Permasih et al. *Journal of Consumer Sciences* (2024), *9*(3), 315-337
DOI: https://doi.org/10.29244/jcs.9.3.315-337

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CONSUMER BEHAVIOR | RESEARCH ARTICLE

Intention to Use and Over-Ordering in Online Food Delivery Services: An Extension of the Theory of Planned Behavior

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Article history:
Received
August 12, 2024

Revision submit
August 21, 2024
October 01, 2024
October 29, 2024

Accepted
November 06, 2024

Avalaible online
November 30, 2024

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Abstract: Online food delivery (OFD) services can shape consumer habits through regular use. Although promotions attract consumers, they may also encourage food waste. This study analyzes factors influencing the intention to use OFD services and over-ordering behaviors by extending the Theory of Planned Behavior (TPB) with variables such as sales promotion and leftover reuse. The study used purposive sampling and collected data from an online survey of 253 OFD service users in Jabodetabek. Descriptive analysis and Partial Least Squares-Structural Equation Modeling (PLS-SEM) were applied. Results showed that most of the OFD users in this study were female residents of Bogor and Jakarta, aged 25 - 35 years old, single, holding a bachelor's degree, employed, with monthly incomes of IDR5,000,000 and IDR10,000,000, and spending IDR1,000,000 - IDR2,000,000 per month on food. Intention to use was influenced by attitude and subjective norms, while over-ordering was influenced by sales promotion and intention to use. The leftover reuse variable did not significantly influence the intention to use or over-ordering. Implications include encouraging continued OFD use through targeted advertising and features to help users manage consumption behavior, such as setting order reminders, providing nutritional information, and offering personalized portion recommendations. This study's novelty lies in introducing a new variable and demonstrating that sales promotions can encourage over-ordering.

Keywords: customer, intention to use, online food delivery service, over-ordering, theory of planned behavior

JEL Classification: L66, L84, M31, M37

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PUBLIC INTEREST STATEMENT

Online food delivery services have become part of everyday life in the digital era. However, over-ordering, where consumers order more food than needed, can be encouraged by frequent sales promotions and varying consumers behavior towards this service. Given diverse consumer behaviors towards online food delivery, this study applies the theory of planned behavior, incorporating sales promotion and leftover reuse as key variables. Sales promotion can impact purchasing decisions, and the findings aim to help food service providers understand consumer behavior, develop strategies to minimize over-purchasing, and promote sustainable food consumption.

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1. Introduction

A key advancement in digital services is the rise of online food delivery services, which are increasingly popular in Indonesia. According to We Are Social (2021), OFD usage in Indonesia reached 74.40%. Additionally, Rakuten Insight survey on Statista (2023), of 10,984 respondents from April 13 to 30, 2023, showed that 22% of respondents in Indonesia order food via online food delivery several times a month, while 6% do so several times a day. People use online food delivery services for various reasons, including convenience, time-saving, and access to diverse restaurant options (Das, 2018; Novita & Husna, 2020; Peemanee & Wongsahai, 2021; Prabowo & Nugroho, 2019; Yeo et al., 2017). Additionally, the COVID-19 pandemic in 2020 has increased home food deliveries (Baker et al., 2020).

Online food delivery (OFD) services have altered consumer behavior, leading to habitual usage (Chai & Yat, 2019). The growth of the OFD business has intensified competition, driving services to offer promotions, such as purchasing larger quantities of food. However, these promotions raise concerns about promoting food waste (Liu et al., 2021; Zhang et al., 2022). In 2017, Indonesia was the second-largest producer of food waste (The Economist Intelligence Unit, 2017). The consumption chain is the primary contributor to food waste within Indonesia's supply chain (National Development Planning Agency (Bappenas), 2021). Data from the National Waste Management Information System indicates that households accounted for 42% of national waste in Indonesia from 2018 to 2023. This issue arises from the habit of ordering large portions and a lack of awareness about the social and environmental impacts of food waste. The high levels of food waste in Indonesia may result from changing consumer preferences and insufficient public education.

Food waste in Indonesia is expected to rise due to increasing consumption activities. A UNEP report from 2021 estimated that approximately 931 million tons of food waste were generated in 2019, with 61% originating from households, 26% from food services, and 13% from retail. The National Waste Management Information System indicates that households remain the primary source of waste. At the consumption stage, 80% of waste originates from households, while the remaining 20% comes from non-household sectors. Approximately 44% of food waste consists of edible leftovers. Bappenas (2021) identifies excess portion sizes and consumer behavior as key contributors to food waste.

Several studies have explored over-ordering in delivery services by extending TPB. Shankar et al. (2022) demonstrated a relationship between attitude, subjective norm, and intention to use. Along with the role of trust, intention to use, and leftover reuse in the shopping routine. Shankar et al. (2022) also introduced relevant moderating variables, including willingness to pay for eco-friendly packaging and years of experience using food delivery apps. Talwar et al. (2022) demonstrated a positive relationship between attitude, subjective norm, and the intention to reuse leftovers in relation to over-ordering behavior. They further identified the moderating effects of age and gender on the relationship between subjective norms and over-ordering. Inthong et al. (2022) noted that attitude and subjective norms influence consumer behavioral intentions. Zheng et al. (2023) found a positive and significant relationship between attitude, subjective norms, perceived behavioral control, and over-ordering behavior. This study introduced variables such as sales promotion, demonstrating that discounts and promotions significantly impact purchasing decisions (Ayatinha et al., 2022), actual use of online food delivery services (Prasetyo et al., 2021), and impulsive buying (Baskara, 2015).

