen in *Table 2*, each construct had values above the acceptable level of 0.6 for factor loading and CR, and 0.5 for AVE (Gefen, Straub, & Boudreau, 2000; Hair et al., 2006). Each factor loading was significant at 5% level of significance. Lastly, discriminant validity was proven by using Fornell-Larcker criterion. According to Fornell and Larcker (1981), discriminant validity is confirmed when the square root of each construct's AVE has greater value than correlations between the construct and other latent constructs. As shown in *Table 3*, all the constructs met the criterion.

Table 2. Results of internal consistency and convergent validity test

Construct	Item	Case 1				Case 2			
		Factor loading	CR	AVE	Cronbach's alpha	Factor loading	CR	AVE	Cronbach's alpha
INF	1	0.852				0.894			
	2	0.863	0.893	0.735	0.820	0.898	0.917	0.787	0.865
	3	0.857				0.870			
SEC	1	0.837				0.872			
	2	0.895	0.857	0.750	0.670	0.907	0.884	0.792	0.739
EFF	1	0.814				0.797			
	2	0.909	0.904	0.759	0.841	0.933	0.909	0.769	0.847
	3	0.887				0.896			
ESC	1	0.875				0.887			
	2	0.922	0.927	0.808	0.881	0.927	0.932	0.819	0.890
	3	0.900				0.901			
INT	1	0.839				0.863			
	2	0.723	0.859	0.671	0.756	0.851	0.903	0.756	0.839
	3	0.887				0.894			
UBI	1	0.885				0.929			
	2	0.925	0.938	0.833	0.900	0.933	0.953	0.870	0.926
	3	0.928				0.937			
TAN	1	0.922				0.953			
	2	0.911	0.913	0.841	0.808	0.953	0.952	0.908	0.898
REL	1	0.897	0.903	0.824	0.787	0.926	0.929	0.867	0.847

	2	0.918				0.937			
RES	1	0.924				0.948			
	2	0.921	0.920	0.851	0.825	0.953	0.949	0.903	0.893
ASS	1	0.935				0.933			
	2	0.920	0.925	0.860	0.838	0.944	0.937	0.881	0.865
EMP	1	0.947				0.966			
	2	0.946	0.945	0.895	0.884	0.967	0.966	0.934	0.930
SAT	1	0.929				0.929			
	2	0.933	0.945	0.852	0.907	0.949	0.957	0.880	0.932
	3	0.907				0.937			
LOY	1	0.792				0.842			
	2	0.880				0.910			
	3	0.633	0.910	0.673	0.865	0.831	0.946	0.778	0.928
	4	0.893				0.917			
	5	0.873				0.906			
FIT	1	0.773				0.826			
	2	0.806				0.842			
	3	0.824	0.908	0.664	0.875	0.871	0.922	0.702	0.893
	4	0.848				0.853			
	5	0.820				0.794			
ATT	1	0.816				0.873			
	2	0.772				0.836			
	3	0.920				0.921			
	4	0.897				0.933			
	5	0.881	0.959	0.744	0.949	0.906	0.972	0.813	0.967
	6	0.863				0.907			
	7	0.862				0.910			
	8	0.880				0.926			
USE	1	0.917				0.954			
	2	0.927	0.947	0.857	0.916	0.951	0.962	0.895	0.941
	3	0.933				0.933			

Note: INF=Informativeness, SEC=Security, EFF=Efficiency, ESC=E-scape, INT=Interactivity, UBI=Ubiquity, TAN=Tangibles, REL=Reliability, RES=Responsiveness, ASS=Assurance, EMP=Empathy, SAT=O2O Satisfaction, LOY=O2O Loyalty, FIT=Perceived Fit, ATT=Attitude toward an Extension, USE=Intention to use a sequel service

