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The Role of Korean Food Delivery Apps as a Third-Party Logistics Provider: Focusing on Self-Determination Theory

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ABSTRACT

Purpose: This study aim to examines the relationships between users' self-determination motivation, perceived utility and hedonic values, attitudes, and intentions to reuse the app. Additionally, the moderating effect of information search effort was explored.

Design/methodology/approach: Data were collected via online surveys targeting domestic consumers using K-FDA services. We used PLS-SEM for hypothesis testing.

Findings: The results suggest that K-FDA users perceive more value as they use the app with greater voluntary motivation, leading to higher attitudes and intentions to reuse the services. Additionally, hedonic value interacted with information search effort level to significantly influence attitude, indicating the need to encourage users to use K-FDA services more proactively.

Research limitations/implications: According to self-determination theory, an individual's autonomy can be distinguished into various stages ranging. Differences in perceived value and behaviors during the K-FDA usage process may emerge according to these stages. Therefore, it is suggested that future research conduct studies comparing differences by refining the degree of self-determination.

Originality/value: Despite the increasing distribution costs as Korean Food Delivery Apps (K-FDA) serve as third-party logistics providers, the number of K-FDA users is on the rise. In this context, there is a need to investigate users' motives and the values perceived during the use of the app to attract and retain users. Therefore, we adopted the Self-Determination Theory to examine the effects of intrinsic motivation on the perceived value (utilitarian and hedonic) during the app usage process and proposed the role of K-FDA in attracting users to the app and encouraging reuse in the fiercely competitive delivery app market.

Keywords: K-FDA (Korean food delivery application), Third-party logistics providers, Self-determination theory, Perceived values, Information search effort

I. Introduction

The proliferation of smartphones has led to the emergence of Online-to-Offline (O2O) platforms across

various industries. O2O platforms provide a transaction model that enables users to experience products and services online in a manner analogous to offline experiences. These platforms are widely applied across various industries, including dining, accommodation, travel, real estate, ticketing, and car rentals (Sun & Park, 2019). Among these, delivery apps are smart device applications that facilitate consumer delivery

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orders (Oh & Yi, 2023). In the hospitality industry, Food Delivery Application services (FDA) have caused significant diastrophisms (Kaur et al., 2021; Tandon et al., 2021). In South Korea, where information and communication technologies are highly advanced, delivery apps have experienced consistent growth over the past decade. Traditional flyer advertising incurs costs not only for printing but also for distribution. In contrast, Korean Food Delivery Applications (K-FDA) can attract customers online at a lower cost, serving as third-party logistics providers and playing an intermediary role in distribution. Consequently, dining establishments can easily attract customers online.

They also allow for quick and convenient food delivery, and even small-scale businesses can easily contact customers (Shin et al., 2015; Xu & Huang, 2019). Moreover, consumers can access various information and services, such as customer reviews, AI-driven personalized menu recommendations, and discount coupons (Kim et al., 2011).

Due to these advantages, the K-FDA market transaction volume, which was approximately 2.7326 trillion KRW in 2017, has explosively grown to 26.594 trillion KRW by 2022 (Kim, 2014). The variety of food available for delivery has also expanded significantly, from typical delivery foods (e.g., fried chicken, hamburgers, jjajangmyeon) to Korean side dishes, desserts, convenience store foods, and fresh produce.

However, using delivery apps increases the distribution channel by one step, resulting in potentially increased cost burdens for consumers. Korean delivery apps have faced numerous challenges due to intense competition between restaurants and increased intermediary fees and delivery charges, resulting in dissatisfaction among restaurant owners and consumers. Additionally, in conjunction with the endemic, the continued high inflation and high interest rates caused the market size to experience negative growth for the first time last year (Kim, 2014).

Despite these issues, consumer acceptance of the FDA is high due to lifestyle changes (Ray et al., 2019). FDA services are spreading globally in countries like the USA, China, and India and showing continuous growth. The K-FDA market has experienced rollercoaster-

like fluctuations, with periods of explosive growth followed by negative growth. However, research in this field is still in its early stages. However, research in this field is still in its early stages. There are few studies investigating the factors influencing the adoption and use of the FDA, such as consumer decision-making processes, attitudes, and value preferences (Kaur et al., 2021; Ray et al., 2019; Tandon et al., 2021; Xu & Huang, 2019). Previous studies on consumer behavior in K-FDA have primarily focused on theories related to technology usage and acceptance (e.g., Jung & Kim, 2020; Yeo et al., 2017), which may not sufficiently address the internal factors affecting consumers' use of K-FDA.