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Further research is needed to explore food waste caused by excessive purchases from online food delivery services. This study extends the theory of planned behavior to the context of online food delivery services, emphasizing two additional variables related to the use of online food delivery services and over-ordering. First, sales promotions, such as discounts or special offers, can enhance the appeal of these services, encouraging consumers to order more frequently or place excessive orders. Second, leftover reuse refers to consumers' intention to repurpose or manage unfinished food from these orders. Third, this research examines the factors influencing the intention to use OFD services and over-ordering among consumers in the Jabodetabek area. It also aims to identify consumer characteristics and usage patterns of online food delivery services. The results provide insights into these consumer characteristics and usage of online food delivery services for ordering food, as well as the factors that influence the intention to use online food delivery services and the tendency to over-ordering. Additionally, it seeks to identify consumer characteristics and usage patterns of online food delivery services. The results provide insights into these consumer characteristics and usage patterns, along with the factors influencing the intention to use these services and the tendency to over-ordering.

2. Literature Review

2.1 Theory of Planned Behavior (TPB)

TPB extends the theory of reasoned action by incorporating a variable called perceived behavioral control, which influences both intention and behavior. According to Ajzen (1991), this theory suggests that people act thoughtfully, considering the consequences and risks of their actions. Therefore, attitude, subjective norms, and perceived behavioral control can influence behavioral intention in TPB. Given its popularity, previous research has applied TPB to examine consumer behavior in several contexts, including the intention to use online food delivery services (Belanche et al., 2020; Pitchay et al., 2022; Shankar et al., 2022), over-ordering (Talwar et al., 2022; Yu et al., 2021; Zheng et al., 2023), and continued usage behavior (Tran, 2021).

2.2 The Effect of Attitude on Intention to Use Online Food Delivery Services

Attitude toward behavior refers to an individual's evaluation, characterized by favorable or unfavorable judgment about a specific action (Sari et al., 2023). Attitude plays a crucial role in influencing behavior and the intention to perform action, particularly in consumer behavior (Hung et al., 2016). In this context, it reflects consumers' pleasure and satisfaction derived from using online food delivery services (Ray et al., 2019). Previous studies have established a relationship between attitude and the intention to use online food delivery services. Shankar et al. (2022) found that consumers with a positive attitude toward online food delivery services are more likely to place orders. Similarly, Belanche et al. (2020) identified attitudes toward food delivery services as significant predictors of consumers' intention to use them. Inthong et al. (2022) indicated that attitudes directly and positively influence the intention to use online food delivery services for ordering food. Pitchay et al. (2022) found that attitude positively impacts this intention, particularly due to the application's assistance in food selection. Similarly, Jun et al. (2022) demonstrated that attitude is a significant factor influencing the intention to use online food delivery services.

H1: Attitude influences the intention to use online food delivery services

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2.3 The Effect of Subjective Norms on Intention to Use Online Food Delivery Services

Subjective norms arises from normative influences and an individual's tendency to align with certain beliefs (Sari et al., 2023). This concept reflects expectations from one's social environment, such as friends, parents, colleagues, and other related parties. In this study, subjective norms refer to the social perceived by individuals regarding their intention to use online food delivery services for purchasing food. For example, the influence of people around consumers can shape their decision to order food. Students have shown that subjective norms positively influence the use of online food delivery services (Chen et al., 2020; Ray et al., 2019; Shankar et al., 2022). Shankar et al. (2022) found that subjective norms play a crucial role in shaping consumer intentions, increasing their motivation to place orders and the likelihood of utilizing these services in the near future. Similarly, Belanche et al. (2020) demonstrated that subjective norms significantly influence behavioral intentions in the context of food delivery services, suggesting that the opinions of family, friends, and peers strongly impact individuals' decisions to use these services. Subjective norms are strongly related to adopting online food delivery services (Troise et al., 2021). Inthong et al. (2022) found that, alongside attitude, subjective norms influence the continued intention to use, especially when individuals receive advertisements for online food ordering from people around them.

H2: Subjective norms influence the intention to use online food delivery services.

2.4 The Effect of Perceived Behavioral Control on Intention to Use Online Food Delivery Services

Perceived behavioral control refers to an individual's belief in their ability to perform a behavior (Ajzen, 2020), encompassing factors that may facilitate or hinder the behavior (Sari et al., 2023). Perceived behavioral control can influence technology adoption, as consumers are more likely to adopt new technology when they believe they have the resources and abilities to use it (Arora & Sahney, 2018). If someone decides to use an online food delivery service and knows how to use it, it will lead to the use of the service (Belanche et al., 2020).

H3: Perceived behavioral control influences the intention to use online food delivery services

2.5 The Effect of Sales Promotion on Intention to Use Online Food Delivery Services and Over-Ordering

Promotion is a key strategy for business actors. Aiming to increase product visibility and attract consumers (Widyastuti & Sulistyowati, 2021). Sales promotions, such as discounts, are commonly used to boost short-term sales and enhance customer satisfaction (Yoopetch et al., 2022; Hasbi et al., 2022). Discounts significantly and positively influence interest, choice, and satisfaction with food ordering services. Previous research indicates that business actors often use digital coupons on third-party platforms to increase profits (Jiang et al., 2021). Promotions significantly and positively influence purchasing decisions (Ayatinha et al., 2022), impulsive buying (Baskara, 2015), satisfaction and loyalty to online food delivery services (Prasetyo et al., 2021), as well as food waste behavior (Di Talia et al., 2019). Online food delivery services providing discount coupons and free delivery services are likely to enhance customers' perception of purchasing a product. Therefore, in this study, promotions offered by online food delivery services are expected to positively influence intention to use and the tendency to over-order.

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H4: Sales promotion influences the intention to use online food delivery services.
H5: Sales promotion influences over-ordering.