Table 3. Results of correlations and discriminant validity

	Case 1															
	INF	SEC	EFF	ESC	INT	UBI	TAN	REL	RES	ASS	EMP	SAT	LOY	FIT	ATT	USE
INF	0.858															
SEC	0.510	0.866														
EFF	0.640	0.494	0.871													
ESC	0.634	0.471	0.627	0.899												
INT	0.580	0.536	0.535	0.565	0.819											
UBI	0.565	0.456	0.637	0.516	0.545	0.913										
TAN	0.579	0.531	0.467	0.551	0.557	0.423	0.917									
REL	0.577	0.523	0.553	0.595	0.593	0.493	0.793	0.908								
RES	0.583	0.519	0.448	0.555	0.611	0.394	0.764	0.796	0.923							
ASS	0.514	0.486	0.428	0.540	0.513	0.391	0.715	0.744	0.814	0.928						
EMP	0.501	0.439	0.401	0.540	0.528	0.362	0.734	0.753	0.822	0.779	0.946					
SAT	0.675	0.586	0.607	0.636	0.620	0.555	0.720	0.769	0.736	0.673	0.703	0.923				
LOY	0.618	0.480	0.607	0.538	0.475	0.587	0.582	0.622	0.589	0.560	0.578	0.754	0.820			
FIT	0.479	0.376	0.467	0.445	0.450	0.457	0.441	0.439	0.431	0.420	0.444	0.449	0.491	0.815		
ATT	0.637	0.496	0.553	0.596	0.517	0.423	0.570	0.560	0.570	0.538	0.603	0.655	0.667	0.599	0.863	
USE	0.514	0.430	0.432	0.479	0.439	0.349	0.439	0.441	0.467	0.410	0.549	0.558	0.568	0.522	0.856	0.926

Case 2

	INF	SEC	EFF	ESC	INT	UBI	TAN	REL	RES	ASS	EMP	SAT	LOY	FIT	ATT	USE
INF	0.887															
SEC	0.666	0.890														
EFF	0.731	0.603	0.877													
ESC	0.713	0.656	0.674	0.905												
INT	0.686	0.564	0.604	0.584	0.870											
UBI	0.643	0.558	0.698	0.593	0.709	0.933										
TAN	0.607	0.586	0.464	0.482	0.647	0.524	0.953									
REL	0.638	0.595	0.564	0.547	0.665	0.644	0.754	0.931								
RES	0.632	0.563	0.517	0.538	0.707	0.615	0.795	0.807	0.950							
ASS	0.595	0.615	0.544	0.530	0.670	0.596	0.787	0.791	0.832	0.939						
EMP	0.540	0.543	0.418	0.486	0.619	0.520	0.794	0.725	0.824	0.823	0.967					
SAT	0.702	0.616	0.721	0.623	0.703	0.727	0.679	0.742	0.760	0.747	0.711	0.938				
LOY	0.669	0.573	0.688	0.592	0.682	0.747	0.594	0.666	0.633	0.644	0.540	0.837	0.882			
FIT	0.309	0.287	0.181	0.296	0.291	0.194	0.365	0.336	0.299	0.361	0.383	0.251	0.186	0.838		
ATT	0.372	0.363	0.245	0.288	0.305	0.217	0.368	0.343	0.314	0.382	0.409	0.312	0.213	0.673	0.902	
USE	0.272	0.269	0.116	0.216	0.192	0.150	0.235	0.215	0.230	0.243	0.290	0.205	0.083	0.539	0.837	0.946

Note: Square roots of AVE are indicated in bold. For discriminant validity, the values should be larger than the correlation elements in the same row and column.

4. Results

4.1. Results for Case 1

The hypothesis testing using PLS-SEM analysis shows that the research model of Case 1 could explain 73.2% of the variance in satisfaction with a parent O2O service, 56.8% of the variance in loyalty to a parent O2O service, 54.5% of the variance in attitude toward an extension and 73.2% of the variance in intention to use a sequel service. Eight of the sixteen hypotheses were found to be consistent with the data. *Figure 2* and *Table 4* summarize the hypothesis testing results, path coefficients and *t*-values.

