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# Do managerial communications improve customer satisfaction and eWOM? The moderating effect of response authenticity

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As customer reviews are becoming increasingly valued in the hotel industry, hotel managers are actively responding to customer reviews, and many researchers are investigating the effects of managerial responses. Previous studies, however, have mainly focused on open communication that takes place on social platforms or online travel agency (OTA) websites. Considerations about interaction contexts and specific response styles are also lacking. These limitations raise research questions, such as whether private interactions between managers and customers would be effective, whether the effect would differ between dissatisfied and satisfied customers, and what role the authenticity of managerial responses would play in these interactions. To address these questions, we investigated the effect of private managerial interactions. The effect of a managerial apology on customers' future satisfaction, the effect of a managerial "thank you" on customers' future electronic word-of-mouth (eWOM), and the moderating effect of response style (i.e., personalization and length) were examined. We analyzed data from a customer satisfaction survey in which customers leave feedback after their stay and hotel managers respond to each customer personally via email. Our results reveal that a private managerial apology increases customers' future satisfaction only when it is long or personalized. A private managerial "thank you" positively affects customers' eWOM in the next period. This research provides empirical evidence for the effect of private managerial interactions, extending the existing discussions on the effect of managerial responses to the private digital communication context. This research contributes to the research areas of managerial response, service recovery, and digital communications.

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## Introduction

In the hotel industry, online bookings are prevailing, and customer online reviews are easily found. Customer online reviews greatly influence others' hotel choices (Casado-Díaz et al., 2017). In a recent survey, about 70% of respondents trusted others' recommendations, and more than 90% trusted nonpaid recommendations more than advertisements for their hotel choices (Barreiros, 2021). In response to this shifting hotel customer behavior, a managerial response, which refers to a manager's response to customer reviews, is becoming increasingly important. According to previous studies, managerial responses affect consumer booking behavior, hotel ratings, electronic word of mouth (eWOM), etc. (e.g., Chen et al., 2019; Gong et al., 2022; Guo et al., 2022; Han and Anderson, 2022; Proserpio and Zervas, 2017; Ravichandran and Deng, 2022).

While researchers are giving remarkable attention to the effect of managerial responses, it is noteworthy that previous studies were conducted with several constraints. First, most previous studies mainly focused on the effect of open communication that occurs on social platforms or websites of online travel agencies (OTA), therefore failing to provide enough information on the effect of private interaction (e.g., Chen et al., 2019; Chevalier et al., 2018; Gong et al., 2022; Guo et al., 2022; Proserpio and Zervas, 2017; Ravichandran and Deng, 2022; Wang and Chaudhry, 2018; Xu et al., 2020; Xu and Zhao, 2022). The effect of open communication mostly comes from observing managerial responses to other customers, and the effects of receiving a managerial response and observing others receiving it are different (Gu and Ye, 2014). Therefore, a private managerial response that builds rapport directly with each target customer may work differently.

Next, many previous studies analyzed the effect of the act itself of responding without considering particular contexts and specific response styles (e.g., Chevalier et al., 2018; Proserpio and Zervas, 2017; Xie et al., 2016). The effect of managerial response can be different depending on the context of interactions. For example, since the post-purchase behavior of satisfied vs. dissatisfied customers is different, a managerial interaction's mechanism and effects can differ between satisfied and dissatisfied customers. Also, even though a manager sends a message, if it is perceived as inauthentic and superficial, it might not be effective.

These limitations raise the following research questions: (1) Does private managerial interaction between hotel managers and consumers affect consumer behavior? (2) Does the effect differ depending on the context: interaction with satisfied customers vs. dissatisfied customers? (3) What is the role of the authenticity of managerial response? Building on the extant research, the current study investigates the effect of managerial response in a private interaction context by analyzing customer satisfaction survey (CSS) data, where customers send feedback via email and hotel managers provide an accordance response to each customer. We consider the context of interactions by distinguishing managerial interactions between interactions with satisfied customers who leave positive reviews and interactions with dissatisfied customers who leave negative reviews. We also test the moderating effect of personalization and length that determine the authenticity of a message.

Therefore, the purpose of this study is twofold: (1) to investigate the impact of a private managerial response to a customer's survey feedback about their previous stay on the customer's satisfaction with and eWOM of the next stay and (2) to examine the moderating effect of personalization and length. Hotel managers are spending significant time and effort in managerial communications, and hotel companies are actively investing in automated managerial response systems. By offering specific and

useful information that can help these efforts, the current study contributes to academia and the industry. In the following, we develop hypotheses based on a thorough review of relevant studies. Then, an empirical method including data and a model is introduced. Next, after the empirical results are presented, theoretical and practical implications are discussed. Lastly, limitations and future research directions are suggested.