2.6 The Effect of Leftover Reuse on Intention to Use Online Food Delivery Services and Over-Ordering

Leftover reuse can be defined as one of the main ways to reduce food waste at home (Aloysius et al., 2023). Leftover reuse is a vital household waste prevention routine (Bravi et al., 2020). It is considered one of the most effective strategies at the household level (Secondi et al., 2015). Using online food delivery services, consumers can order large quantities of food, allowing them to reuse leftovers from excessive ordering, which may contribute to food waste. Previous research indicates that most consumers struggle to accurately predict their food needs when ordering online food (Kapoor and Vij, 2018; Yeo et al., 2017). There is a positive relationship between leftover reuse and over-ordering in online food delivery services (Shankar et al., 2022; Talwar et al., 2022).

H6: Leftover reuse influences the intention to use online food delivery services.
H7: Leftover reuse influences over-ordering.

2.7 The Effect of Intention to Use Online Food Delivery Services on Over-Ordering

Intention refers to an individual's willingness to perform a particular behavior or can be assumed to motivate themselves in influencing behavior, how complicated the individual is willing to try, and how much effort they plan to exert. Shopping routines can also contribute to food waste in food ordering (Sharma et al., 2021). The intention to use online food delivery services significantly affects consumers' tendency to over-order food (Shankar et al., 2022), which is caused by discounts attractions towards consumers to buy more food (Sharma et al., 2021). Such promotions can positively influence repeat purchases of online food delivery services (Yoopetch et al., 2022).

H8: Intention to use online food delivery services influences over-ordering

2.8 Over-Ordering

Over-ordering behavior is when an individual purchases more food or a greater variety of food than is necessary or can be consumed (Barone et al., 2019; Visschers et al., 2016). Over-ordering involves consumer behavior, including purchasing large quantities (Shankar et al., 2022; Talwar et al., 2022). Over-ordering sometimes results from consumers purchasing excessively large products that are unsuitable for individuals living alone or in pairs, as well as the availability of larger packages at relatively lower prices (Graham-Rowe et al., 2014). Previous research on over-ordering includes topics such as over-ordering behavior in online food delivery (Sharma et al., 2021; Talwar et al., 2022), social dining (Wang et al., 2022), and over-ordering at restaurants (Yu et al., 2021; Zheng et al., 2023). Shankar et al. (2022) found that many individuals use online food delivery services to save time and energy, as they do not need to cook to prepare food. Yu et al. (2021) stated that over-ordering behavior is influenced by three main aspects: deliberate processes, habits, and situational influences. A combination of habitual intentions and service interventions explains over-ordering behavior.

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3. Conceptual Framework

Based on the literature review, the hypotheses suggest that attitude, subjective norm, and perceived behavior control influence the intention to use online food delivery services. Additionally, sales promotions and leftover reuse are expected to affect both the intentions to use and over-ordering. These factors serve as external variables beyond the core constructs of the Theory of Planned Behavior (TPB). Previous studies indicate that these two variables relate to both the intention to use online food delivery services and the tendency to over-order. Prasetyo et al. (2021) found that promotions in food delivery services influence individuals' decisions to use the service, so increasing their likelihood of using the service, with promotions serving as an effective incentive. Similarly, Hasbi et al. (2022) noted that promotions and discounts are key drivers for individuals ordering food through online delivery platforms. These sales promotions, especially large discounts, not only attract consumers but also lead to increased impulsive purchases. Food waste is the largest waste type in Indonesia, posing significant environmental, social, and economic challenges. A common solution among households is to reuse leftover food for later consumption. Shankar et al. (2022) found that consumers are often motivated by the habit of reusing food when ordering, as it is more convenient and cost-effective than dining at restaurants. Additionally, Shankar et al. (2022) noted that consumers who use online food delivery services may find it easier to manage leftover food due to the routine of reusing it, which in turn leads to a tendency to over-ordering. Figure 1 illustrates the conceptual framework for this study.

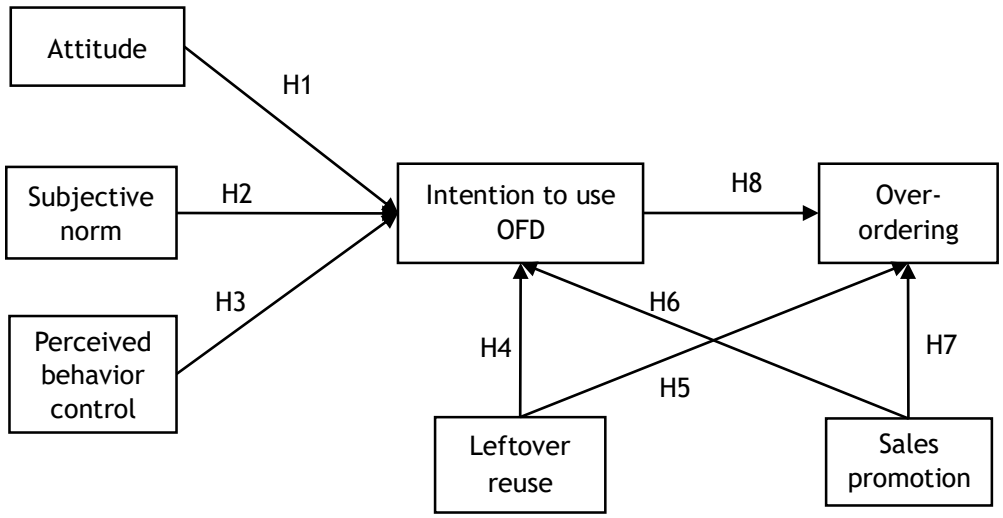

Figure 1. Conceptual framework intention to use and over-ordering in online food delivery services: an extension of the theory of planned behavior

