Research on Response Strategies of O2O Take-Out Platform Merchants Based on Eye Tracking Experiment

Shengchun Ding[1], Yilin Wang[1(✉)], Linlin Hou[1], Yue Zhang[2], and Jingyao Cai[3]

[1] School of Economics and Management, Nanjing University of Science and Technology, Nanjing, China
yilinwang@njust.edu.cn

[2] Department of Accounting and Information Systems, Northridge California State University, California, USA
jeff.zhang@csun.edu

[3] School of Computer Science and Engineering, Nanjing University of Science and Technology, Nanjing, China

Abstract. This paper explores the different types of negative comments on an O2O beverage takeout platform to find the types of replies consumers pay more attention to and the types of remedies better impacting on consumers' opinions. This paper employs eye tracking system to capture the eye movement trajectory and the fixation point of experiment subjects. By analyzing the sight fixation time, the initial sight fixation time and the number of sight fixation in the region of interest, it can be concluded that consumers pay more attention to the replies by the merchants to offer apology and compensation for negative comments based on objective quality and attributes of such comments. For the negative comments based on subjective experience and emotional judgment, consumers are more concerned about the explanation in the merchant replies. Combined with the results of the experiment, this paper puts forward corresponding strategies for dealing with negative comments, so as to enable firms to carry out effective online word-of-mouth marketing and establish and maintain a good corporate image.

Keywords: merchant responses · negative reviews · service remedy · eye tracking experiment

1 Introduction

China's food delivery transactions will exceed 600 billion yuan (nearly $100 billion) in 2020 [12]. Catering/food delivery service platforms usually provide user comment function on the platform, which allows consumers not only receive basic product information from merchants, but also learn about other consumers' experience and product/service evaluation in consumer reviews of merchants/products/services.

Scholars generally believe that negative reviews have a greater impact on consumers' purchasing decisions and a wider range of influence [1]. In response to online negative

comments, many online shopping platforms have enabled merchants to reply to customer comments, giving businesses the opportunity to thank, apologize to, or explain and justify the functions or situations of/related to their products/services with the customers.

This paper analyzes merchants' responses to negative reviews on O2O food delivery platforms, and explores the impact of merchants' different response methods on potential loyal consumers' purchase intentions.

2   Literature Review

Research by scholars such as Bitner [2] shows that the neglect of negative reviews by businesses will intensify users' strong dissatisfaction with products and related companies. In terms of the remedial effect of merchants' responses to negative reviews, Holloway et al. [3] proposed that the combined strategy's trust repair effect is better than the individual strategy. Tax et al. [7] proposed service remedy procedures, including identifying service failures, solving customer problems, communicating and Service failure classification, integration of data, and improvement of integrated services. Smith et al. [6] classified responses as four attributes: compensation, timeliness, apology, and initiation, and explored their remedial effects on service failures of different types and scales. Zhao et al. [11] found that the timeliness and quality of business responses can adjust product sales and negative ratings, and that untimely and perfunctory business responses have no obvious impact. From the perspective of attribution of consumers' negative evaluations of products, Zheng et al. [13] proposed and confirmed that merchants' evaluations of the brand from information disseminators are the same as those of other communicators, and that information broadcasters' comments on a certain brand and their The two angles of explaining the response to the same degree of comments from other brands can reduce the level of consumer brand attribution, thereby reducing the negative impact of negative reviews.

Studies by many scholars have confirmed that merchants' apology compensation responses and apology explanation responses for negative reviews have a significant effect on repairing purchase intentions. But not all negative reviews are of the same type. How can businesses respond to different types of negative reviews with response strategies that have been proven to be significant in research to makes the reply text of the merchant more concerned by consumers. There is less research in this area.

3   Research Hypotheses and Experimental Design

3.1   Hypothesis

The influence of types of negative reviews on the attention of the browsing consumers.

The analysis of review information on O2O takeout sites shows that when consumers review purchased products, they basically evaluate them from two dimensions: one is reviews based on objective quality and attributes, the second is a comment based on subjective experience and emotional judgment. When the merchant's flaw causes the customers' actual damage in interest or loss in expected functions of the product/service, the customers would more likely expect material compensation commensurate to the

value of the losses; while when the merchant's flaw is in the merchant's attitude or service delivery manner that caused the customer's emotional loss, the consumers would more likely expect psychological compensation commensurate to the emotional loss [10].