## Literature review and hypotheses

According to expectation confirmation theory, satisfaction is a function of expectations and perceived performances (Oliver, 1980). Consumer satisfaction is determined by the perception of how well the experience performed compared to expectations. Managerial response to the (positive or negative) review left by consumers is a hotel's marketing effort to manage the customer experience. At this point, even if consumers perceive the same value for this effort, the effect of managerial responses can vary due to different expectations. While consumers who have a bad experience on a previous stay have low expectations, those with a good experience have high expectations for the hotel. Accordingly, the satisfaction of previously dissatisfied customers may increase by a managerial response in the next period, yet the satisfaction of satisfied customers may not. As satisfied customers already have high perceptions and expectations regardless of managerial interactions, a hotel manager's response to their positive reviews might be taken for granted and thus would not increase satisfaction by a significant level in the next period. Therefore, in order to investigate the effect of managerial responses, we divide managerial responses into a managerial apology, which is sent to dissatisfied customers who left negative reviews, vs. a managerial thank you, which is sent to satisfied customers who left positive reviews. Figure 1 shows our research model.

**The effect of managerial apology on customer future satisfaction.** A service process is a set of activities that must function properly for a service to be produced (Edvardsson and Olsson, 1996). In this study, a hotel's service process includes not only service activities provided during customers' stays but also hotel managers' communication efforts to check customers' satisfaction after their stays and resolve their complaints. When experiencing a hotel over multiple stays, consumers evaluate the level of hotel services based on all of those different stays. All stays can possibly be satisfactory, but normally consumers experience alternating between satisfactory and unsatisfactory stays, which constitute the consumers' overall perceptions of a hotel. A managerial apology is a hotel's post-purchase management of the customer experience when the stay was unsatisfactory. Accordingly, it is natural to assume a managerial apology as a part of the service process that determines customers' overall perceptions of the hotel. Consumers will utilize not only stay experiences but also interactions with managers as sources to evaluate hotels. Therefore, a managerial apology is presumed to be perceived as a service provider's care and results in a better experience in the next stay.

Service recovery theory provides a useful underpinning to understand the mechanism by which managerial apology affects customers' future satisfaction. Service recovery refers to a service provider's actions taken when customers encounter a service failure (Khamitov et al., 2020; Smith et al., 1999). While an effective service recovery effort can restore dissatisfied customers' satisfaction even beyond the pre-failure level (i.e., service recovery paradox), a disappointing and wrong effort can decrease satisfaction much further (i.e., double deviations) (Khamitov et al., 2020; Maxham and Netemeyer, 2002; Zou and Migacz,

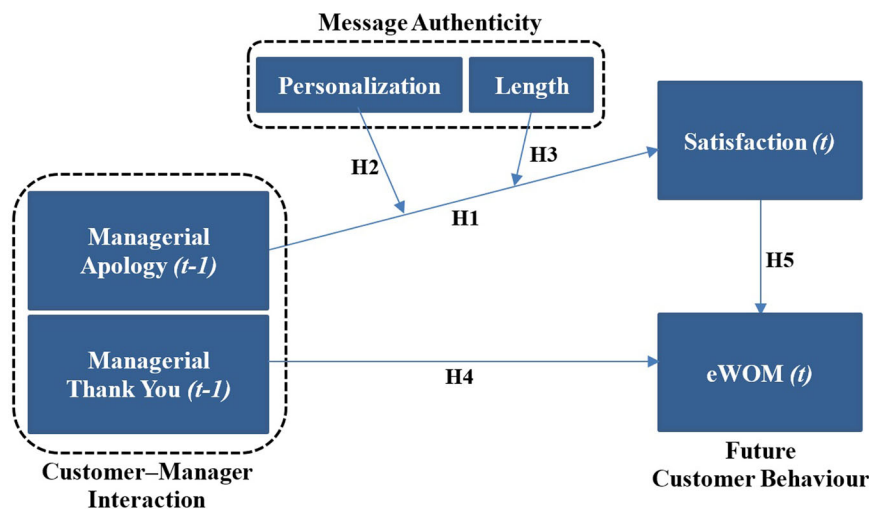


Fig. 1 Research model.

2022). Perceived justice theory offers detailed accounts of the service recovery process (Babin et al, 2021). According to the perceived justice theory, customers do not want their outcome-to-input ratio to be smaller than that of a service provider (Béal, et al., 2022; Van Vaerenbergh et al., 2012). If a customer’s outcome-to-input ratio is smaller than that of a service provider, the customer perceives inequity, which in turn lowers satisfaction (Walster et al., 1973). However, since a customer perceives a service provider’s effort (i.e., managerial apology) to recover customer satisfaction as the service provider’s input, it can decrease the service provider’s outcome-to-input ratio closer to that of the customer, increasing the customer’s justice perception and restoring customer satisfaction (Liao, 2007).