Particularly since the COVID-19 pandemic, the K-FDA market has grown rapidly, and consumer perceptions and behaviors toward the FDA have become more positive. However, the market still sees monopolistic practices maintained by certain K-FDAs (e.g., Baemin of Woowa Bros.) (Han et al., 2023), competitors (e.g., Coupang Eats) offering free delivery services, and some local governments developing public delivery apps, intensifying competition.

Due to intensified competition and the effects of negative growth, the key players in the K-FDA market (Baemin of Woowa Bros, Coupang Eats, Yogiyo) are expanding their quick commerce businesses or refining their existing operations to meet consumer needs. However, as businesses transition from growth to maturity, simply enhancing distribution strategies, such as improving the distribution structure, will no longer suffice to survive in the evolving market. To elicit long-term consumer behavior, understanding the fundamental factors that drive behavior, namely consumer psychology, is becoming increasingly crucial.

In this context, there is a need to investigate users' motives and the values perceived during the use of the app to attract and retain users. This study aims to understand the intrinsic motivations of consumers using K-FDA and explore the strategic directions businesses should pursue. Therefore, we adopted the Self-Determination Theory to examine the effects of intrinsic motivation on the perceived value (utilitarian and hedonic) during the app usage process. It is

assumed that high self-determination among users can lead to a more positive perception of value, fostering positive attitudes and intentions to reuse.

Consumers also seek external information (e.g., online searches, advertisements, platform information browsing) to make efficient purchases or reduce the uncertainty of purchasing, or they may enjoy the process of information seeking itself (Hwang, 2006). Consumers using O2O platforms like K-FDA may also devote effort to external information search due to these motivations. Generally, since information search is typically considered a loss due to its perceived costs, consumers attempt to minimize cognitive effort (Newman & Staelin, 1972). Therefore, consumers who invest more effort in external information search are likely to have higher desires to achieve personal goals compared to those who do not. Consequently, this study posited that if individuals with high levels of information-seeking effort perceive value during the process of using K-FDA, their desires would be fulfilled, leading to enhanced attitudes or intentions to reuse. Thus, we examined the moderating effect of information search effort.

In conclusion, this study explores the intrinsic aspects of consumers using K-FDA despite increased distribution logistics costs, aiming to enhance their understanding and to make strategic recommendations to facilitate positive use of K-FDA. Unlike previous studies that identified the behavioral intentions of K-FDA users from the perspective of technology acceptance, this study differentiates itself by applying the concept of self-determination, a variable commonly used in psychology, to the K-FDA environment to examine behavioral factors in detail. Through this, we aim to provide strategic marketing suggestions to practitioners who are focusing on changes in distribution lines so that consumers can positively use K-FDA. The structure and results of this study are expected to increase the potential for expansion and application not only in the K-FDA industry but also in various O2O industries such as accommodation, travel, and shopping.

II. Literature Review

A. Self-Determination of K-FDA Users

Human motivation is a crucial concept for explaining and predicting human behavior. In the increasingly competitive Korean Food Delivery App Service (K-FDA) market, understanding user traits and gaining a competitive edge are essential to attract users and encourage the use of one's app. This study examined the effects of users' voluntary and intrinsic motivations in the K-FDA context.

According to Self-Determination Theory, individual behavior is regulated by the degree of self-determination exhibited and is categorized into intrinsic and extrinsic motivations depending on the level of regulation (Deci & Ryan, 1985). The more self-determined the cause of an individual's behavior, the more it is driven by intrinsic motivation. The fundamental psychological needs influencing self-determination are the satisfaction and fulfillment of needs for autonomy, competence, and relatedness. These three psychological needs are considered universal attributes of humans (Lee & Kim, 2008).

Autonomy is perceived as the belief that the cause of one's actions is within oneself and that one is the agent and regulator of one's actions. This means that individuals act according to values that are integrated with their interests. Self-determination theory posits that autonomy is essential for competence to be effectively exerted, making it the most critical element among the three basic needs (Ryan, 1982, 1991). Autonomy also implies that individuals can autonomously choose and act on behaviors or values demanded or imposed by others. Thus, one can experience autonomy even when following others' directives (Ryan, 1993; Ryan & Lynch, 1989). Ryan and Deci (2000) categorized motivation from low to high autonomy as amotivation, external regulation, introjected regulation, identified regulation, and integrated regulation. Behaviors are increasingly self-determined and driven by intrinsic motivations as they approach integrated regulation.

The need for competence is fulfilled when individuals

use their capabilities or skills while interacting with their social environment (Ryan & Deci, 2000). Positive feedback that satisfies this need enhances intrinsic motivation and fosters confidence and efficacy through behavior (Ryan & Deci, 2006). Thus, feeling competent in performing target behaviors strengthens self-regulation and intrinsically motivated actions.

