

Examining consumer complaints from an on-demand service platform<sup>☆</sup>Nina Yan<sup>a</sup>, Xun Xu<sup>b</sup>, Tingting Tong<sup>c,\*</sup>, Liujia Huang<sup>a</sup><sup>a</sup> Business School, Central University of Finance and Economics, 39 South College Road, Haidian District, Beijing, 100081, PR China<sup>b</sup> Department of Management, Operations, and Marketing, College of Business Administration, California State University, Stanislaus, One University Circle, Turlock, CA, 95382, United States<sup>c</sup> International Business College & Institute of Supply Chain Analytics, Dongbei University of Finance and Economics, 217 Jianshan Street, Dalian, 116025, PR China

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## ABSTRACT

Service platforms have rapid development in the online-to-offline new retail era. Although service platforms provide shopping convenience to consumers, they also face many challenges caused by the lack of regulations and relatively immature and unstandardized operations compared with traditional commercial markets. The downsides of service platform operations thus lead to consumer complaints. Using empirical evidence from an on-demand service platform (i.e., Meituan), we examined the different determinants of consumer complaints about the platform and merchants. We found that not all individual attributes or overall performance indicators of consumer dissatisfaction lead to complaints. Consumers can have the appropriate attribution of complaints about merchants or platforms when they encounter product or service failures, which we refer to as the self-influence effect of consumer complaints. In addition, we found the spillover effect of consumer complaints. Consumers do not always exactly match the objects being complained about. They attribute product or service failures by merchants to not only merchants themselves but also the platform, and thus complain about both. Consumers also complain about merchants when failures come from the platform's delivery service. Further, we found that the merchants' property of belonging to a large chain has the significant self-influence effect and spillover effect on consumer complaints. This study offers guidelines for merchants and service platforms to set priorities for improving factors that lead to consumer complaints and suggests ways to achieve better performance and reduce complaints about both the merchants and platforms.

## 1. Introduction

Taking the advantage of information technology and higher popularity of Internet users, service platforms have emerged and rapidly developed during the last decade worldwide (Wu et al., 2020). Particularly, in the last decade, the on-demand economy has experienced rapid growth and accumulated a large consumer base (Zhong et al., 2019). Typical examples from all over the world are in the contexts of riding such as Uber in the United States, Didi in China, and Ola in India; and food delivery such as Eleme, Jingdong to Home, Koubei, and Meituan in China; Deliveryhero in Germany; Deliveroo and Just Eat in the United Kingdom; and DoorDash, Grubhub, and Uber Eats in the United States (Tong et al., 2020). The on-demand economy is supported by online platforms that match consumers' demands with service offerings immediately upon receiving the order instead of making the consumers

make reservations in advance (Taylor, 2018). This encourages service platforms to provide rapid responses to consumer demands and optimize their unique operations by taking into account the features of the on-demand economy (Guda and Subramanian, 2017).

Armed with the online-to-offline business model, service platforms have brought significant advantages to consumers such as unique shopping experience, convenience, and more service options in the new retail era (Wan et al., 2020). However, service platforms are still facing numerous challenges today (Choi et al., 2020). Due to the high supply and demand uncertainty, they need to dynamically adjust the capacity to balance supply and demand (Tong et al., 2020). In addition, the operations are more vulnerable due to the high level of uniqueness and variety of service and the need of intensive collaboration among various service providers (Cenamor et al., 2017). Further, lack of regulation and efficient communication between various participants is another

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challenge for the further development of service platforms (Choi et al., 2020). Therefore, the operations processes of service platforms, especially in the on-demand context, are still immature and underexplored given rapid expansion and market permeation. This is leading to consumer complaints, as an expression of consumers' dissatisfaction (Gurvich et al., 2019).

Consumer complaints result in many negative consequences, including consumers' leaving and switching behaviors, negative word-of-mouth effects encouraging other consumers to leave, damage to firms' reputation and image, and creation of public crises for firms. All of these in turn significantly reduce firms' demand and worsen their financial performance (Ni et al., 2014). Efficient implementation of complaint management serves as an important recovery action to ensure consumer retention and mitigate the negative consequences of complaints after service failures (Galitsky et al., 2009). The first step of complaint management is to understand consumer needs and complaint behaviors (Coussement & Van den Poel, 2008), which is the focus of this study.

Although complaint-related studies have been conducted for years, we differentiate our study from previous research through the following three aspects. First, many previous studies (e.g., Lapré and Tsikriktsis, 2006; Tsikriktsis and Heineke, 2004) did not differentiate between the determinants of consumer dissatisfaction and complaints. They assume the poor performance of firms leads to consumer dissatisfaction and complaints together. However, in essence, consumer dissatisfaction is a negative perception, whereas complaints are the action that results from this negative perception (Singh, 1988). This study examines the determinants of consumer complaints and explores whether all aspects of poor performance and consumer dissatisfaction trigger complaints.

Second, most previous research on consumer complaints (e.g., Raval, 2020) assumed that the product or service provider that consumers complained about is the party with product or service failure; namely, the reason and object of the complaint are the same. However, consumer complaint is a complex behavior determined by various factors including cognition such as evaluation and affection such as emotion (Velázquez et al., 2009). When product or service failures occur, consumers may correctly attribute their source and vent their anger in a targeted way or experience cognitive bias to transfer their anger and vent it on the party that is not to blame (Donoghue and de Klerk, 2013). The mechanism of consumer complaints is still a black box underexplored in terms of the connection between the reasons and objects of the complaints. To fill in this research gap, this study bridges these two fields by analyzing why consumers complain and discussing whom they complain about.