Based on the above analysis, this article proposes the following hypotheses:

H1a: When consumers browse negative reviews based on objective quality and attributes of the product/service, the consumers will have longer eye fixation time in their gazing the merchant responses of apology and compensation than apology and explanation;
H1b: When consumers browse negative reviews based on subjective experience and emotional judgment, they will have longer fixation time in their gazing the merchant responses of apology and explanation than apology and compensation;
H2a: When consumers browse negative reviews based on objective quality and attributes, they will have longer average first fixation time gazing the merchant responses of apology and compensation than they do the apology and explanation type of responses;
H2b: When consumers browse negative reviews based on subjective experience and emotional judgment, they will have longer average first fixation time gazing the merchant responses of apology and explanation than they do the apology and compensation type of responses;
H3a: When consumers browse negative reviews based on objective quality and attributes, they watch the business apology and compensation responses more frequently (with higher fixation times) than they do the apology and explanation responses;
H3b: When consumers browse negative reviews based on objective quality and attributes, they watch the business apology and explanation more frequently (with higher fixation times) than the apology and compensation responses;

The influence of the degree of attention on the remedial effect.

If consumers have a willingness to buy and a tendency to pay attention, they will have more fixation behavior reflected in their visual behavior [8]. It is found that the combination of total fixation time duration, times of fixation, and average first fixation time in the area of interest can effectively reflect the attention concentration of the subjects of the experiment [9]. Therefore, this article proposes the following hypotheses:

H4a: The longer the fixation time of the consumer's gazing the merchant response, the better the remedial effect perceived by the consumer from the merchant's response.
H4b: The longer the consumer's first fixation time in gazing merchant response, the better the remedial effect of the merchant's perception of the consumer.
H4c: The more the consumer's fixation (the larger the fixation times), the better the remedial effect of the merchant's response is perceived by the consumer.

3.2   Methodology and Experimental Data

For this study, negative reviews of milk tea drinks on an O2O takeout platform were used as data for this experiment. In order to minimize the classification errors caused by personal subjective judgment, the experiment invited 10 graduate students who had rich experience in online shopping to classify all types of questions in the negative reviews of milk tea using a card classification method.

In order to explore the perceived remedial effects of potential loyal consumers of milk tea on the different responses from the merchant, the experiment selected subjects who had the experience of 1–3 purchases of milk tea in the past month. According to the gender ratio of milk tea consumer statistics characteristics, in the 20 eligible subjects for this experiment, we selected 6 male subjects and 14 female subjects.

For the eye-tracking portion of the experiment, we chose Tobii Glasses 2 eye tracker produced by Tobii Company. Subjects will rate the effectiveness of the merchant's response to each negative review. The subject's answer was coded on a 7-point Likert's scale. The larger the number in the response, the better the degree of remedy. The average score of all volunteers on the same areas of interest (AOI) was taken as the remedial effect score of the merchant's response in this AOI.

4   Data Analysis

The specific division and anticipation are shown in Table 1. The results of the correlation analysis between eye movement indicators and the service remedial effect scored by the subjects are shown in Table 2.

4.1   Different Types of Negative Comments and Fixation Time

In the case of an O2O food delivery platform the comments and responses are concise and easy to understand, which will not pose difficulty or cause ambiguity in semantic understanding, so there is no difficulty in comprehension. Therefore, if a consumer watches this part of the content for a longer time, then s/he must be more interested in that certain type of review information or the corresponding merchant responses. According to Table 2, it can be seen that the fixation time is significantly correlated with the service remedial effect ($P = 0.002 < 0.01$), which means that the longer the fixation time, the better the merchant service recovery effect perceived by the subjects.