From Figure 1, the resulting hypotheses are as follows:
H1: Attitude affects intention to use OFD
H2: Subjective norm affects intention to use OFD
H3: Perceived behavior control affects intention to use OFD
H4: Leftover reuse affects intention to use OFD
H5: Leftover reuse affects over-ordering
H6: Sales promotion affects intention to use OFD
H7: Sales promotion affects over-ordering
H8: Intention to use affects over-ordering

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4. Methods

4.1 Research Design

This study employed a cross-sectional approach to investigate quantitative descriptions. Online food delivery services in Indonesia have expanded to various regions, particularly in major cities. The three most popular services are GoFood, GrabFood, and ShopeeFood. According to their respective websites, GoFood operates in 74 cities, while GrabFood operates in 178 cities. This research was conducted in Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek), selected as the initial markets for online food delivery service users. Data collection and processing took place from October to December 2023. The research utilized both primary and secondary data. Primary data were obtained through an online questionnaire distributed via Google Forms. Secondary data were sourced from various literature, including journals, theses, books, and research institutions related to the study.

The questionnaire was distributed online via Google Forms, allowing respondents to complete the questionnaire using the provided link. It consisted of five sections: researcher introduction, screening, respondent identity, utilization of online food delivery services, and questions about intention to use and over-ordering. Each question included predetermined response options provided by the researcher though some allowed for open-ended responses. The screening section verified respondent eligibility, such as residing in the Jabodetabek region. The respondent identity section collected demographic data, including name, gender, occupation, marital status, age, monthly food expenditure, and income. The utilization of online food delivery services section explored the frequency of use, preferred services, types of food ordered, reasons for ordering, order locations, and intended recipients of food orders. The final section assessed the intention to use and over-ordering using a 5-point Likert scale and included statements related to each variable under investigation.

4.2 Sampling

Sampling was conducted using a non-probability sample technique, which provides unequal opportunities for each member of the population to be included in the sample. The specific method employed was purposive sampling, which involves selecting samples based on predefined criteria relevant to this study. The questionnaires were distributed in the Greater Jakarta area (Jabodetabek) to individuals who have ordered food through online food delivery services. The criteria for selection included individuals aged 17 years and older, residing in Jabodetabek, and having used online food delivery services, specifically GoFood, GrabFood, or ShopeeFood. According to Hair et al. (2019)The sample size is determined using SEM by multiplying the number of latent variable indicators by a parameter, typically 5 to 10. Also, caution that considerable sample size can lead to excessive sensitivity in statistical significance. This study's initial sample size was 125 individuals, but it ultimately gathered responses from 253 participants.

4.3 Measurement

The study employs Likert scale weighting to collect data, ranging from a score of 1 (strongly disagree) to 5 (strongly agree). The research comprises seven variables with a total 25 indicators: attitude consisting of 3 indicators (Sharma et al., 2021; Stancu et al., 2016), subjective norm consisting of 3 indicators (Lee, 2009; Troise et al., 2021), perceived behavior control consisting of 3 indicators (Stefan et al., 2013; Talwar et al., 2022), leftover reuse

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consisting of 5 indicators (Shankar et al., 2022; Stancu et al., 2016; Talwar et al., 2022), sales promotion consisting of 4 indicators (Prasetyo et al., 2021), intention to use consisting of 3 indicators (Ray et al., 2019; Shankar et al., 2022), and over-ordering consisting of 4 indicators (Stancu et al., 2016; Stefan et al., 2013; Talwar et al., 2022). Table 1 presents the research instruments.

Table 1. Research instruments intention to use and over-ordering in online food delivery services: an extension of the theory of planned behavior

Variables	Operational definition	Indicators
Attitude	An individual's strong belief in the value of engaging in or refraining from a particular behavior.	1) Ordering food through OFD (Online Food Delivery) services is good (A1). 2) Using OFD is wise because it simplifies food ordering (A2). 3) Ordering food via OFD is a satisfying experience for me (A3).
Subjective norm	Perceived social pressure to engage in or refrain from a behavior	1) Many people around me use OFD, so I also participate in using it (SN1). 2) People around me believe ordering food through OFD is better than going directly to a restaurant (SN2). 3) Opinions from those around me regarding OFD food orders are crucial to me (SN3).
Perceived behavior control	Consumers' perception that they have the knowledge and resources needed to perform a particular task	1) It is effortless to order food through OFD (PBC1) 2) I can easily place an order on an OFD platform if I want to (PBC3). 3) I have ample time to order food through OFD (PBC3).
Leftover reuse	Methods employed by an individual to reuse and store leftover food	1) I consume leftovers from my food orders (LR1). 2) I reheat leftover food when needed (LR2). 3) I maximize the use of leftover food from my orders (LR4). 4) I store leftovers properly to make them last longer (LR5). 5) I transform leftovers into different dishes by adding ingredients before eating (LR3).

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Table 1. Research instruments intention to use and over-ordering in online food delivery services: an extension of the theory of planned behavior (Continue)

Variable	Operational definition	Indicator
Sales promotion	Pricing strategies designed to create impulsive purchases to boost product sales	1) Sales promotions (discounts) encourage me to use OFD services (SP1). 2) Promotions often lead me to purchase more than I need (SP2). 3) Using OFD allows me to take advantage of promotional offers (discounts) (SP3). 4) I consider the terms and conditions of promotions important before using OFD services and over-ordering (SP4).
Intention to use	Consumers' positive intention towards using online food delivery services	1) I plan to order food through OFD in three days (IU1). 2) I will consistently use OFD for food purchases (IU2). 3) I intend to use OFD more frequently in the future (IU3).
Over-ordering	Consumers who buy more food than needed	1) I often buy more food than necessary through OFD (OO1). 2) Sometimes, I order too much food without thinking it through (OO2). 3) I buy extra food because of the variety available (OO3). 4) I usually buy more food than needed because I intend to consume it later (OO4).