This study first hypothesized that O2O satisfaction would positively affect O2O loyalty, and O2O satisfaction was proven to be a robust antecedent of O2O loyalty ($\beta=0.754$, $p<0.001$), as shown through various prior literature (H1 supported). While all O2O-specific service quality dimensions did not have significant effects on O2O satisfaction, a total of four dimensions from online and offline service quality were found statistically significant. Specifically, informativeness ($\beta=0.155$, $p<0.05$) and security ($\beta=0.103$, $p<0.05$) of the online service quality and reliability ($\beta=0.217$, $p<0.01$) and empathy ($\beta=0.160$, $p<0.05$) of the offline service quality were found to be the significant predictors of O2O satisfaction (H2, H3, H9 and H12 supported). On the other hand, results showed that perceived fit between the parent O2O and the sequel

service was significantly related to attitude toward an extension ($\beta=0.382, p<0.001$) which then significantly affected intention to use a sequel service ($\beta=0.858, p<0.001$) (H13 and H14 supported). This study also assumed a positive relationship between O2O satisfaction and attitude toward an extension. The results showed that satisfaction with a parent O2O service had a significant spillover effect on attitude toward an extension ($\beta=0.484, p<0.001$) (H15 supported). However, the relationship between O2O loyalty and intention to use a sequel service was not statistically significant.

4.2. Results for Case 2

The R-square statistics of the research model of Case 2 shows that it could explain 77.2% of the variance in satisfaction with a parent O2O service, 70.1% of the variance in loyalty to a parent O2O service, 47.7% of the variance in attitude toward an extension and 77.1% of the variance in intention to use a sequel service. Seven of the sixteen hypotheses were found to be consistent with the data. *Figure 2* and *Table 4* summarize the results.

As with Case 1, the effect of O2O satisfaction on O2O loyalty was shown to be significant with a path coefficient of 0.837 ($p<0.001$) (H1 supported). As for the O2O service quality, three out of ten dimensions were found to be significantly related to O2O satisfaction. Specifically, efficiency ($\beta=0.292, p<0.001$) of online service quality, ubiquity ($\beta=0.167, p<0.01$) of O2O-specific service quality, and empathy ($\beta=0.215, p<0.01$) of offline service quality were found significant in explaining O2O satisfaction (H4, H7 and H12 supported). In addition, results showed that both perceived fit ($\beta=0.636, p<0.001$) and O2O satisfaction ($\beta=0.156, p<0.05$) were significant predictors of attitude toward an extension (H13 and H15 supported). Lastly, as for intention to use a sequel service, the current study hypothesized on two routes to it. First, H14 which specifies the relationship between attitude toward an extension and usage intention for a sequel service was consistent with the data ($\beta=0.859, p<0.001$). On the other hand, as opposed to what was expected, O2O loyalty was found to have a significant negative effect on intention to use a sequel service ($\beta=-0.100, p<0.05$), and hence H16 was not consistent with the data.