Relatedness refers to feeling connected to other people and society (Baumeister & Leary, 2017). Akin to the need for competence and autonomy, relatedness is integrally linked to intrinsic motivation. The more support one perceives from others regarding one's actions, the more intrinsically motivated one's exploratory activities become (Frodi et al., 1985; Ryan & Deci, 2002).

In summary, the more the needs for autonomy, competence, and relatedness are satisfied, the higher the self-determination of behavioral motivations. From this perspective, users may differ in their motives and behaviors with K-FDA depending on the level of their self-determination. They may also perceive the values experienced during K-FDA usage differently, shaping their attitudes and behavioral intentions accordingly.

Moreover, the Uses and Gratifications Theory, highly relevant to mobile device usage behavior, suggests that active receivers select, use, and consume media based on their social and psychological needs, achieving certain satisfactions (Sung & Lim, 2006). There are no existing studies that apply self-determination theory to O2O-related research, particularly to FDA. However, there are studies in virtual community-related research, such as SNS, that propose self-determination theory as a factor that activates user activities. In other words, individuals with higher self-determination tend to be more proactive in their mobile usage behaviors, experiencing enjoyment and engaging in information-sharing behaviors as a result (Yoon & Rolland, 2012; Wang, Jeong, Han, & Lee, 2022). Accordingly, this study supposes that proactive and voluntarily active users with high self-determination are more likely to use K-FDA more actively and voluntarily than those with lower self-determination who are more passive.

B. Self-Determination and Perceived Value (Utilitarian and Hedonic) of K-FDA Users

Perceived value is the overall evaluation of products and services based on the shopping experience (Zeithaml, 1988; Zeithaml et al., 2002). In offline purchasing environments, consumer judgment of value has been known to affect preferences, satisfaction, and loyalty (Cronin Jr et al., 2000). Consequently, efforts have been made in online purchasing environments to understand the value perceived by consumers and to satisfy their desired value (Overby & Lee, 2006).

The dimensions that constitute value have been diversified by many researchers. Among these, hedonic and utilitarian values are considered the most common dimensions (Babin et al., 1994; Overby & Lee, 2006).

Utilitarian value is defined as 'the overall evaluation of functional benefits' (Babin et al., 1994). It can be high when shopping is perceived as efficient and successful, considering price, quality, time-saving, and convenience. Utilitarian value derives from relatively tangible aspects, such as efficiently acquiring goods and services (Griffin et al., 2000).

Conversely, Hedonic Value is 'the overall evaluation of experiential benefits such as entertainment and escapism (Dhar & Wertenbroch, 2000). Consumers may shop solely for pleasure and a sense of liberation from reality (Babin et al., 1994). Hedonic value is an experience-oriented component, where emotional, social, and entertainment aspects experienced during shopping are perceived as beneficial. Unlike utilitarian value, it derives from relatively intangible aspects, such as pleasure (Larsen & Watson, 2001).

K-FDA features immediacy and playfulness, enabling users to perceive utilitarian and hedonic values (An et al., 2018).

For instance, K-FDA services offer information on various dining places and menu options that are available in the user's location at any time. These services possess relatively simple process for immediate ordering and payment, using smartphones. Users may also receive discount coupons based on their ratings or the timing of their orders. Recently, intensified competition has led more delivery apps to offer free delivery services.

Therefore, K-FDA users can easily enjoy food delivery services from home and sometimes benefit from lower prices than eating out. This immediacy and cost-effectiveness may lead consumers to perceive significant utilitarian value.

Moreover, using K-FDA services provides experiences of enjoyment, fun, and curiosity, which are aspects of playfulness (Park & Kwon, 2017). Playfulness is akin to hedonic value.

Meanwhile, self-determination is based on the psychological underpinnings of autonomy, competence, and relatedness. Users with high (as opposed to low) self-determination are more proactive in their actions and thus likely have greater efficacy (confidence) in using K-FDA. This study hypothesizes that users with high self-determination are more proactive in using K-FDA services and, consequently, perceive greater utilitarian and hedonic values.

Consumers with high self-determination who actively use the app service are likely to receive more practical benefits. For example, receiving an additional discount coupon in K-FDA or comparing prices involves significant time costs. Individuals with higher efficacy are more adept at selecting appropriate information from the vast array of online options (Han & Kim, 2013). Additionally, previous studies indicate that the playfulness associated with K-FDA services increases with an individual's innovativeness or self-efficacy (Park & Kwon, 2017). Therefore, this study anticipates that users with high self-determination will perceive more excellent hedonic benefits due to their proactive use of K-FDA services. Thus, the following set of hypotheses is proposed.