Third, most of consumer complaint studies (e.g., Johnen and Schnittka, 2019; Raval, 2020) discuss complaint management issues in general retail or service industry contexts. Very few, if any, focus on complaints in the on-demand economy. Our empirical evidence comes from Meituan, an on-demand food delivery platform that is among the top-ten venture-backed private companies with the highest values around the world, according to the *Wall Street Journal* (Chen et al., 2020). Numerous merchants, the majority of which are restaurants, are listed on Meituan.com. As an intermediary platform, Meituan plays an intermediary role in reaching consumers and offering food delivery service. Meituan allows consumers to make complaints either about the platform or merchants, through phone calls. We analyze these complaints in this study.

The objective of this study is to examine the mechanism of consumer complaints to connect the reasons (i.e., the determinants of complaints) and objects (i.e., platform or merchants). Accordingly, we raise three research questions. First, what are the determinants of consumer complaints about the platform and merchants, respectively? Specifically, do all individual attributes or overall performance indicators consumers are dissatisfied with lead to their complaints? Through these questions, we examine the reasons for consumer complaints. Second, do consumers attribute product or service failures to the source or do they also blame

other parties? By answering this question, we examine the connections between the reasons and objects consumers complain about. Furthermore, consumers may have different perceptions of merchants that are in a larger chain, a chain that contains a higher number of merchants. A larger chain often has a higher brand effect. In addition, consumers may observe more standardized operations across merchants in a larger chain, such as the same menus, prices, and food package offerings (Harris et al., 2014; Mallapragada and Srinivasan, 2017). Thus, it is easier for consumers to compare merchants in a larger chain, which affect their feelings and judgments of these merchants (Xu, 2019) and thus may influence their complaint behavior. This leads to our third research question: How does a merchant's belonging to a large chain affect consumer complaints about the merchant and the platform?

The contributions of this study mainly lie in the following aspects. First, this study found the determinants of consumer complaints about the service platform and merchants and differentiates the factors arousing consumer dissatisfaction and triggering complaints. Second, this study examines the connections and differentiations of the reasons consumers complain and the objects they complain about. We examine the self-influence effect of consumer complaints, namely, when consumers complain about the providers who actually cause the product or service failure, and the spillover effect of consumer complaints, namely, when consumers transfer their anger and complain about the other party. Third, this is one of the first studies analyzing consumer complaints in the on-demand service platform context. Understanding the reasons, objects, and corresponding mechanisms of consumer complaints can help service platforms and their listed merchants understand consumers' needs and wants. In this way, the platforms and merchants can more effectively improve particular aspects of product or service performance to alleviate complaints and enhance consumer satisfaction. They can thus enhance their reputations and achieve better financial performance through cost savings arising from complaint management and increased revenue from more demand (Yilmaz et al., 2016).

The rest of the study is organized as follows. In section two, we describe the theoretical background of the study and review the relevant literature about consumer complaints. Section three contains the hypotheses. In section four, we analyze the data and present the results. In section five, we discuss the results, and we give the theoretical and managerial implications in section six. In section seven, we conclude the study and propose future research directions.

## 2. Literature review and theoretical background

### 2.1. Consumer complaints

Previous studies about consumer complaints can be categorized into two types. One group of research discusses the reasons and trigger mechanisms of complaints, and the other group discusses the consequences of complaints and service recovery strategies to handle complaints.

Regarding the first category of studies that discuss the reasons and trigger mechanisms of complaints, most researchers acknowledge that dissatisfaction is the antecedent of consumer complaints. According to the expectation-disconfirmation model, whether a consumer is satisfied or dissatisfied depends on the comparison between their expectation and perceived quality (Oliver, 1980). Consumer dissatisfaction occurs if the perceived quality of consumption is less than the pre-consumption expectations (Nam et al., 2020). However, dissatisfaction does not necessarily trigger complaints. Consumers will not complain if they do not want to take any action when dissatisfied or only want to take private actions such as warn relatives and friends. Only when consumers want to take actions will they consider complaining (Singh, 1988). Blodgett and Anderson (2000) found that consumers' attitude toward complaining affects their complaint behavior. If a consumer is assertive and wants to seek redress whenever he or she is dissatisfied about the product or service, the consumer will have more complaint behavior. Otherwise,

the consumer will be reluctant to complain even though he or she is dissatisfied. Additionally, complaint behavior can be influenced by consumers' culture and demographic information. Ngai et al. (2007) found that elder people tend to complain more, but consumers with a higher level of education and Asian consumers tend to complain less and take private actions for fear of "losing face." Moreover, intention is a critical determinant for complaint. Raval (2020) found that various consumers have different intentions to complain. Consumers in non-minority areas are more likely to complain compared with those in heavy-minority areas because of low levels of trust or general social capital. Miquel-Romero et al. (2020) focused on complaints from omni-channel consumers and found that their intention to seek redress and their assertiveness and high dissatisfaction lead to their complaint behavior. However, the channel of complaint, whether it is online or in a physical store, depends on a combination of situational, individual, or channel-related variables rather than the channel of purchase.

Regarding the second category of studies that focus on the consequences of complaints and service recovery strategies to handle complaints, previous research (e.g., Johnen and Schnittka, 2019) has found that consumer complaints lead to negative consequences, including reduced demand from consumers who complained and other consumers who heard of the complaints. Thus, many studies (e.g., Knox and Van Oest, 2014) have emphasized the importance of complaint management as a service or product failure recovery strategy. However, Knox and Van Oest (2014) found that although recovery actions can help consumer retention, they may still not totally offset the negative effect of complaints. Fornell and Wernerfelt (1987) claimed that complaint management can be considered as defensive marketing and that compensating the consumers who made the complaint—even higher than the marginal profits—is worthwhile. This is because defensive marketing can save the massive costs of offensive marketing, such as advertising and other types of promotion. Lapré and Tsikriktsis (2006) used data from consumer complaints about airlines to find that firms, depending on their organizational structures and properties, have different learning curves regarding handling consumer complaints. Hutzinger and Weitzl (2019) proposed a package of response actions to handle consumer online complaints, including promoting brand advocates, implementing defensive recovery actions, and encouraging other consumers' virtual presence.