4.4 Data Collection

This research uses a structured questionnaire to collect primary data from an online survey. The questionnaire includes written questions designed to elicit accurate responses, with respondents asked to select one answer for each question. Data collection was conducted using the internet, specifically through a Google Form. To complete, the participants must be aged 17 or older, reside in the Jabodetabek area, and have used OFD services such as GoFood, GrabFood, and Shopee Food. The questionnaire was distributed via Google Forms and social media platforms like Instagram and WhatsApp.

4.5 Data Analysis

At this stage, the data collected through the research process is analyzed using descriptive analysis and structural equation modeling. Descriptive analysis is employed to describe the responses gathered in this study systematically. It helps identify patterns in the data that address the research questions posed and serves as a data simplification tool (Loeb et al.,

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2017). This involves examining current data related to the research to help achieve the research objectives. In this study, descriptive analysis is utilized to describe the characteristics of respondents and the use of OFD services.

To investigate the factors influencing the usage of online food delivery (OFD) service and over-ordering behavior, this study employs structural equation modeling (SEM). The Partial Least Squares (PLS-SEM) method is utilized to analyze the data, systematically evaluating both the measurement model and the structural model (Hair et al., 2019). This study adopts a reflective measurement model. According to Hair et al. (2017), Cronbach's alpha values greater than or equal to 0.8 indicate a reasonable scale, greater than or equal to 0.7 for an acceptable scale, and greater than or equal to 0.6 for exploratory purposes. For composite reliability, values between 0.6 and 0.7 are acceptable for exploratory research, while values between 0.7 and 0.9 are deemed suitable for more advanced research. For convergent validity, factor loadings exceeding 0.7 are recommended. Additionally, the average variance extracted should be greater than 0.5. This study adopts an exploratory research design. As noted in the previous paragraph, the evaluation of the inner model predicts the causal relationships between variables. The R-squared value is a crucial metric for measuring the proportion of variance explained by the inner model.

5. Findings

5.1 Respondent Characteristics

According to the consumer demographics in Table 2, Bogor has the highest percentage of residents compared to the other four cities. Jakarta is the second most common city of residence. Most online food delivery service users are female, aged 25 to 35, singles, and hold a bachelor's degree (S1/D4). Respondents are primarily private sector employees and report monthly food expenditures ranging from IDR1,000,000 to IDR2,000,000. This indicates that the respondents are employed and have the independence to use their earned income.

Table 2. Characteristics of respondents

Characteristics	Category	Frequency (n)	Percentage (%)
Residence	Jakarta	80	32
	Bogor	93	37
	Depok	29	11
	Tangerang	21	8
	Bekasi	30	12
Gender	Male	55	22
	Female	198	78
Age	16-19	2	1
	19-24	46	18
	25-35 yo	189	75
	36-50 yo	13	5
	51-65 yo	3	1
Marital Status	Single	166	66
	Married	85	34
	Widower	1	0
	Widow	1	0

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Table 2. Characteristics of respondents (Continue)

Characteristics	Category	Frequency (n)	Percentage (%)
Education	High School (SMA/SMK/equivalent)	21	8
	Associate degree (D3)	25	10
	Bachelor's degree (S1/D4)	185	73
	Master's degree (S2)	22	9
Occupation	Not Employed	7	3
	Intern	3	1
	Housewife	11	4
	Student	28	11
	Government Employee	12	5
	Civil Servant (PNS)	11	4
	Teacher	5	2
	Private Sector Employee	156	62
	Entrepreneur	14	6
	Other	6	2
Income	< IDR1,500,000	23	9
	IDR1,500,000 – IDR3,000,000	19	8
	IDR3,000,000 – IDR5,000,000	57	23
	IDR5,000,000 – IDR10,000,000	118	47
	> IDR10,000,000	36	14
Monthly Food Expenditure	< IDR500,000	21	8
	IDR500,000 – IDR1,000,000	63	25
	IDR1,000,000 – IDR2,000,000	95	38
	> IDR2,000,000	74	29

5.2 Use of OFD Services

Table 3 presents the most significant usage percentage of OFD services in this study. The most common ordering frequency is rarely (1-2 times per week).

Table 3. Online food delivery service users

Use of OFD Services	Category	Frequency (n)	Percentage (%)
Frequency of Use	Rarely (1-2 times per week)	131	52
Service Used	GoFood	109	43
Food Ordered	Chicken, beef, and its derivatives	194	77
Reasons for Using the Service	Ease of use	200	79
	Promotion (discount) offered	180	71
Spending per Order	IDR 50,000 – IDR100,000	163	64
Ordersing Location	Home	189	75
For Whom the Food is Ordered	For oneself	155	61

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Among the services, Go Food is the preferred choice for respondents when purchasing food online, with chicken, beef, and its derivatives being the most frequently ordered types of food. Respondents prefer OFD services for their convenience and promotional offers. Respondents spend between IDR50,000 and IDR100,000 per meal, as OFD services often have a minimum purchase requirement. Most respondents order food primarily for themselves at home.

5.3 Model Evaluation

Table 4 presents the factor loading results and AVE for each variable. According to Hair et al. (2019), factor loading values should exceed 0.7, while AVE values must be at least 0.5. In this study, three indicators did not meet the factor loading criteria and were subsequently removed. The indicators LR1, LR4, and SP1 were removed due to their failure to meet the factor loading requirement. Following this removal, the analysis was recalculated with 22 valid indicators. Furthermore, each variable satisfied the AVE criterion as it exceeded 0.5.