Although the investigated interactions were open communications, several previous studies empirically support the positive effect of managerial response on customer satisfaction (e.g., Proserpio and Zervas, 2017; Ravichandran and Deng, 2022; Sparks et al., 2016). For example, Xie et al. (2016) analyzed data from TripAdvisor and found that a managerial response leads to significant increases in star ratings of the sample hotels. Wang and Chaudhry (2018) analyzed OTA websites, including Expedia and Hotels.com, and found a positive effect of managerial response on subsequent hotel ratings. Some studies revealed specific conditions under which a managerial response may work. From an analysis of data from TripAdvisor and the Chinese travel site Daodao ([www.daodao.com](http://www.daodao.com)), Schuckert et al. (2019) showed the difference between hotel brands; the frequency of a managerial response had a positive effect on satisfaction for domestic Chinese hotel brands, but the effect was limited for international hotel chains. Through an analysis of Chinese OTA website data in which a panel data model was applied, Gu and Ye (2014) revealed that a managerial response is highly effective among low-satisfaction customers than high-satisfaction customers. These last two studies (Gu and Ye, 2014; Schuckert et al., 2019) show that managerial interactions are more effective when customers have low expectations for and are dissatisfied with the hotels, consistent with the mechanism by which a managerial apology plays a positive role. Therefore, we develop the following hypothesis.

**H1** Managerial apology for the review of the previous stay positively impacts customer satisfaction in the next period.

**The moderating effect of message authenticity.** As managerial interaction becomes critical, sending a managerial apology to dissatisfied customers has become a common post-purchase

customer management strategy. As consumers are used to receiving a managerial apology, they become blunted, and a managerial apology may require certain conditions to be effective. We presume that the impact of managerial apology differs according to its authenticity.

A message can convey its meaning well when authenticity is ensured. If the authenticity is doubtful, customers do not rely on the message as an informational cue, and communication performance can be impaired (Boulding and Kirmani, 1993). Authenticity can be more important in digital communication via email, which is underpinned by theories related to computer-mediated communication (Lee, 2020). For example, according to social presence theory, the dearth of nonverbal cues, socio-contextual information, and delayed feedback incurs the inferiority of technology-mediated communication (Short et al., 1976). Though social information processing theory (Walther, 1992) claims that those limitations can be overcome and that intimate interactions accompanying affections are available in technology-mediated communication, it also acknowledges that more time and more messages are required to do so. Therefore, in digital communications, authenticity has been more emphasized (Lee, 2020).

Previous studies empirically showed the importance of message authenticity. For example, Hennig-Thurau et al. (2006) found that inauthentic interactions between service personnel and a customer yield lower satisfaction than authentic interactions do, thereby harming rapport building. Groth et al. (2009) showed that while sincere acting by service employees enhances customer perceptions of service quality, surface acting does not, in both online and offline contexts. Through an experimental study, Labrecque (2014) showed that consumers are not influenced by brands’ responses on social media if they learn that the responses are automated. Likewise, authenticity can play a critical role in managerial apology. By sending a managerial apology, managers try to restore the decreased satisfaction of disgruntled customers. Yet, if a customer feels the apology is inauthentic, it will not be able to convince customers.

The current study recognizes personalization and length as response styles determining authenticity. An automated managerial apology that is identically provided to every customer will be hardly perceived as authentic (Liu et al., 2021). Previous studies support the moderating role of personalization. Through an experimental study, Min et al. (2015) found that customers are more satisfied when the response is paraphrased because it signifies the managers read each review thoroughly and try to

address customer complaints. From an analysis of TripAdvisor data, Zhang et al. (2020) found that personalization strengthens the effect of managerial responses; the content matching between managerial responses and customer reviews increased hotel ratings. Wang and Chaudhry (2018) conducted a topic model analysis by calculating similarity scores between review texts and corresponding managerial responses. Tailoring bolstered the impact of a managerial response by adding specificity. Based on these, the current study expects that dissatisfied customers' future satisfaction will be more strongly impacted by a personalized managerial apology.

**H2** Personalization positively moderates the effect of a managerial apology on the next period's customer satisfaction.

The length is also expected to moderate the effect of a managerial apology (Xu et al., 2020; Xu and Zhao, 2022). An interaction is valuable when it is relevant and informative to listeners (Grice, 1975). A short apology that does not contain enough information is hard to be specific and relevant to each customer's feedback and is likely to be perceived as inauthentic (Chen et al., 2019; Min et al., 2015). From an analysis of a Chinese online travel platform, Liu and Ji (2019) found that the length of a managerial response positively affects customer perception of the helpfulness of managerial responses. People thought wordy responses were more informative and indicative of hotel managers' intentions. Interestingly, Chen et al. (2019) found that responding to dissatisfied customers negatively affects the volume of subsequent other customers' reviews, which contradicts the results of the studies reviewed in the previous section. But, still, in this case, the negative effect was mitigated if the response was long. Therefore, the current study postulates the following hypothesis.