H1: The self-determination of K-FDA users will have a significant positive effect on perceived utilitarian value.

H2: The self-determination of K-FDA users will have a significant positive effect on perceived hedonic value.

C. Perceived Value and Attitude towards K-FDA

Attitude is a learned predisposition to consistently respond favorably or unfavorably to a specific object. In the Theory of Planned Behavior, attitude refers to an individual's positive or negative evaluation or actions toward a particular phenomenon (Hikmah et al., 2023). Once formed, attitudes tend to be long-lasting and resistant to change, often playing a significant role (Cohen & Areni, 1991). Such attitudes are known to influence behavioral intentions and actual behaviors directly. Therefore, fostering a positive attitude among K-FDA users is crucial.

Previous studies have shown that consumers' utilitarian and hedonic values influence their attitudes (e.g., Yang et al., 2021; Yang & Lee, 2010). Suppose the shopping experience satisfying utilitarian values is favorable. In that case, it can lead to a positive attitude towards the store, while hedonic shopping values can also affect the overall evaluation of the store through the elicitation of positive/negative emotions (Ahn & Lee, 2011; Mano & Oliver, 1993).

In studies related to K-FDA, both functional and emotional values of delivery app service users have had a significant positive effect on attitudes (Kim et al., 2022). Functional value is similar to utilitarian value, and emotional value is similar to hedonic value. Thus, the following set of hypotheses is proposed.

H3: The Perceived utilitarian value of K-FDA users will have a significant positive effect on Attitudes.

H4: The Perceived hedonic value of K-FDA users will have a significant positive effect on Attitudes.

D. Perceived Value and Reuse Intention of K-FDA

Reuse intention refers to consumers' tendency to repeatedly use a specific business or product in the future (Sirdeshmukh et al., 2002). Furthermore, it

represents the willingness to reuse existing products and services despite competitors' marketing efforts to attract customers (Mano & Oliver, 1993; Oliver, 1999).

Meanwhile, the value consumers perceive is a vital motivational factor for behavior. Therefore, perceived value plays a crucial role in predicting future behavioral intentions, and the higher the value perceived by customers, the more likely they are to repeat the same behavior (Overby & Lee, 2006).

From the perspective of K-FDA users, if they perceive high utilitarian value due to efficient service purchases or hedonic value such as pleasure and playfulness during the purchasing process, their intentions to use K-FDA services in the future can be expected to increase.

Similarly, in the context of mobile commerce, the perception of utilitarian and hedonic values regarding omnichannel has positively impacted reuse intentions (Shin & Oh, 2017). Additionally, the perceived usefulness of delivery apps has positively influenced the intention to continue using them (Cho & Nam, 2022). Jeon et al. (2016) found that the perception of enjoyment from using delivery apps significantly positively impacted reuse intentions.

Based on these observations, this study hypothesized that the perception of utilitarian and hedonic values while using K-FDA will positively impact reuse intentions. Thus, the following set of hypotheses is proposed.

H5: The perceived utilitarian value of K-FDA users will have a significant positive effect on Attitudes.

H6: The perceived hedonic value of K-FDA users will have a significant positive effect on Attitudes.

E. Attitude towards K-FDA and Reuse Intentions

The relationship between attitude, behavioral intentions, and behavior has been extensively studied within business management. Specifically, a favorable

attitude increases the likelihood of action, whereas past behavioral experiences can influence future attitudes (Ajzen & Fishbein, 1975; Lee et al., 2000). Therefore, reuse or repurchase manifests how consumer beliefs and attitudes translate into actions, indicating that dissatisfied customers are less likely to engage in reuse (Sohn & Park, 2013).

Similarly, numerous studies on delivery apps have confirmed that user attitudes precede intentions for continued use and reuse (e.g., Jeon et al., 2016).

Based on these insights, this study posits that K-FDA users' attitudes towards the service will influence their intentions to reuse it, leading to the following hypothesis.

H7: The attitudes will have a significant positive effect on Reuse Intentions.

F. The Moderating Effect of Information Search Effort

Consumers engage in information searches to address immediate problems. Information search can be broadly divided into two types based on the source of information. One is the internal search process, which involves retrieving information from memories. The other is the external search process, where information is sourced from various external channels, such as online searches, friends, and media advertisements (Hwang, 2001).