Table 4. The value of factor loadings, mean, standard deviation, Cronbach's alpha, CR, AVE, and r-square value in the research

Variables and indicator	Factor loading	Mean	Standard deviation	Cronbach's alpha	CR	AVE	R-Square	Adjusted R Square
Attitude				0.860	0.864	0.781		
A1	0.896	4.217	0.778					
A2	0.878	4.233	0.752					
A3	0.878	3.901	0.831					
Subjective norm				0.740	0.745	0.657		
SN1	0.789	3.269	1.117					
SN2	0.808	3.111	1.019					
SN3	0.834	3.067	1.156					
Perceived behavior control				0.857	0.862	0.778		
PBC1	0.878	4.431	0.711					
PBC2	0.918	4.356	0.800					
PBC3	0.849	3.921	0.967					
Leftover reuse				0.735	0.796	0.625		
LR2	0.762	3.474	1.109					
LR3	0.839	2.308	1.096					
LR5	0.769	3.534	1.087					
Sales promotion				0.709	0.818	0.613		
SP2	0.867	3.731	1.074					
SP3	0.754	4.158	0.699					
SP4	0.719	4.095	0.875					
Intention to use				0.857	0.861	0.777	0.336	0.323
IU1	0.851	3.190	1.130					
IU2	0.915	3.028	1.105					
IU3	0.879	2.996	1.035					
Over-ordering				0.874	0.888	0.730	0.350	0.343
OO1	0.886	2.601	1.210					
OO2	0.900	2.237	1.138					
OO3	0.900	2.478	1.178					
OO4	0.719	2.549	1.204					

Discriminant validity is assessed through cross-loading, which occurs when the correlation between indicators of a construct exceeds the correlations with other constructs. Cross-loading values indicate the correlation levels between each indicator and its related construct compared to other constructs. Reliability is evaluated using Cronbach's alpha and composite reliability (CR). In this study, Cronbach's alpha and composite reliability for each variable were above 0.7 (Hair et al., 2019). This indicates that the measurement instruments

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(CA and CR) are robust, providing a reliable evaluation of the intended constructs. Based on the convergent validity, discriminant validity, and reliability from the outer model, the developed model demonstrates valid and reliable findings.

Based on Table 4, the present study investigates seven variables characterized by distinct mean values across various indicators. The attitude variable, consisting of three indicators, suggests that respondents generally favor online food delivery services for ordering food. However, a slight disparity is observed in their satisfaction levels concerning the ease and discretion of using these services. The subjective norm variable with three indicators indicates that social influence substantially motivates respondents to utilize online food delivery services. Similarly, the perceived behavioral control variable, featuring three indicators, reveals that respondents generally find online food delivery services highly convenient, promoting their adoption.

The leftover reuse variable, assessed through three indicators, demonstrates that respondents tend to reheat and store leftovers but are less likely to repurpose them into different dishes. The three indicators of sales promotion indicate respondents' general approval of sales promotions offered by online food delivery services, increasing the likelihood of utilizing these promotions while ordering food. Moreover, these promotions can incentivize respondents to make larger purchases due to minimum purchase requirements. Based on its mean values, the intention to use a variable indicates that respondents are likely to continue using online food delivery services, maintain consistent usage, and potentially increase order frequency. Finally, the over-ordering variable reveals that respondents generally avoid excessive ordering, likely due to being mindful of portion control and an effort to prevent overconsumption.

According to Table 4, the variable intention to use has an R-square value of 0.336, which means that the variation explained by the variables attitude, subjective norm, perceived behavioral control, leftover reuse, and sales promotion is 33.6%. In contrast, 66.4% is explained by variables outside the proposed model. The variable over-ordering has an R-square value of 0.350, which means that intention to use, leftover reuse, and sales promotion can explain 35% of the variation in over-ordering, with the remaining 65% explained by factors outside the proposed model.

The hypotheses presented earlier can be tested by bootstrapping on the path coefficient findings from Smart-PLS. As shown in Table 5 and Figure 2, there is evidence of a direct effect of endogenous variables on exogenous variables. However, the four relationships have p-values greater than 0.05, indicating no significant influence of the endogenous variables on the exogenous variables. The remaining four relationships were supported, with p-values less than 0.05. Specifically, attitude positively influences intention to use (p-value = 0.000 < 0.05), subjective norm positively influences intention to use (p-value = 0.000 < 0.05), sales promotion positively influences over-ordering (p-value = 0.000 < 0.05), and intention to use positively influences over-ordering (p-value = 0.000 < 0.05).

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Table 5. Path coefficients values

Variables	Original sample	t-stat	p-value	Conclusion
Attitude → Intention to use	0.407	5.336	0.000**	Supported
Subjective norm → Intention to use	0.276	4.510	0.000**	Supported
Sales promotion → Over-ordering	0.302	5.314	0.000**	Supported
Intention to use → Over-ordering	0.407	7.120	0.000**	Supported
Perceived behavioral control → Intention to use	-0.048	0.710	0.478	Not Supported
Leftover reuse → Intention to use	-0.030	0.371	0.711	Not Supported
Leftover reuse → Over-ordering	0.104	1.401	0.161	Not Supported
Sales promotion → Intention to use	0.050	0.824	0.410	Not Supported