By analyzing the data recorded by the eye trackers in Table 1, it can be seen that for the negative reviews based on objective quality and attributes, the subjects had a total of 111.2 s of fixation when they responded to the merchant's apology and explanation replies, and 189.7 s for the apology and compensation replies. For the negative reviews based on subjective experience and emotional judgment, the subjects' total attention time for the merchant's apology-explanation reply and apology-compensation reply was 115.4 s and 96.3 s, respectively. It can be seen that in the negative reviews based on objective quality and attributes, the total attention time on the merchant's "apology and compensation" type of reply is much longer than the total attention time on the "apology and explanation" type of reply. In the negative reviews based on subjective experience and emotional judgment, the "apology and explanation" reply received a slightly longer fixation time than the merchant's "apology and compensation" reply.

4.2   Different Types of Negative Comments and Time of First Fixation

Hu et al. [4] proved in their research that the first fixation time reflects the degree of consumers' attention to the product and brand information after browsing the advertisement content. The longer the first fixation, the more the product and brand can attract

Table 1. Division and Anticipation of Interest Regions

Types of Negative Comments	Types of Merchant's Response	AOI Number	Fixation Time (m)	Remedial Effect	Average first fixation time	Remedial effect	Fixation times	Remedial effect
Based on objective quality and attributes	Apology and explanation reply	AOI1	29.6	5.2	0.30	5.2	140	5.2
		AOI3	32.8	6.0	0.33	6.0	80	6.0
		AOI5	17.7	5	0.52	5	44	5
		AOI7	31.1	5.4	1.29	5.4	59	5.4
		total	111.2	21.6	2.44	21.6	323	21.6
	Apology and compensation reply	AOI2	59.6	6.4	1.49	6.4	101	6.4
		AOI4	47.6	6.2	0.59	6.2	98	6.2
		AOI6	53.4	6.2	2.26	6.2	96	6.2
		AOI8	29.1	5.8	0.34	5.8	46	5.8
		total	189.7	24.6	4.68	24.6	341	24.6
Based on subjective experience and emotional judgment	Apology and explanation reply	AOI9	44.3	6.4	1.4	6.4	79	6.4
		AOI11	23.0	6.0	0.66	6.0	45	6.0
		AOI13	20.7	5.8	1.24	5.8	40	5.8
		AOI15	27.4	6.2	0.29	6.2	49	6.2
		total	115.4	24.4	3.59	24.4	213	24.4
	Apology and compensation reply	AOI10	32.4	6.2	1.35	6.2	72	6.2
		AOI12	21.2	5.6	0.52	5.6	41	5.6
		AOI4	13.1	5.4	1.29	5.4	23	5.4
		AOI16	29.6	6.0	0.23	6.0	52	6.0
		total	96.3	23.2	3.39	23.2	188	23.2

Table 2. Correlation analysis of eye movement indicators and subjects' perceived remedial effect

		Fixation time	First fixation time	Fixation times
Remedial effect	Pearson Correlation	.707	.507	.636
	Sig. (2-tailed)	.002	.032	.019

consumers' attention. It can be seen from Table 2 that the first fixation time is significantly correlated with the service remedial effect ($P = 0.032 < 0.05$), that is, the longer the first fixation time, the better the merchant service remedial effect perceived by the subjects.

After analyzing the eye movement data, it was found that in the context of negative reviews based on objective quality and attributes, the time for the subjects to look at the merchant's "apology and explanation" reply for the first time was 2.44 s, while the

first time to look at the merchant's "apology and compensation" response was 4.68 s. For negative reviews based on subjective experience and emotional judgment, the first fixation duration of the subjects for the merchant's "apology and explanation" replies was 3.59 s, and the first gaze duration for the merchant's apology compensation reply was 3.39 s. From this, it can be found that for negative reviews based on objective quality and attributes, the average time for consumers to look at the merchant apology compensation response for the first time is longer than the average time for apology explanation responses. For negative comments based on subjective experience and emotional judgment, the average first fixation time is longer for apology and explanation responses.

4.3 Different Types of Negative Comments and the Number of Fixations

The number of fixations is an eye movement indicator that can be used to understand the subjects' attention to a certain area from a psychological point of view. The more fixations in the area of interest, the more important this area is for the observer and the more it can attract attention. It is reflected in the experiment that if the subject is more interested in a certain type of response, the more times s/he will look back and confirm this type of response, the more fixation points will be formed. According to Table 2, it can be seen that the number of fixations is significantly correlated with the service remedial effect (P = 0.019 < 0.05), that is, the more times fixations happened, the better the business service remedial effect perceived by the subjects.