Such efforts to gather relevant knowledge or information from the external environment to purchase a specific product or service constitute an information search effort (Smith & Beatty, 1985). There are several reasons why consumers put much effort into information searching. Among these, searching for external information to resolve problems or to reduce the uncertainty associated with purchasing products and services (i.e., pre-purchase search) is standard (Hwang, 2001; Urbany et al., 1989). However, information searching is not always used to make a purchase. Occasionally, consumers engage in ongoing searches for the sheer pleasure of searching or due to their

interest in products and services, irrespective of making a purchase (Howard, 1977; Hwang, 2001).

Consumers who invest substantial effort in information searching demonstrate high motivation or desire for their search activities. They also strive to obtain significant search benefits (both monetary and psychological) relative to the costs (monetary and non-monetary) involved (Goldman & Johansson, 1978; Urbany et al., 1989). Motivation provides the energy to activate consumer behavior and determines the direction of behavior (Schiffman Leon, 1991).

In this context, delivery app users may also vary in their effort to search for external information depending on their objectives. K-FDA users who invest substantial effort in information search will likely use the app more actively to achieve their goals. If this process leads to a higher perception of utilitarian and hedonic values, it can satisfy desires, enhance attitudes, and reuse intentions. Thus, the level of information search effort can mediate the relationship between perceived value, attitude, and reuse intentions. Thus, the following set of hypotheses is proposed.

- H8:** The level of information search effort will moderate the relationship between K-FDA users' perceived value (utilitarian and hedonic) and their attitudes and reuse intentions.

III. Research Design

A. Research Model

This study established a research model to analyze the impact of self-determination on Korean delivery app service users, their perceived utilitarian and hedonic values, and their attitudes and intentions to reuse, as well as to explore the moderating role of information search effort (See Figure 1).

B. Measurement of Variables

All the items of analysis are measured in the 7-point Likert scale in this study.

1. Self-determination

This study defines self-determination as "the degree to which an individual's behavioral motivations are intrinsically motivated." Self-determination was measured using five items, adapted from the research by Sheldon and Deci (1993) and Nicol (2005), to suit the context of this study.

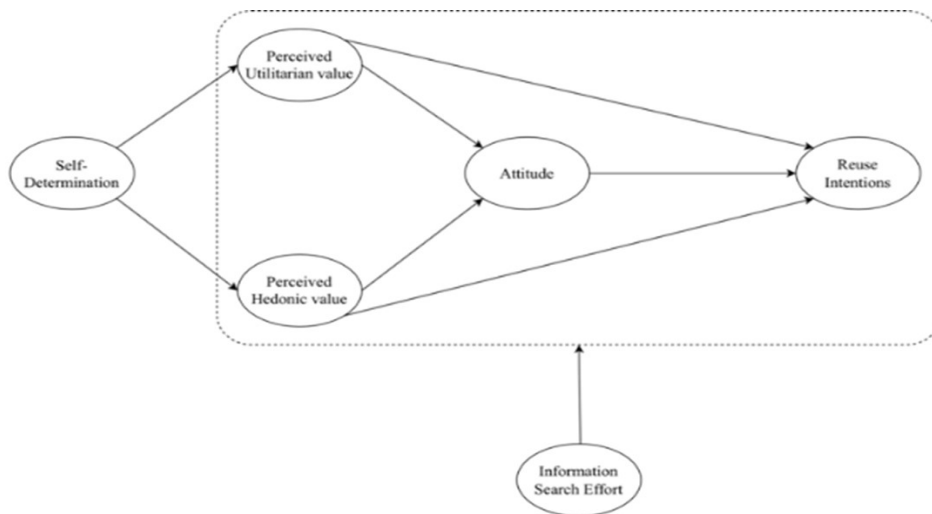


Figure 1. Research model

2. *Perceived utilitarian value and hedonic value*

In this study, utilitarian value is defined as "the overall evaluation of functional benefits perceived when using K-FDA," and it was measured using five items adapted from Babin et al. (1994) research to fit the context of this study. Hedonic value is defined as "the overall evaluation of experiential benefits perceived when using K-FDA," and it was measured using three items similarly adapted from Babin et al. (1994).

3. *Attitude*

In this study, attitude is defined as "users' preference towards K-FDA," and was measured using five items adapted from Yeo et al. (2017) to suit the context of this study.

4. *Reuse intention*

In this study, reuse intention is defined as "the likelihood that K-FDA users will revisit the app for service usage." It was measured using three items adapted from Bao and Zhu (2022) to fit the context of this study.

5. *Information search effort*

In this study, information search effort is defined as "the extent to which K-FDA users search for and utilize online information," and was measured using three items, adapted from Bigné-Alcañiz et al. (2008), to suit the context of this study.

IV. Research Methods

A. Data Collection and Analysis Method

The survey for this study was conducted over the course of one month in August 2023, targeting users with experience using online delivery apps.