Note: ** The coefficient is statistically significant at p<0.05

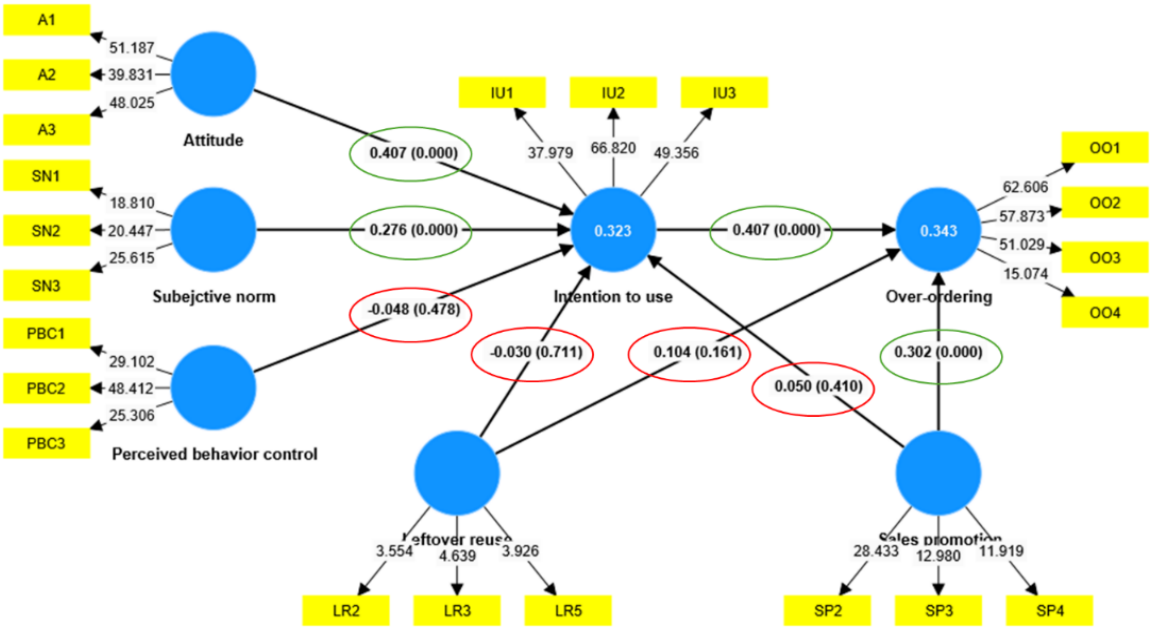

Figure 2. Results of bootstrapping test of research intention to use and over-ordering in online food delivery services: an extension of the Theory of Planned Behavior

6. Discussion

6.1 The Effect of Attitude on Intention to Use Online Food Delivery Services

The first hypothesis is supported, showing a significant positive impact of attitude on intention to use. This is because consumers tend to have a positive attitude towards online food delivery services and view purchasing through these services as an effective and efficient method. This aligns with prior research stating that consumers find ordering food through this service satisfying, enjoyable, and practical, reinforcing a strong intention to use them in the future (Shankar et al. 2022). Consumers develop a positive attitude due to their satisfaction and favorable experiences, increasing the likelihood of using them (Inthong et

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al., 2022). Factor such as convenience, time-saving, order accuracy, and high service quality contribute to this positive attitude. Satisfactory and enjoyable experiences with online food delivery services indicate a solid intention to use them soon, thereby fostering a positive consumer attitude towards their use.

6.2 The Effect of Subjective Norms on Intention to Use Online Food Delivery Services

The significant influence of subjective norms on the intention to use online food delivery services supports the hypothesis. This indicates that social pressure encourages consumers to adopt these services. Advertisements or recommendations and close contacts often spark consumers' interest in placing an order (Inthong et al., 2022). Support from people who view online food delivery services as a good choice, provides validation and increases consumers' confidence in their decision to use the services. This social pressure aligns with lifestyle conformity (Roh & Park, 2019), often leading individuals to adopt the opinions and behaviors of others.

6.3 The Effect of Sales Promotion on Over-Ordering

The relationship between sales promotion and over-ordering is significant, confirming the hypothesis. These findings indicate that sales incentivize consumers to order more food. Over-ordering is driven by promotions or discounts with minimum purchase requirements. Online food delivery services offer discount coupons and free delivery, enhancing consumers' perceived value of the products compared to situations without such promotions (Prasetyo et al., 2021). Additionally, it shows that consumers consider terms and conditions such as minimum purchase requirements, discount percentages, and expiration dates before placing an order. Aryanti and Andarini (2023) stated that sales promotions significantly impact excessive purchases in OFD services, such as GoFood. These promotions effectively attract customers' interest in purchasing products through OFD platforms. Research by Hasbi et al. (2022) concluded that discount programs significantly influence purchase frequency and can encourage impulsive buying behavior.

6.4 The Effect of Intention to Use on Over-Ordering

The intention to use significantly impacts over-ordering, confirming the hypothesis. This finding is supported by Shankar et al. (2022), who indicate that consumers who intend to use food delivery services soon tend to purchase more food than those who buy food for immediate consumption. This can lead to over-ordering, especially when combined with attractive sales promotions. This aligns with the previous statement, which claims that sales promotions influence over-ordering. Promotions such as significant discounts or special offers motivate consumers to buy more food than necessary, as they aim to maximize the benefits of these promotions. Therefore, a strong intention to consistently use online food delivery services can contribute to the habit of over-ordering in response to appealing sales promotions.

6.5 The Effect of Perceived Behavioral Control on Intention to Use Online Food Delivery Services

The relationship between perceived behavioral control and the intention to use online food delivery services is insignificant, and the hypothesis is not accepted. These results indicate that using mobile technology has become common and integral to daily life, so there is no

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need to consider whether they can use it, as they are already familiar and comfortable with the technology. This aligns with research by Shankar et al. (2022), which suggests that consumers use this technology instinctively, meaning they do not need to consciously think about their ability to control online food delivery services. Based on the distribution of consumer characteristics in this study, most respondents are 22 to 44 years old and already familiar with the Internet and OFD services, making it easier for them to use them. Research from Belanche et al. (2020) suggests that younger consumers' decisions about food delivery services are not influenced by the perception that the individual controls the app. In contrast, older consumers need more confidence in operating technology such as these services.

6.6 The Effect of Leftover Reuse on Intention to Use Online Food Delivery Services

The relationship between leftover reuse and the intention to use online food delivery services is insignificant therefore the hypothesis is not accepted. This result aligns with Shankar et al. (2022) who state that leftover reuse is unrelated to the intention to use online food delivery services because consumers do not believe that using online food delivery services results in food waste. Consumers remain using online food delivery services to order food regardless of whether they intend to reuse leftovers. This indicates that the intention to reuse leftover food is independent of consumers' decisions to order food through online food delivery services.