Our study falls in the first category. Compared with studies that discuss complaint consequence and management, fewer studies focus on the reasons and trigger mechanisms of complaints. Although many studies (e.g., Zeelenberg and Pieters, 2004; Lapré, 2011) have discussed the reasons for consumer dissatisfaction, fewer studies have focused on the mechanisms for provoking complaints. In essence, dissatisfaction is a perception, but complaint is a behavior resulting from dissatisfaction. Thus, the antecedents of dissatisfaction do not necessarily lead to complaints. The consumer complaint mechanism is still unexplored in two aspects: (a) why consumers complain and (b) about whom consumers complain. Our study examines how the merchants' performance and property and platforms' performance trigger consumer complaints, either about the merchant or the platform.

## 2.2. Theoretical background

The theoretical background of this study mainly lies in two theories—attribution theory (Fiske and Taylor, 1991) and cognitive bias theory (Haselton et al., 2005). Attribution theory describes the mechanisms the individuals use information to arrive at causal explanations of events. It analyzes what information is collected and how it is combined to form a causal judgment (Fiske and Taylor, 1991). In this study, consumers seek the causes of the poor performance of a platform and merchants, including product, service, and overall performance. Then, they form judgments about whether the attribution is dispositional or situational. Consumers tend to complain more about dispositional attributions because those attributions are internal and can be largely

controlled by service providers, whereas situational attributes are external and are affected by many random natural factors (Jones and Davis, 1965). Consumers usually consider the quality of products or services to be the result of the intentional behavior of merchants or platforms (Kahn et al., 2002). Thus, when certain aspects of a platform and merchants have poor performance, consumers tend to complain about the poor performance of the corresponding provider. In this study, when consumers complain about the providers (i.e., the merchants or platform) who actually lead to the product or service failures, then the consumers have appropriate attribution. We claim these consumer complaints have a self-influence effect. Namely, the poor performance of providers triggers consumer complaints about those providers.

However, individuals can have cognitive bias, which is a systematic pattern of deviation from norm or rationality in judgment (Haselton et al., 2005). The causes of cognitive bias are individuals' subjective social reality and perception (Bless et al., 2004). Consumers' cognition alters or even generates bias when the circumstance changes (Zhu and Sarkis, 2016). Cognitive bias leads to irrationality, including perceptual distortion, illogical interpretation, and inaccurate judgment (Kahneman and Tversky, 1972). The cognitive bias may cause consumers to illogically interpret the causes of poor performance, triggering their irrational complaint behavior about inaccurate objects. In this study, we find that the poor performance of merchants may trigger consumer complaints about the platform, or the poor performance of the platform may trigger consumer complaints about the merchants. In this way, consumers transfer their anger caused by one party to the other party. We refer to this as the spillover effect of consumer complaints in this study. Further, the trigger mechanisms of consumer complaints can be different depending on the property of the merchant, which is also examined in this study.

## 3. Hypotheses development

### 3.1. Effect of merchants' performance on complaints about the merchants

Merchants' performance can be evaluated at both attribute and overall level (Mittal et al., 1998). Regarding the attribute level, product and service are the two most important attributes (Mayer et al., 2009). In this study, the merchants, that is, restaurants, offer products as food and services such as packaging. Consumers' purchase behavior is determined by their cost-benefit analysis. If the benefits are higher than the costs, then consumers are willing to purchase (Emerson, 1976). The benefits come from the high quality of the products and services offered by the merchants. In this study, food is the core product consumers purchase, and the service ensures food quality through, for example, packaging. When the performance of a product and service is low, the benefits cannot outweigh the costs, which lowers consumers' utility and stimulates their feelings of monetary loss (Ratchford, 1982). Thus, consumers tend to complain about merchants.

Regarding the overall level, merchants' performance can be measured by their positive and negative ratings and their popularity. A high positive rating ratio indicates that merchants have many occasions of performing well, which raises their image and reputation and lowers consumer complaints (Yoon et al., 1993). A low negative versus positive rating ratio (referred to herein as "negative-to-positive ratio") shows that merchants have fewer cases of bad performance compared with those of excellent performance, which makes consumers less likely to experience product or service failures and thus have a lower chance of complaining (Tax and Brown, 1998). High popularity, reflected by large sales in previous selling periods, provides a positive signal about the quality of products and services and the facts that more consumers are in favor of those products and services (Mittra and Fay, 2010). This reduces consumer complaints. Therefore, based on the above discussion, we hypothesize the following:

**H1.** Merchants' lower performance in individual attributes of product

and service, measured by a lower rating of taste (H1a) and a lower rating of packaging (H1b), respectively, increases consumer complaints about the merchants. Merchants' lower overall performance, measured by a lower positive rating ratio (H1c), a higher negative-to-positive ratio (H1d), and a lower popularity (H1e), increases consumer complaints about the merchants.

### 3.2. Effect of the Platform's performance on complaints about the platform

The platform in this study is the delivery service provider. One of the significant differences between online purchasing versus brick-and-mortar store shopping is the separation of payment and fulfillment processes (Bauer et al., 2006). The time between ordering something and receiving it can be viewed as lead time, which in this study is the delivery time for the food delivery industry (Weng and McClurg, 2003). Based on previous studies (e.g., Handfield and Pannesi, 1992), delivery performance can be measured by two dimensions: speed and reliability. Regarding speed, a longer delivery time makes consumers impatient about waiting (Shang and Liu, 2011). This increases the perceived risk, which leads to consumers' frustration and complaint behavior (Tronvoll, 2011). Regarding reliability, consumers expect delivery to be within the estimated time. A late delivery can disrupt consumers' schedules, resulting in negative consequences. This in turn can reduce consumers' utility and perceived convenience of online purchases (Rohm and Swaminathan, 2004) and trigger their complaints. Therefore, this study proposes the following hypothesis:

**H2.** The platform's lower performance, measured by a longer delivery time (H2a) and a higher late delivery rate (H2b), increases consumer complaints about the platform.