A total of 435 questionnaires were collected

through self-administration. Of these, 415 responses were used for the final analysis after excluding 20 insincere responses. Based on the collected data, this study utilized SmartPLS 4.0 to validate the structural causal relationships (Structural Equation Modeling, SEM).

B. Assessing Validity and Reliability

SmartPLS 3.0 verified the unidimensionality of all constructs in the research model (Hair Jr et al., 2016; Hair Jr et al., 2017). Initially, a reliability coefficient analysis was conducted to assess Cronbach's alpha and composite reliability (CR) and verify the reliability of all constructs. The results showed that both Cronbach's alpha (.858-.946) and CR (.912-.948) exceeded the accepted threshold of .7, demonstrating high internal consistency. Next, convergent and discriminant validity were assessed. The factor loading values (.717-.958) surpassed the acceptable threshold of .7, and the average variance extracted (AVE: .628-.903) exceeded the acceptable threshold of .5, confirming convergent validity (See Table 2). Discriminant validity is established if the square root of AVE, according to the Fornell-Larcker criterion, is larger than other correlation values among the latent constructs. As shown in Table 3, the square root of AVE (>.950) was larger than all correlation coefficient values (<.723), confirming that discriminant validity is well established (Hair et al., 2006) (See Table 3).

C. Hypotheses Testing

1. *Assessment of structural model*

The structural model was assessed to validate all hypotheses in this study using SmartPLS 3.0, according to the following criteria. The analysis results are presented below. Firstly, the revised R^2 values for Utilitarian Value (.024), Hedonic Value (.018), Attitude (.549), and Reuse Intention (.560) demonstrate that

Table 1. Demographic profiles(n=415)

Variable	Category	Frequency	%
Gender	Male	194	46.7
	Female	221	53.3
Age	20-29 years	104	25.1
	30-39 years	99	23.9
	40-49 years	104	25.1
	50 years over	108	26.0
Marriage	Marriage	200	48.2
	Non marriage	215	51.8
Categories of delivery food	Korean Food	21	6.6
	Fast Food (e.g., Hambergur)	20	6.3
	General Food (e.g., Pizzaa/Chicken, Chinese food)	229	71.6
	Bakery	10	3.1
	Coffee/Beverage	39	12.2
	Other	1	.3
Cost per person (KRW)	Less than 10,000	122	38.1
	10,000 to less than 20,000	99	30.9
	20,000 to less than 30,000	60	18.8
	30,000 to less than 40,000	18	5.6
	40,000 to less than 50,000	5	1.6
	50,000 to less than 60,000	8	2.5
	60,000 and above	8	2.5

Table 2. Measurement model/confirmatory factor analysis

Variable	Factor Loadings	α	CR	AVE
Self-Determination		.858	.913	.628
I always feel like I choose the things I do.	.781			
I feel like I am always completely myself.	.758			
When I accomplish something, I always feel it's me who did it.	.791			
I am free to do whatever I decide to do.	.831			
I feel pretty free to do whatever I choose to.	.801			
Utilitarian Value		.841	.847	.614
Using mobile (online) food ordering services enables efficient expenditure.	.809			
Using mobile (online) food ordering services allows you to find the menu you want.	.860			
Using mobile (online) food ordering services is perceived as an intelligent choice.	.786			
Using mobile (online) food ordering services allows for rational spending.	.736			
Using mobile (online) food ordering services results in time savings.	.717			
Hedonic Value		.898	.948	.827
Using mobile (online) food ordering services is fun.	.925			
Using mobile (online) food ordering services is enjoyable.	.877			
Using mobile (online) food ordering services is comparable to entertainment.	.925			

Table 2. Continued

Variable	Factor Loadings	α	CR	AVE
Attitude		.909	.912	.734
Ordering food through mobile (online) food ordering services is wise.	.866			
Ordering food through mobile (online) food ordering services is considered beneficial.	.885			
Ordering food through mobile (online) food ordering services is rational.	.877			
Ordering food through mobile (online) food ordering services is rewarding.	.796			
Overall, there is a favorable opinion regarding orders placed through mobile (online) food ordering services.	.857			
Reuse Intention		.946	.947	.903
There are plans to use mobile (online) food ordering services.	.945			
I intend to use mobile (online) food ordering services.	.958			
I am interested in trying mobile (online) food ordering services.	.948			
Information Search Effort		.898	.941	.826
When dining out, online searches are used to decide where to go.	.945			
When dining out, I use online searches to decide what to eat.	.958			
I use online searches to plan my weekends and leisure activities.	.948			