After analyzing the data recorded by the eye tracker, it was found that for the negative reviews based on objective quality and attributes, the total number of times the subjects watched the merchant's apology explanation reply and apology compensation reply were 323 and 341, respectively. For negative reviews based on subjective experience and emotional judgments, the total number of apology explanation replies and apology compensation replies of the subjects watching the merchant were 213 and 188 respectively. For negative reviews based on objective quality and attributes, the total number of apology and compensation replies from consumers looking at merchants is more than the total number of apology explanation replies. For negative comments based on subjective experience and emotional judgments, the total number of gazes received by apology and explanation responses was more.

4.4 Consumers' Fixation Hotspots and Their Trajectories

The different ways of responding to different dimensions of negative reviews by businesses have different attractiveness to consumers' attention, which can also be reflected by the gaze heat map and the gaze trajectory map generated by eye tracking.

From the heat map in Fig. 1 and the trajectory map in Fig. 2, it can be seen that the negative comments on the perception of "sweetness" are more "eye-catching" in the apology-explanation response than in the apology-compensation response, and there is higher density of the trajectory distribution. Since there is not much coding difficulty in the reply text, it shows that consumers are paying more attention to the apology explanation reply. For negative reviews based on subjective experience and emotional

Fig. 1. Gaze heat map showing hot spot comparison of apology-explanation reply (left) and apology-compensation reply (right) to negative comments based on subjective experience and judgment (sweetness)

Fig. 2. Gaze trajectory map showing the trajectory of attentions on the apology-explanation response (left) and apology-compensation response (right) to negative reviews of the type of subjective experience and judgment

judgment, businesses should adopt the method of apology explanation reply more often so as to remedy service error.

5   Discussion and Conclusion

Based on the analysis of the above experimental data, it can be obtained that all the hypotheses proposed in this paper are valid. It can be found that when faced with negative reviews based on objective quality and attributes, consumers pay more attention to the merchant's apology and compensation; when faced with negative reviews based on subjective experience and emotional judgment, consumers pay more attention to the merchant's apologies for explaining the content of the reply.

Negative evaluations are actually negative behaviors generated by customers after they have experienced dissatisfactory services. Dissatisfactory experiences may be that the product does not adequately meet the standard or the service provided does not adequately meet consumers' needs. According to the attribution theory, consumers will attempt to discover the root causes of service failures. Negative reviews based on objective quality and attributes are often caused by products that do not meet standards.

Consumers will directly attribute them to merchants. At this time, merchants' apology and compensation can make up for their mistakes; negative reviews based on subjective experience and emotions vary from person to person, and different people have different experience of using the same product/service. Therefore, merchants' apology and explanation could better answer customers' questions and dissolve customer dissatisfaction.

6   Marketing Implications

(1) "Apologize + compensation" response strategy

For the negative reviews based on objective quality and attributes, merchants can adopt the reply method of "apology + compensation" to improve the remedial effect of the merchants on product flaws/service failures. The customers and potential customers directly involved in this user feedback believe that even if there is a service or product problem, the merchant has a complete service remedy system, which promotes consumers' trust in the merchant, and thereby increases consumers' willingness to (repetitively) buy from this merchant.

(2) "Apologize + Explanation" response strategy

When the content of negative reviews mainly expresses personal subjective experience and emotional judgment, potential customers cannot judge the quality of products/services through such reviews that have great differences in individual preferences. If a company adopts a response strategy of compensation, it will cause consumers to be troubled by the existing problems of the product. As a result, consumers will trust the content of negative online reviews and hinder consumers' willingness to buy. Therefore, for the negative reviews of subjective experience and emotional judgment, merchants can adopt the reply method of "apology + explain" to better remedy the negative effects caused by the cognition of "service error" and prevent individual consumers' complaints from becoming a "factual cognition" accepted by other consumers.

Gender factor, as one of the most important demographic factor, may also have an impact on the perceived remedial effect of merchant responses. In the future, we can further study whether businesses should adopt different strategies for responding to negative reviews based on the gender of the user.

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