### 3.3. Effect of merchants' performance on complaints about the platform

The platform serves as an intermediary, providing distribution channels for merchants to reach consumers (Law et al., 2015). In the on-demand food delivery process, consumers interact with the platform in terms of information search, payment, order delivery, order receipt, and after-sales service requests instead of dealing with merchants directly. Thus, consumers may have cognitive bias and may blame the party that they directly interact with when merchants have poor performance (Folkes, 1988). Additionally, because merchant stores are listed on the platform, consumers think the platform has the responsibility to regulate those merchants to ensure their good performance (Hu, 2019). Thus, when merchants have poor performance, consumers may at least partially attribute the faults to the platform and thus complain about the platform. Part of the reasons is because consumers may perceive that various providers collaborate with each other and all of them are responsible for the same duty (Chen et al., 2017). Moreover, the platform usually has a brand effect that is more memorable than individual stores listed on it (Olson, 2008). Thus, according to information process theory (Gao et al., 2012), consumers have limited information processing capability and thus may not distinguish between the different parties (i.e., merchants and the platform), and thus complain about the platform even though the poor performance is caused by the merchants. Therefore, we hypothesize the following:

**H3.** Merchants' lower performance in individual attributes of product and service, measured by a lower rating of taste (H3a) and a lower rating of packaging (H3b), respectively, increases consumer complaints about the platform. Merchants' lower overall performance, measured by a lower positive rating ratio (H3c), a higher negative-to-positive ratio (H3d), and a lower popularity (H3e), increase consumer complaints about the platform.

### 3.4. Effect of the Platform's performance on complaints about merchants

The low service performance of the platform in terms of delivery increases consumers' waiting time, arousing their negative emotions (Tipples, 2008). According to the cognitive-affective model, although consumers' dissatisfaction is primarily cognitive based, affective elements such as consumer emotions and the external environmental factors also affect their dissatisfaction (Carr, 2007). Thus, the anxiety caused by longer waiting time leads to dissatisfaction regarding products and increased consumer complaints (Chebat et al., 2005). Further, longer waiting time increases consumers' time costs and thus raise their expectations of the quality of products (Kimes and Thompson, 2004). This causes a higher likelihood of consumer dissatisfaction and complaints (Kolodinsky, 1993). Further, late deliveries can reduce the quality of perishable products such as food, leading to consumers' cognitive bias and causing them to blame merchants when they receive low-quality products. Therefore, we propose the following hypothesis:

**H4.** The platform's lower performance, measured by a longer delivery time (H4a) and a higher late delivery rate (H4b), increases consumer complaints about merchants.

### 3.5. Effect of merchants' property on complaints about merchants and platforms

Merchants in a larger chain may achieve stronger brand effects (Kim and Kim, 2005) and more standardized operations by offering the same menus, prices, and food packages (Mallapragada and Srinivasan, 2017). Consumers are more familiar with the merchants in a larger chain and may have higher expectations from bigger brands (Xu, 2019). This makes consumers more likely to evaluate consumption as unsatisfactory when there is a wide gap between expected and perceived quality (Bearden and Teel, 1983). Additionally, a higher number of merchants in the chain gives consumers more references for comparison (Wang et al., 2018), which makes them more likely to complain if they receive unsatisfactory service.

More merchants in a chain may lead to consumers' stronger belief that the platform has the responsibility to design and implement the selection criteria of the merchants listed and regulate and monitor those merchants (Sutherland and Jarrahi, 2018). In addition, a larger chain increases consumers' expectations of the platforms' role in facilitating the development of these merchants through its network and operating rules (Luo et al., 2021). Thus, the chain characteristics of the merchant may also trigger consumers' complaints about the platform, with whom they make direct transactions, because they may think the platform fails to properly select and organize chain merchants. Therefore, this study proposes the following hypothesis:

**H5.** Merchants in a larger chain make consumers more likely to complain about the merchants (H5a) and the platform (H5b).

We present the theoretical framework of this study in Fig. 1.

## 4. Data analytics

### 4.1. Data collection

Our data were obtained from the Meituan platform, which provides online-to-offline on-demand food delivery services. Consumers can order food from merchants (i.e., restaurants) listed on the platform and then rate the merchant and leave comments after receiving the food. Consumers can also contact the platform through phone calls and complain about either the merchant or the platform if they are dissatisfied about a product or service. For each complaint, the platform will ask for the object of the complaint (i.e., merchant or platform) and record the detailed reasons of the complaint.