Table 3. Criterion, mean, and standard deviation

Variable	1	2	3	4	5	6
1. Self-Determination	.793	.176	.150	.088	.109	.134
2. Utilitarian Value	.155	.783	.550	.806	.681	.211
3. Hedonic Value	.135	.500	.909	.582	.452	.075
4. Attitude	.081	.708	.538	.857	.774	.164
5. Reuse Intention	-.009	.607	.443	.723	.950	.153
6. Information Search Effort	.129	.185	.076	.156	.145	.909
Mean	4.545	5.388	5.172	4.776	5.186	4.934
SD	1.242	.935	.989	1.043	1.319	1.287

Note: Bold numbers indicate the square root of AVE. Above the diagonal of the square root of AVE value is Heterotrait-Monotrait Ratio (HTMT) and below is Fornell locker criterion.

the explanatory power for the dependent variables is higher than zero, as suggested by Cohen (1998), indicating a good fit of the model. Additionally, the predictive power of the model was confirmed as the root mean square residual (SRMR) is .071, which falls below the acceptable threshold of .08 (See Table 3).

2. The hypotheses testing result of structural model

The SEM results investigating the impact of self-determination by K-FDA users on perceived

values (utilitarian and hedonic), attitude, and reuse intention are presented in Table 2. Initially, the analysis revealed that users' self-determination significantly influences utilitarian value ($\beta = .155$, $t\text{-value} = 3.043$, $p = .002$) and hedonic value ($\beta = .135$, $t\text{-value} = 2.373$, $p = .018$). Thus, H1 and H2 are supported. This is one of the few results that empirically demonstrate the positive impact of self-determination on perceived value in the K-FDA environment. According to the analysis, as expected, consumers with high self-determination, including

Table 4. Structural estimates (PLS)

	Path		Estimate	t-value	p	Results
H1	Self-Determination → Utilitarian Value		.155	3.043	.002	Supported
H2	Self-Determination → Hedonic Value		.135	2.373	.018	Supported
H3	Utilitarian Value → Attitude		.585	13.516	.000	Supported
H4	Hedonic Value → Attitude		.234	4.745	.000	Supported
H5	Utilitarian Value → Reuse Intention		.206	3.041	.002	Supported
H6	Hedonic Value → Reuse Intention		.025	.533	.594	Non-Supported
H7	Attitude → Reuse Intention		.545	9.178	.000	Supported
H8-1	Information Search Effort *Utilitarian Value → Attitude		-.010	.222	.825	Non-Supported
H8-2	Information Search Effort *Hedonic Value → Attitude		.130	2.486	.013	Supported
H8-3	Information Search Effort *Utilitarian Value → Reuse Intention		-.016	.230	.818	Non-Supported
H8-4	Information Search Effort *Hedonic Value → Reuse Intention		-.016	.230	.818	Non-Supported
H8-5	Information Search Effort *Attitude → Reuse Intention		-.097	1.759	.079	Non-Supported
Dependent Variable					R^2	
Utilitarian Value					.024	
Hedonic Value					.018	
Attitude					.549	
Reuse Intention					.560	

autonomy, competence, and relatedness, are more proactive in using K-FDA and perceive greater usefulness and enjoyment from app usage. Furthermore, both utilitarian value ($\beta = .585$, $t\text{-value} = 13.516$, $p = .000$) and hedonic value ($\beta = .234$, $t\text{-value} = 4.745$, $p = .000$) significantly influence attitude, supporting H3 and H4. This result is similar to the findings of many previous studies (e.g., Yang & Lee, 2010). Utilitarian value also significantly impacted reuse intention ($\beta = .206$, $t\text{-value} = 3.041$, $p = .002$), while hedonic value did not significantly affect reuse intention ($\beta = .025$, $t\text{-value} = .533$, $p > .05$), supporting H5 but not H6. Lastly, it was found that attitude significantly affects reuse intention ($\beta = .545$, $t\text{-value} = 9.178$, $p = .000$), thus supporting H7. This result is slightly different from our expectations. Previous studies found that hedonic value significantly influenced reuse intention, but in our study, hedonic value did not have a significant impact on reuse intention. Instead, it affects reuse intention indirectly by mediating attitude. This suggests that merely experiencing enjoyment from using K-FDA is not enough; a positive attitude toward the app must be

formed through that enjoyment to increase reuse rates.

Additionally, the moderating effect of information search effort on the relationships between perceived values, attitude, and reuse intention was examined (H8-1 to H8-5). The analysis indicated that the interaction between information search effort and hedonic value significantly influenced attitude ($\beta = .130$, $t\text{-value} = 2.486$, $p < .013$), supporting only H8-2 (See Table 4).