6.7 The Effect of Leftover Reuse on Over-Ordering

The influence of leftover reuse on over-ordering is insignificant, therefore the hypothesis is not accepted. This is evident from the questionnaire responses, in which the item with the most significant factor loading, LR3, states, "turning leftovers into different dishes by adding some ingredients before eating," the spread of responses showed disagreement. Consumers who order food already know the portions they are ordering. Even if consumers order food to be consumed later or reused, it does not lead them to order food excessively. This contrasts with the research by Talwar et al. (2022) and Shankar et al. (2022), in which leftover reuse significantly impacts the intention to use, as consumers are accustomed to reusing leftovers to save time.

6.8 The Effect of Sales Promotion on Intention to Use Online Food Delivery Services

The influence of sales promotion on the intention to use online food delivery services is insignificant, therefore the hypothesis is not accepted. This statement aligns with Widanengsih et al. (2022), which indicates that the costs associated with online food delivery services have been increased so that consumers still pay a substantial amount, even with sales promotions or discounts. Consumers already familiar with and comfortable with OFD services will continue using them without additional incentives such as discounts. Therefore, factors beyond sales promotions are required to drive the intention to use online food delivery services. Additionally, consumers prioritize consistent and reliable service over the discounts offered.

6.9 Managerial Implication

Based on these findings, the managerial implications of this study are as follows: positive consumer attitudes towards continuous use of online food delivery services can be fostered

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through advertising. This approach can enhance the visibility of online food delivery brands among the public. OFD services should harness social influence by enhancing promotional strategies that incorporate user reviews and collaborations with influencers who shape public perception. Additionally, online food delivery offers features to help user manage their consumption behavior, such as setting order reminders, providing nutritional information, recommending portion sizes tailored to individual needs, and displaying the amounts of food ordered to encourage mindful purchasing decisions. Furthermore, online food delivery services can provide information about the consequences of excessive purchases that may lead to food waste. Additionally, providing food labels that indicate when the food was prepared and how long it will last at room temperature can further assist consumers. Online food delivery services have the potential to mitigate food waste by enhancing consumer awareness through educational initiatives, in-app information dissemination, and the features designed to encourage demand-driven ordering. For instance, creating videos demonstrating effective leftover utilization could be a valuable strategy.

6.10 Theoretical Contribution

This study provides a theoretical contribution in two ways. First, it employs the Theory of Planned Behavior, comprising attitude, subjective norm, and perceived behavioral control, to predict intention and subsequent behavior. The findings reveal that individual's intention to use online food delivery services is influenced by their personal attitudes and external pressures from others. These findings indicate that perceived behavioral control does not affect reuse intention, aligning with previous research. Second, the study highlights two additional variables, sales promotion, and leftover reuse, that are relevant to online food delivery services. The intention to use the service affects over-ordering, particularly when combined with promotions. Unlike previous studies that found that leftover reuse influences over-ordering, this study finds that leftover reuse does not impact the intention to use online food delivery services or over-ordering. This suggests that consumers believe engaging in leftover reuse does not diminish their intention to utilize online food delivery services and does not lead to over-ordering.

6.11 Limitations

The limitations of this study are related to the r-square value falling into the low category, indicating that there are still many variables that could better describe the intention to use online food delivery services, such as trust levels, respondent experiences, and lifestyle factors. Online food delivery services include Go Food, Grab Food, and ShopeeFood, and questionnaire distribution was only conducted in the Jabodetabek area and did not differentiate by age and generation. There are limitations due to the distribution of the questionnaire not being widespread, which resulted in respondents not being distributed evenly across all regions.

7. Conclusions

Based on the results of the descriptive analysis, the consumer characteristics are women aged 25 to 35, single, employed in the private sector, and having a bachelor’s degree (S1/D4). Additionally, respondents spend between IDR1,000,000 and IDR2,000,000 on food in a month. Most respondents use online food delivery services to buy food primarily due to the convenience and promotions provided, with Go Food being the most frequently used service and respondents spending ranging from IDR50,000 to IDR100,000 per meal because OFD

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services often have a minimum purchase requirement. The analysis of the effects reveals that four hypotheses are accepted: attitude impacts the intention to use online food delivery services, subjective norm impacts the intention to use online food delivery services, sales promotion impacts over-ordering, and intention to use impacts over-ordering. Attitude is a substantial variable affecting the intention to use online food delivery services, with convenience and a positive experience being reasons for consumers to use these services. The intention to use is a substantial variable influencing over-ordering when combined with sales promotion. The managerial implications of this study are aimed at online food delivery services and include implementing food labeling, leveraging influencer collaborations to attract consumers, providing features that help manage consumption behavior, and offering educational videos on leftover reused food.

8. Recommendation

Considering the research limitations, future studies should add other exogenous variables beyond this study to better explain the intention to use online food delivery services and over-ordering. Suggested variables include trust levels, respondent experiences, and lifestyle factors. This research focused exclusively on the Jabodetabek area; therefore, future studies should explore a broader geographic scope and differentiate consumers by generation. Additionally, further investigation into the insignificant relationship between leftover reuse and over-ordering can be conducted, for example, by adding another statement or considering the issue from an opposite perspective.

Citation information
Cite this article as: Permasih, D., Suroso, A. I., & Hasanah, N. (2024). Intention to use and over-ordering in online food delivery services: an extension of the Theory of Planned Behaviour. *Journal of Consumer Sciences, 9*(3), 315-337. https://doi.org/10.29244/jcs.9.3.315-337

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