We collected complaint data on all the restaurants in Beijing, China



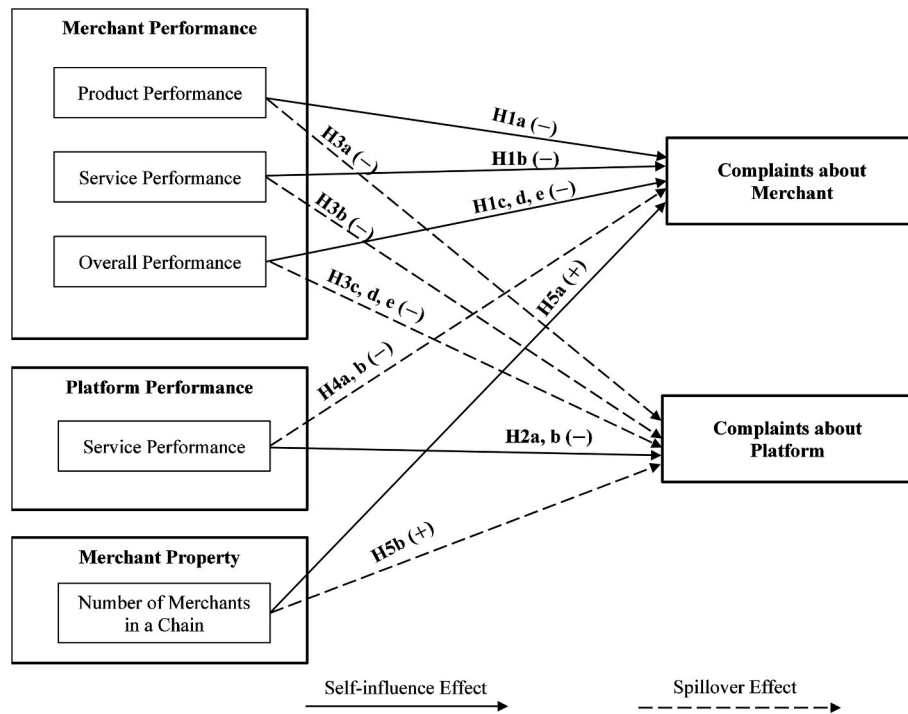


Fig. 1. The theoretical framework of this study.

that were listed on the Meituan platform from August 15 to September 14, 2019. After excluding restaurants with missing information, our dataset contained a cross-sectional data of 10,988 restaurants in Beijing. We limited our data collection to a single city to control for the effects of different cities on complaints (Cheng et al., 2019; Xu, 2020).

#### 4.2. Measurements

For the dependent variable, after referring to previous studies (e.g., Lapré and Tsikriktsis, 2006), to measure consumer complaints, we used complaint rate, namely, the ratio of the number of complaints to the number of orders (measured in %) for each restaurant during our study period. In detail, *Complaint\_merchant* and *Complaint\_platform* were measured by the corresponding complaint rate, namely, the ratio of the number of complaints about merchants to the number of orders and the ratio of the number of complaints about the platform to the number of orders, respectively.

Our independent variables included indicators for merchant and platform performance. Merchant performance was further classified into product, service, and overall performance. Specifically, product and service performance were represented by the ratings of taste (i.e., *Rating\_taste*) and packaging (i.e., *Rating\_packaging*), respectively. Each rating has a value from 1 to 5 on the Meituan platform, with a higher score indicating a better evaluation. Overall performance was measured by the ratio of the number of positive comments to the number of total comments (i.e., *Positive\_ratio*), the ratio of the number of negative comments to the number of positive comments (i.e., *Negative-to-positive\_ratio*), and the ratio of the number of total comments measured in thousands to the tenure of the restaurant measured in years (i.e., *Popularity*). Specifically, positive comments referred to the comments made by the consumers who rated the merchants' overall performance as 4 or 5 out of 5, and negative comments referred to comments whose ratings were 1 or 2 out of 5. Platform performance was mainly reflected by its service performance, which was measured by the average lead time in minutes from order placed to food received (i.e., *Lead\_time*) and the rate of late delivery (i.e., *Late\_rate*) for each restaurant during the study period.

In addition to the measurements of the platform and merchant performance, we also examined the property of merchants, which was represented by a series of categorical variables indicating the number of restaurants in the chain (i.e., chain size). Specifically, the categorical variables included independent merchants with a chain size of 1 (i.e., *Independent*), small chains with a chain size between 2 and 10 (i.e., *Small*), medium-sized chains with a chain size between 11 and 30 (i.e., *Medium*), and large chains with a chain size larger than 30 (i.e., *Large*). We examined the impact of chain size on consumer complaints. Moreover, because price can influence consumers' perception about consumption, referring to previous studies (e.g., Kim et al., 2014), we included price as one of our control variables. The variable of *Price* (in RMB) was measured by the average price of dishes offered by the merchant. Descriptive statistics for each variable are presented in Table 1, with the correlations between variables depicted in the pie chart in Fig. 2.

#### 4.3. Data analytics of consumer complaints

Table 2 lists the regression results of the impact of performance on complaints. Regressions 1 and 2 represent the results of the complaint

Table 1  
Descriptive statistics.

	Mean	S.D.	Min	Max
<i>Complaint_merchant</i> (%)	5.53	16.69	0	500
<i>Complaint_platform</i> (%)	8.26	20.99	0	769
<i>Rating_taste</i> (point)	4.51	0.33	1.70	5
<i>Rating_package</i> (point)	4.59	0.30	1.90	5
<i>Positive_ratio</i> (ratio)	0.93	0.04	0.35	1
<i>Negative-to-positive_ratio</i> (ratio)	0.05	0.05	0	1.33
<i>Popularity</i> (ratio)	1.09	1.43	0	35.62
<i>Lead_time</i> (minutes)	26.92	5	8.08	54.10
<i>Late_rate</i> (%)	0.04	0.03	0	0.33
<i>Independent</i> (%)	0.36	0.48	0	1
<i>Small</i> (%)	0.27	0.44	0	1
<i>Medium</i> (%)	0.14	0.35	0	1
<i>Large</i> (%)	0.23	0.42	0	1
<i>Price</i> (RMB)	65.18	30.63	20.23	295.86