V. Conclusions

A. Theoretical Implications

Delivery apps play a role as third-party logistics providers in facilitating transactions by efficiently connecting sellers with consumers. This study aims to find implications about K-FDA roles from the perspective of consumers, focusing on how delivery apps are chosen by consumers and how they contribute to the efficient management of sellers, particularly

restaurant owners.

The theoretical implications derived from the results of this study are as follows.

First, this study adopted the Self-Determination Theory to examine the effectiveness of intrinsic motivation within the context of K-FDA-related research. Unlike previous studies that examined consumer intent to use delivery apps from the perspective of Technology Acceptance Model(TAM), this research contributes theoretically by identifying motivational factors that facilitate consumer behavior from an intrinsic perspective.

Second, this study is the first to elucidate the relationship between the self-determination of K-FDA users and their perceived values (utilitarian and hedonic). The findings revealed that consumers with high autonomy, competence, relatedness, and self-determination can perceive greater utilitarian and hedonic values through active app usage.

Third, the study clarified the positive relationships between perceived utilitarian and hedonic values and attitudes during K-FDA usage. The positive relationship between perceived value and attitude, previously validated in other studies, was also demonstrated in the K-FDA context.

Fourth, hedonic value did not directly influence reuse intention. Instead, attitude played a mediating role, indirectly influencing reuse intention. This underscores the importance of forming a positive attitude through app usage. The results showed that the interaction between information search effort and hedonic value creates a positive attitude. This implies providing more engaging in-app information to users with considerable effort in information search would be necessary.

This indicates the need for K-FDA to provide more attractive in-app information to users who invest significant effort in information search.

B. Practical Implications

The practical implications of this study are as follows. First, the results show that the self-determination

of delivery app users positively influences utilitarian and hedonic values. This implies that consumers must actively use the delivery app to recognize its value. Therefore, delivery apps must create an environment encouraging proactive consumer participation. Numerous public delivery apps failed to establish a thriving market presence and subsequently disappeared, possibly due to their limitation in creating an environment conducive to active consumer participation. For example, consumers with high self-determination also tend to have high relatedness, leading to more active use of online communities such as SNS (Wang, Jeong, Han, & Lee, 2022). Therefore, K-FDA could create in-app communities to promote healthy eating habits and enhance consumers' self-determination. In these in-app community boards, residents who live in proximity could engage in activities such as campaigns to reduce the use of environmentally harmful delivery containers or share information about their favorite restaurants.

Secondly, for consumers to form a positive attitude toward the delivery app and to continue using it, the app's benefits must be perceived as substantial. This means that to delivery apps must continuously strive to offer practical and enjoyable content in order to retain users. For example, delivery apps could simplify the search process for hungry consumers by allowing them to create and pre-save their own menus or enhance enjoyment by offering rewards or game notifications available at certain times.

Thirdly, hedonic information can be further provided to those users who invest significant effort in information search. For instance, through CRM, consumers who put a lot of effort into information search can be identified. It can be assumed that the more quantity and diversity of information searched, and the longer the duration of stay for K-FDA users, the more effort they put into information search. Therefore, K-FDA needs to identify the level of users' information search effort and provide tailored information. Ensuring that customers experience pleasure by providing the information they want remains a challenge for delivery apps to continuously improve.

C. Limitations of the Study and Future Research Directions

Despite deriving the implications discussed earlier, this study has the following limitations. Firstly, this study measured the degree of user self-determination on a continuous scale. However, according to self-determination theory, an individual's autonomy can be distinguished into various stages ranging from amotivation to integrated regulation depending on the degree of autonomy. Differences in perceived value and behaviors during the K-FDA usage process may emerge according to these stages. Therefore, it is suggested that future research conduct studies comparing differences by refining the degree of self-determination.

Secondly, this study focused on consumer research from the perspective of K-FDA among many O2O industries. However, the results of this study can be similarly applied to O2O platforms in other industries. Therefore, future research should include comparative studies encompassing various O2O platforms, such as dining, accommodation, travel, and shopping, to increase the generalizability of the results.

Thirdly, this study conducted self-reported surveys with consumers who have experience using K-FDA. This survey method may involve biases such as social desirability bias and inaccurate self-assessment. Therefore, future research should plan to complement the methods of this study by incorporating qualitative research (e.g., focus group interviews), experiments, and other approaches.

Lastly, consumers' effort in information search can be utilitarian or hedonic depending on the search objectives. However, this study measured information search effort not based on objectives but on search dependence. Future research could examine consumers' search effort focusing on desires, motivations, and other factors. Specifically, investigating how behavioral intentions vary depending on the types of effort exerted by K-FDA users could provide better practical insights.

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