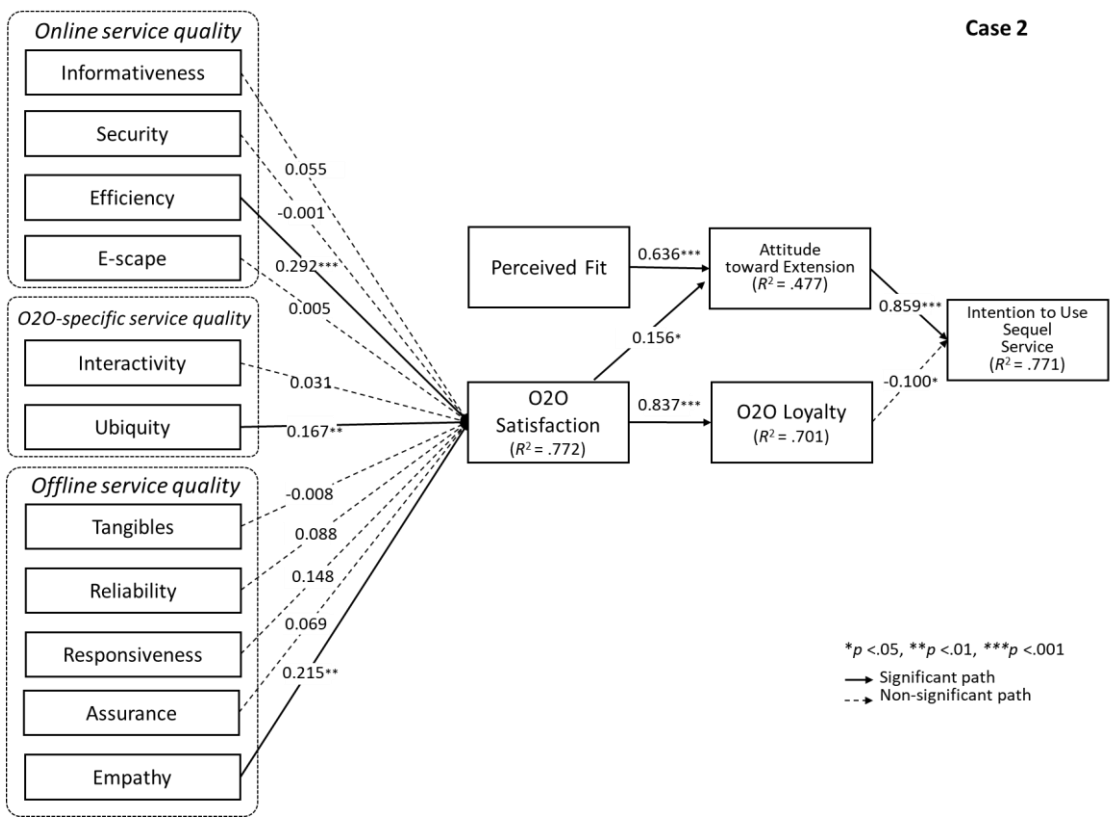
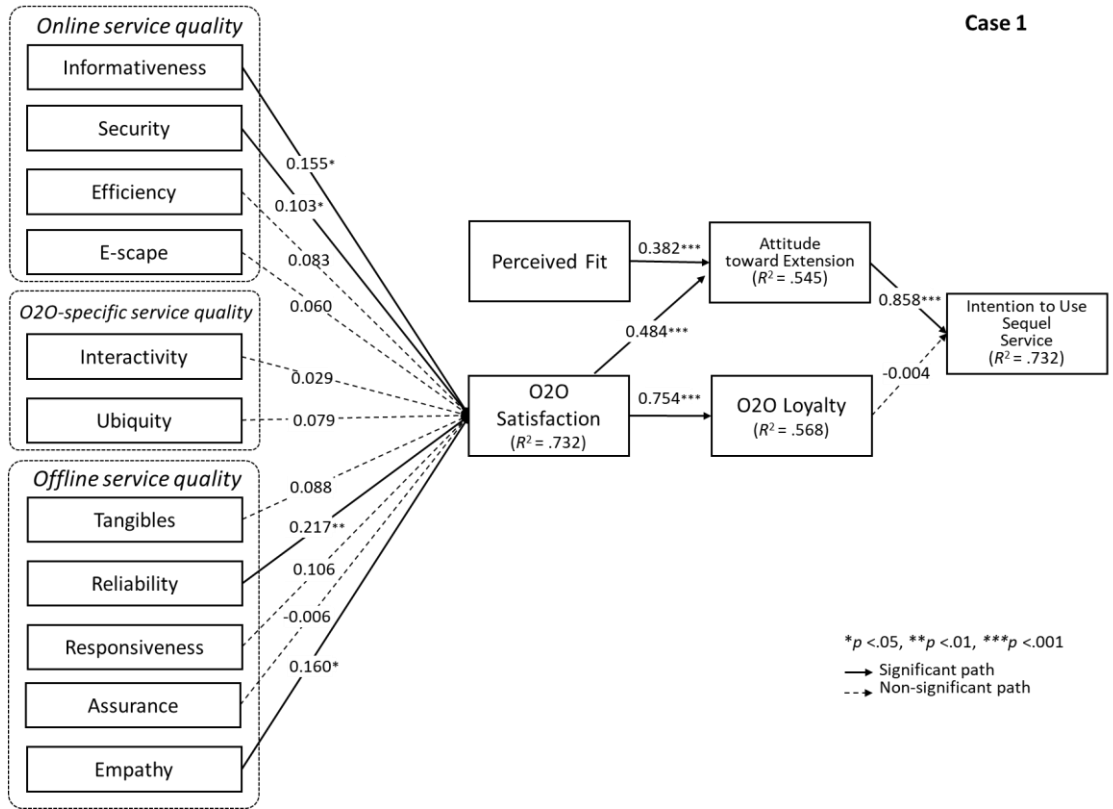