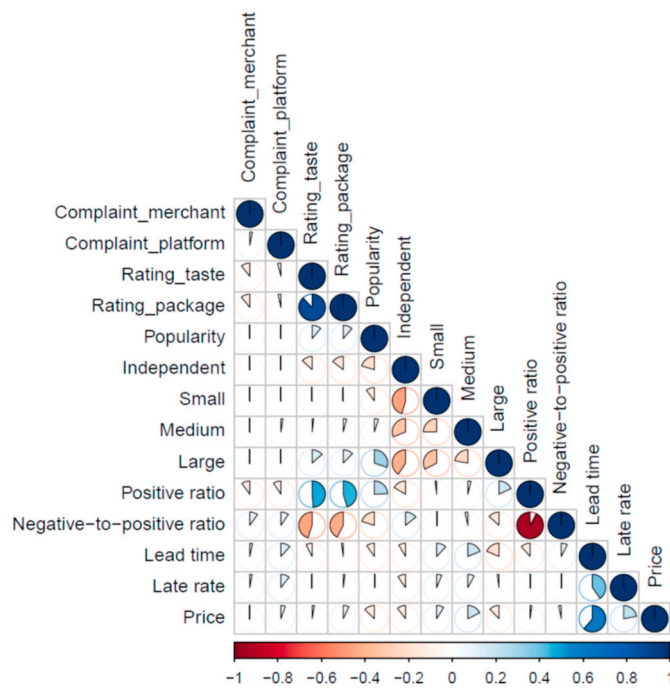


Fig. 2. Pie chart of correlations between variables.

**Table 2**  
The impact of performance on complaints.

Variable	(1)	(2)
	Complaint_merchant	Complaint_platform
<i>Rating_taste</i>	−0.022 (0.021)	0.016 (0.020)
<i>Rating_package</i>	−0.063*** (0.020)	−0.009 (0.020)
<i>Positive ratio</i>	−0.036 (0.026)	−0.032 (0.026)
<i>Negative-to-positive ratio</i>	0.032 (0.025)	0.068*** (0.025)
<i>Popularity</i>	0.010 (0.010)	0.014 (0.010)
<i>Lead time</i>	0.027** (0.013)	0.092*** (0.013)
<i>Late rate</i>	0.021** (0.010)	0.072*** (0.010)
<i>Small</i>	−0.000 (0.025)	−0.028 (0.024)
<i>Medium</i>	0.004 (0.031)	0.023 (0.030)
<i>Large</i>	0.058** (0.027)	0.050* (0.027)
<i>Price</i>	−0.010 (0.012)	−0.012 (0.012)
<i>Constant</i>	−0.014 (0.016)	−0.007 (0.016)
<i>N</i>	10,988	10,988
<i>F-statistics</i>	17.725	27.743

Note: \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Standardized coefficients are reported. Numbers in parentheses are standard errors.

rate about the merchant and the platform, respectively. Regressions 1 and 2 show that the poor performance of the merchant/platform increases consumer complaints about the merchant/platform. We found that consumers complain about the merchant because of its poor performance in its packaging service (i.e., Regression 1) and complain about the platform because of its longer wait time and higher late rate (i.e., Regression 2). Additionally, Table 2 shows that the poor performance of the merchant can increase complaints about the platform and vice

versa. To elaborate, a longer wait time and a higher late rate increases consumer complaints about the merchant (Regression 1), and a higher proportion of negative comments about the merchant increases consumer complaints about the platform (Regression 2). Moreover, compared with independent merchants, large chains increase consumer complaints about both the merchant and the platform.

#### 4.4. Robustness analysis

We conducted further analysis to prove the robustness of our empirical results. First, considering the relatively high correlation between the ratio of the number of positive comments to the number of total comments (i.e., *positive ratio*) and the ratio of the number of negative comments to the number of positive comments (i.e., *negative-to-positive ratio*), we removed *positive ratio* from our independent variables to avoid the multicollinearity issue and improve the estimation efficiency (Stock and Watson, 2007). The results are presented in Table 3, which is highly consistent with our previous estimation in Table 2 and thus validates the robustness of our empirical results.

In addition, referring to previous studies (e.g., Abrahams et al., 2015; De Vries et al., 2016), we employed a principal component analysis to reduce dimensionality and construct aggregated indices to check the robustness of our empirical results. Table 4 displays the results of the principal component analysis based on five merchant performance indicators and two platform performance indicators. We report the varimax rotated factor loadings of two components with eigenvalues larger than 1.3, which account for more than 60% of the variation. Factor loadings larger than 0.3 in absolute value are displayed in bold (Cobb-Clark et al., 2019). Table 4 shows that the first component loads high on merchant performance indicators such as ratings and positive ratio, and we thus designate this component the merchant index. The second component loads high on platform performance indicators such as late rate and lead time, and we label this component the platform index. A higher merchant index indicates that the merchant has higher ratings and a higher positive ratio, representing a better performance by the merchant. A higher platform index indicates that the platform has a longer lead time and higher late rate, representing a lower performance by the platform.

**Table 3**  
Robustness analysis.

Variable	(1)	(2)
	Complaint_merchant	Complaint_platform
<i>Rating_taste</i>	−0.025 (0.020)	0.014 (0.020)
<i>Rating_package</i>	−0.063*** (0.020)	−0.009 (0.020)
<i>Negative-to-positive ratio</i>	0.063*** (0.011)	0.096*** (0.011)
<i>Popularity</i>	0.008 (0.010)	0.013 (0.010)
<i>Lead time</i>	0.029** (0.013)	0.094*** (0.013)
<i>Late rate</i>	0.021** (0.010)	0.072*** (0.010)
<i>Small</i>	−0.001 (0.025)	−0.028 (0.024)
<i>Medium</i>	0.002 (0.031)	0.022 (0.030)
<i>Large</i>	0.054** (0.027)	0.047* (0.027)
<i>Price</i>	−0.011 (0.012)	−0.013 (0.012)
<i>Constant</i>	−0.012 (0.016)	−0.006 (0.016)
<i>N</i>	10,988	10,988
<i>F-statistics</i>	19.306	30.364

Note: \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Standardized coefficients are reported. Numbers in parentheses are standard errors.