Figure 2. Research model and results

Table 4. PLS path estimates

		Case 1		Case 2	
		β	t	β	t
H1	O2Osatisfaction→O2OLoyalty	0.754	22.097***	0.837	35.306***
H2	Informativeness→O2Osatisfaction	0.155	2.509*	0.055	0.939
H3	Security→O2Osatisfaction	0.103	1.990*	-0.001	0.010
H4	Efficiency→O2Osatisfaction	0.083	1.206	0.292	3.944***
H5	E-scape→O2Osatisfaction	0.060	0.887	0.005	0.090
H6	Interactivity→O2Osatisfaction	0.029	0.482	0.031	0.404
H7	Ubiquity→O2Osatisfaction	0.079	1.219	0.167	2.892**
H8	Tangibles→O2Osatisfaction	0.088	1.264	-0.008	0.104
H9	Reliability→O2Osatisfaction	0.217	2.936**	0.088	0.931
H10	Responsiveness→O2Osatisfaction	0.106	1.180	0.148	1.505
H11	Assurance→O2Osatisfaction	-0.006	0.066	0.069	0.790
H12	Empathy→O2Osatisfaction	0.160	1.975*	0.215	2.770**
H13	Perceived Fit→Attitude toward Extension	0.382	5.089***	0.636	13.525***
H14	Attitude toward Extension→Intention to Use Sequel Service	0.858	22.266***	0.859	34.560***
H15	O2Osatisfaction→Attitude toward Extension	0.484	6.163***	0.156	2.257*
H16	O2OLoyalty→Intention to Use Sequel Service	-0.004	0.082	-0.100	2.250*

Note: * $p < .05$, ** $p < .01$, *** $p < .001$, Supported hypothesis testing results of each case are highlighted in bold.

5. Discussion

As the mobile-based O2O industry grows, many existing O2O service providers are expanding their businesses by service diversification. According to this trend, the current study examined the effects of the parent service-related factors on the user adoption of a sequel service. Specifically, this study identified a total of ten dimensions encompassing the whole service delivery process that flows from a mobile app to an offline area. These dimensions were then assumed to affect O2O satisfaction, which in turn lead to O2O loyalty and attitude toward an extension. In addition, this study assumed the users' fit perception between the parent and the sequel O2O service would be another crucial antecedent of intention to use the sequel service, with mediation of attitude toward the service extension. Examining two different service extension cases was intended to provide more profound understanding of the present research topic. To that end, implications drawing from the comparison between the results of the two case analyses are discussed.

Results from both cases have confirmed that satisfaction with an O2O service was not only the significant predictor of loyalty to the service, but also that of attitude toward an extension. It implies that providing a satisfactory user experience of a service may be a core factor in enhancing the probability of using its sequel service as well as securing the loyalty user base.

As for the service quality dimensions, results reveals that different types of services yield different results on significance testing. For Case 1, out of the proposed service quality dimensions presumed to affect satisfaction, informativeness, security, reliability and empathy were found significant. On the other hand, data analysis for Case 2 showed that satisfaction was mostly derived from efficiency, ubiquity and empathy.

For online service quality of food delivery O2O services, users' perceived benefit from diverse, timely and useful information may be obvious as there are a lot of choice alternatives. In addition, the service's secure payment system and privacy may be another crucial attribute to user satisfaction, as users often use a direct in-app payment system when placing an order and have to enter their home address to get the food delivered. However, they may feel less certain about efficiency as a benefit. On the contrary, results reveal that users of taxi-hailing services consider efficiency the most important attribute in evaluating the service. This is mainly because the core value of such services lies in how easily and fast they can book a ride. They may not find informativeness relevant to their experience with the service, since the choice alternatives for the rides are largely undifferentiated at the point of booking. Security may also be considered irrelevant as Kakao doesn't provide in-app payment system for its taxi booking service at the moment. For e-scape, none of the cases showed a significant relationship with O2O satisfaction. This may imply that the design factors should be either considered ancillary to other service quality factors when evaluating a service or perceived as a pervasive and underlying component in today's mobile environment.

For O2O-specific service quality, only ubiquity was significant to satisfaction in Case 2. Fundamentally, taxi-hailing is a location-based service, and it is crucial whether users on the move can hail a taxi with ease whenever or wherever they want. However, when it comes to the food delivery service, users may less care about it as they mostly use the service at a fixed place such as their homes. Meanwhile, interactivity, operationalized as the availability of interaction with a service provider during the service delivery, was not significant in both cases.

It is presumably because not many users are accustomed to using the in-app interactivity function such as a messenger or a direct call.

Regarding offline service quality, reliability was found to be a significant antecedent of satisfaction in Case 1. For the food delivery O2O service, whether the delivery arrives within the expected time frame or the degree of which the service is reliable seems to be clearly related to O2O satisfaction. One of the most crucial findings of this study is that empathy significantly affected O2O satisfaction in both cases. This indicates that emotional aspects of the offline service may be more crucial in evaluating an O2O service than the functional ones. That is, no other than the caring and individualized attention of offline contractors are considered to be within the scope of the O2O service provider's responsibility. Therefore, it can be concluded that collaborative efforts with the offline contractors toward improving user experience will ultimately help the O2O service providers prosper. For the rest of the quality dimensions, users may not clearly relate these dimensions to the benefits of using a certain O2O service.

As expected, the hypothesis testing results for both cases confirmed the influence of perceived fit on attitude toward an extension, which then led to intention to use a sequel service. This corroborates the previous findings identifying perceived fit as one of the most important antecedents of the extension's success. Hence, O2O service providers launching a new O2O service could consider utilizing the resources of the parent O2O service to enhance the perceptual linkage with the service.

Lastly, this study assumed that O2O loyalty would positively influence intention to use a sequel service. However, none of the results supported the hypothesis. Moreover, results of Case 2 showed that O2O loyalty exerted a significant and negative effect on usage intention for the sequel service, leaving the room for further research. Possibly, a strong affection on a certain O2O service might be hard to be transferred to other services under the same brand. The intention to adopt a sequel service may be affected by attitude toward the extension, but not by loyalty to the parent O2O service. For KakaoT, as it originally belonged to the mobile messenger-based platform operator Kakao, some loyalty users might have concerns over excessive business diversification. In addition, the service is now at a critical point of monetization. For this reason, some users might not be favorable for the recent move that Kakao has made.

The original contribution of this study is conducting a user research on O2O service providers' service extension. Theoretically, this study combined service quality, loyalty theory and concepts from brand extensions into a single research model and empirically tested it in the O2O service context. In defining O2O service quality dimensions, not only an online area but also an offline area where the practical service is delivered and the unique characteristics of a mobile-based O2O service were considered. Furthermore, by analyzing and comparing two different services, namely a food delivery and a taxi-hailing service, this study provided more comprehensive and profound managerial implications.

Conducted as an exploratory research, the current study is not without limitations. First, there exists the possibility that less experienced service users have confounded the results. As seen in Table 1, more than 30 percent of the respondents for Case 1 and 50 percent for Case 2 answered they used the proposed O2O service less than 1-2 times a month. Second, this study focused on South Korea's two dominant O2O services of Baemin and KakaoT. Future studies could be carried out applying the present research topic to other types of O2O service. Lastly, regional factors might have affected the results. This study was conducted to South Korean mobile users. Since South Korea is comparatively well equipped with the mobile service ecosystem and wireless infrastructure, we must be cautious about the generalization of the findings.

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