**Table 4**  
Principal component analysis of merchant and platform performance.

Variable	Merchant index	Platform index
Eigenvalues	2.884	1.407
Variation captured	0.413	0.201
Merchant performance indicators		
Rating taste	<b>0.4886</b>	0.0429
Rating package	<b>0.4796</b>	0.088
Positive ratio	<b>0.5063</b>	−0.0603
Negative-to-positive ratio	<b>−0.4929</b>	0.0335
Popularity	0.1711	−0.1266
Platform performance indicators		
Lead time	−0.0326	<b>0.7009</b>
Late rate	0.041	<b>0.6917</b>

Note: The loadings are varimax rotated to facilitate interpretation, and loadings greater than 0.3 in absolute value are reported in bold.

Table 5 presents the results of the effects of the merchant index and platform index on complaints. We observed that a higher merchant index (i.e., good performance by the merchant) reduces complaints about both the merchant and the platform, and a higher platform index (i.e., poor performance of the platform) increases complaints about both the merchant and the platform. Our results are consistent with previous empirical findings, indicating the existence of both the self-influence effect and the spillover effect.

## 5. Discussion

### 5.1. Self-influence effect of consumer complaints

From regressions 1 and 2 in Table 2, we found that consumer complaints have self-influence effects. Our results partially support hypothesis 1—merchants' low service performance increases consumer complaints about the merchants. In this study, the service offered by the merchants we focus on is packaging (H1b), which reflects the first impression of products when consumers receive them. Bad packaging triggers consumer complaints after they have waited for delivery. However, our findings do not suggest the existence of a significant relationship between low product performance (H1a) and overall performance (H1c, d, e) and consumer complaints. Although low product performance arouses consumer dissatisfaction, as shown by the low taste ratings, it does not trigger complaints. Part of the reasons for this may be that the products in this study are food products, whose taste can be subjective. Additionally, taste is difficult to measure and describe and can result in expected redressal difficulties, thus discouraging consumer complaint intentions (Blodgett and Anderson, 2000). Consumers who complain usually point out a specific issue or attribute that arouses their complaints (Ward and Ostrom, 2006). The overall performance of a merchant can be relatively vague to consumers, making it difficult for them to complain.

Our regression results fully support hypothesis 2. We found that longer delivery time (H2a) and higher late delivery rates (H2b) increase consumer complaints about the platform. Long delivery time indicates low speed, and high late delivery rates indicate the unreliability of the delivery service, resulting in the poor performance of the two most

**Table 5**  
The effect of merchant and platform performance indices on complaints.

	(1) Complaint_merchant	(2) Complaint_platform
Merchant index	−0.126*** (0.010)	−0.077*** (0.010)
Platform index	0.036*** (0.011)	0.141*** (0.011)

Note: \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Standardized coefficients are reported. Numbers in parentheses are standard errors.

important measurements of delivery performance (Hu and Munson, 2007). The employees with whom consumers interact directly when receiving packaged food are from the platform, so low delivery performance directly triggers consumers' complaints toward the platform.

### 5.2. Spillover effect of consumer complaints

Consumer complaints also have a spillover effect. The findings from regressions 1 and 2 in Table 2 partially support hypothesis 3. A high negative-to-positive ratio of merchants (H3d) increases consumer complaints about the platform. A high negative-to-positive ratio indicates a common product or service failure by merchants, which makes consumers doubt the strictness of the regulations and the supervision of the merchants by the platform. However, merchants' low product (H3a) and service quality (H3b) do not increase consumer complaints about the platform. This is because consumers have a relatively clear idea that the product and service come from the merchants, and the platform only serves as an intermediary passing those products and services on through delivery. Thus, when merchants are responsible for the poor performance of products and services, consumers only complain about the merchants rather than the platform. In addition, we found a low positive ratio (H3c) and a higher popularity (H3e) do not increase consumer complaints about the platform. This may be due to that consumers care more about bad performance rather than good or intermediate performance and the number of comments when deciding their complaint behavior.

Moreover, the findings completely support hypothesis 4. Longer delivery time (H4a) and higher late delivery rates (H4b) increase consumer complaints about merchants. Longer waiting time stimulates consumers to perceive high risk and arouse negative emotions such as impatience and frustration. This negative affection influences consumers' cognitive judgments and makes them conduct a biased evaluation of merchants' performance about the product and service. Additionally, longer waiting time increases consumers' time costs and expectations, making it difficult for the benefits of merchants' products and services to offset the total costs and eventually leading to complaints.

### 5.3. Impact of merchants' property on consumer complaints

The regression results in Table 5 fully support hypothesis 5. We found that the merchant property of belonging to a large chain increases consumer complaints about the merchant. More merchants in the chain indicate more significant brand effect and standardized operations across merchants and makes it easier for consumers to compare. This raises consumers' expectations, and consumers tend to complain when the merchant's performance is worse than other merchants' performance in the same chain. In addition, we observed that a large chain increases consumers' complaints about the platform. This is because the platform is responsible for selecting and regulating the merchants listed on the platform, especially for large chains from which consumers have high and clear expectations. Because consumers make direct transactions with the platform, they may attribute fault to the platform for not properly selecting and regulating the large chains. Therefore, they may complain about the platform.

## 6. Theoretical and managerial implications

### 6.1. Theoretical implications

The findings of our study contribute to the literature regarding consumer complaints primarily in two ways. First, some previous studies (e.g., Lapré and Tsikriktis, 2006; Tsikriktis and Heineke, 2004) used consumer complaints as a measure or proxy of their dissatisfaction. However, we found not all consumer dissatisfaction with merchants leads to complaints about merchants. The findings suggest that in the

on-demand service context, consumers' complaints about merchants are much more often triggered by their dissatisfaction with service than with product performance. In this way, our study distinguishes consumer complaints, as a negative behavior, from consumer dissatisfaction, as a perception. The findings reveal how the link between consumer dissatisfaction and complaints varies by different attribute-level performance.

Second, many of the previous studies about consumer complaints (e.g., Bastani et al., 2019; Raval, 2020) assumed that the reason and object of the complaints were the same. That is, the product or service provider whom consumers complain about is the party responsible for the failure. However, in this study we found that the reasons consumers complain do not exactly match the objects they complain about. On the one hand, we found that consumers may complain about the platform if the merchants' overall performance is poor. On the other hand, consumers can complain about the merchants if the poor performance is caused by the platforms' delivery performance. In this way, the findings of this study suggest the existence of the spillover effect in addition to the self-influence effect.

## 6.2. Managerial implications

Via empirical evidence of consumer complaints regarding an on-demand service platform and the merchants listed there, we found the determinants of consumer complaints about the merchants and the platform, and not all the factors analyzed in this study trigger consumer complaints. In particular, for some attributes or aspects, even though consumers are dissatisfied, as shown by the low ratings, they did not complain. Therefore, with limited resources, firms need to decide their priorities regarding using these resources before taking actions to improve their products and services. This study suggests that firms should improve the factors that trigger consumer complaints. In this way, firms' improvements will meet consumers' urgent and basic needs and lead to more efficient actions for alleviating consumers' negative perceptions and behaviors.

Additionally, the results of this study suggest that only focusing on the firm's own performance is not enough. Because of cognitive bias, consumers may vent their anger on the party that is not to blame. In other words, they may attribute failures caused by the platform to merchants, or attribute failures caused by merchants to the platform. Many consumers consider the platform and the listed merchants as an integrated whole when paying and consuming products and services. Thus, one party's product or service failure cannot be totally separated from that of the other party. One party's bad performance will give consumers the impression that the whole group performed poorly, thus damaging the whole group's reputation. Platforms should therefore set a clear entry standard for merchants. Only merchants who meet certain qualifications should be listed on a platform. For example, Uber requires its driver to be licensed to drive in the U.S. for at least one year, or three years if under age 23. The car provided by the drivers cannot exceed 15 years old to ensure safety and quality. Further, the platform should have clear regulations and conduct intensive supervision of the listed merchants. It should have an efficient complaint management system, including product or service recovery actions, and should implement after-sales service to handle both the complaints about the platform and the merchants. As for merchants, they should consider the platform's operations and reputation when deciding to list themselves there. The platform serves as an intermediary and order fulfiller for the merchants, but it also presents an image of the merchant to consumers. The platform and its employees are parties who interact with consumers directly. A bad carrier will damage the reputation of the objects on the carrier. Therefore, the performance of a party involved in offering products or services to consumers will affect their perception of the other parties being involved as well.

Finally, merchants and platforms should consider the properties of the listed merchants on the platforms when trying to understand

consumer complaint behavior and needs. In this study we found that the merchant property of belonging to a large chain affects consumers' perceptions of them and consumers' consequent complaint behavior. Although the larger chains can have many advantages, such as high brand effect and economics of scales, our findings suggest that they may also need to face the challenges of increased consumer complaints. Thus, the findings in this study particularly urge merchants in large chains to maintain high product and service performance to meet consumers' needs, which will in turn reduce consumers' complaints. In addition, when product or service failures occur or performance largely falls below consumers' expectations, the merchants should implement immediate and efficient recovery actions, such as offering compensation, committing to improvements, and providing explanations to alleviate consumers' negative perceptions and behavior. Platforms should take more responsibility for improving the admission mechanisms for chain merchants, especially those with large sizes. Our findings urge platforms to implement higher standards and input more resources such as adopting new technologies and hiring more supervisors to regulate large chains and support them in achieving high quality and efficiency because consumers tend to link poor performance of the large chains with the platform. As the last note, complaint management and service recovery actions incur external failure costs. For both the merchants and platforms, implementing more efforts to control and ensure the quality from the first step of the product manufacture or service process can save huge costs for the firms, alleviate the unfavorable consequence of negative word of mouth, and raise their reputation (Chang et al., 2015).

## 7. Concluding remarks

Using empirical evidence from an on-demand food delivery platform, in this study we examined the influential factors triggering consumer complaints about merchants and service platforms. The findings suggest that the determinants of consumer complaints about service platforms and merchants differ and that not all attributes and overall performance indicators of consumer dissatisfaction lead to complaints. The reasons consumers complain do not exactly match the objects they complain about. We found that both self-influence and spillover effects of consumer complaints exist regarding the performance of merchants and the platform. That is, worse service performance by merchants leads to more consumer complaints about both the merchants and the platform; and the platform's poor delivery service triggers consumer complaints about the platform as well as the merchants. Further, when a merchant belongs to a large chain, this has the significant self-influence effect and spillover effect on consumer complaints. Our findings help merchants and platform managers better understand why and about whom consumers complain, which is the first step to implementing complaint management to retain consumers and enhance firms' financial performance.

Our study has several limitations, which provide direction for future research. First, our analysis is based on cross-sectional data, and future research can extend this study by collecting a panel data set. In this way, the effect of time on consumer complaint behavior can be examined. In addition, our data sample is from consumer complaints about restaurants located in Beijing, China, on Meituan. Future studies can extend this study by collecting data from multiple cities to generalize the findings or compare the differences in consumer complaint behavior toward restaurants in various locations. Second, consumers' personal factors, such as personality, and demographic characteristics, such as age, education, and gender, may also play a role in affecting their consumption perceptions and their complaint behavior. Future studies can incorporate these characteristics into analyses. Third, our study mainly examined the reasons for consumer complaints, and future research can focus on the consequences of these complaints, which are caused by different reasons, on the behaviors of consumers and performance of the firms. The behavior of consumers who complain and who observe others' complaints can both be analyzed.



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