**H3** Response length positively moderates the effect of managerial apology on the next period's customer satisfaction.

**The effect of a managerial thank you on a customer's future eWOM.** As discussed, a managerial thank you sent to customers who have high expectations is not expected to significantly affect satisfaction. Instead, we presume that it drives behavioral changes in terms of eWOM, leading customers to publicly post reviews. For example, a customer, who receives a thank you message from a hotel manager after leaving positive feedback for the previous stay, may not end with just providing positive feedback this time. After learning that the manager actually reads and appreciates her/his feedback, the customer may want to make a good impact on the hotel by sharing their positive experiences with other potential customers.

The positive effect of a managerial thank you on eWOM of satisfied customers is supported by the commitment–trust theory that explains the nature and key characteristics of relationship marketing (Morgan and Hunt, 1994). It proposes commitment and trust as two key factors for relationship marketing to be successful. Commitment is defined as an exchange partner believing that an ongoing relationship is so important as to put maximum effort into maintaining it. When both parties are fully committed to the relationship, they begin to believe it is worth working on to ensure its endurance, and cooperation is one of the key outcomes. In the current research context, satisfied consumers' eWOM can be considered as a cooperation behavior. A managerial thank you manifests managers' extra efforts to maintain a strong relationship with customers, which can strengthen customers' commitment, leading to their cooperative behavior (i.e., eWOM). Indeed, the effect of commitment on positive WOM was empirically demonstrated in previous studies grounded on commitment–trust theory and a relationship marketing framework (e.g., Brown et al., 2005; Li and Chang, 2016).

Previous studies show that eWOM is a function of customer perception of whether a hotel manager cares for and scrutinizes customer feedback by demonstrating that a managerial response affects the volume and valence of online reviews (e.g., Chen et al., 2019; Chevalier et al., 2018; Gong et al., 2022; Proserpio and Zervas, 2017; Sheng et al., 2021). For instance, Proserpio and Zervas (2017) found that after managers responded to reviews on an online platform, the volume of total reviews increased, and the number of negative reviews decreased. Ma et al. (2015) also found that managerial interventions on social platforms encourage customers to voice their opinions. In the study of Chen et al. (2019), though the valence of review contents was not affected by managerial responses, the volume of reviews was significantly increased. These studies show that customers who might otherwise not leave an online review tend to provide their feedback to others if service providers signal that they are listening. Based on these empirical supports of previous findings and the commitment–trust theory, we hypothesize that a managerial thank you increases the eWOM of satisfied customers.

**H4** Managerial thank you for the review of the previous stay positively impacts eWOM in the next period.

**The effect of satisfaction on eWOM.** Extant research has shown that satisfaction is one of the primary antecedents driving customer decisions on whether to engage in WOM activities (e.g., Anderson, 1998; Chevalier and Mayzlin, 2006; Dellarocas and Narayan, 2006; Moe and Schweidel, 2012). According to previous studies, there exists an asymmetric relationship between satisfaction and WOM; negative customers are more likely to share their experiences with others (Anderson, 1998). This negative association is also consistently supported in the online context (Moe and Schweidel, 2012). Prospect theory underpins this phenomenon (Kahneman and Tversky, 1979). The marginal utility that consumers perceive from a negative loss is larger than that from a positive gain, and thus, consumers are more sensitive to a negative loss. Therefore, dissatisfied customers have a greater willingness to share their bad experiences with others. The current study also hypothesizes a negative relationship between satisfaction and eWOM.

**H5** Customer satisfaction decreases eWOM in the same period.

## Methods

**Data.** Data was provided for academic research purposes by an American hotel company that owns one of the largest middle-scale international hotel chains. Our research was conducted in good faith based on mutual agreement between the authors and the data provider company. The company's hotel chain licenses to over 4,700 hotels worldwide, and more than 2,000 hotels among them are located in North America. Our data is part of the company's regular CSS data that was collected by a customer experience management company outsourced by the hotel chain. The data was collected during the period from January 2015 to December 2018, which predates the outbreak of COVID-19. The pandemic has brought significant changes to the hotel industry that could cause unobservable confounding effects on our model. Thus, we constrained our data to the 2015–2018 period, when hotel operations were stable. It consisted of 544,194 customers' 334,538 survey responses toward 515 randomly selected hotels owned by the company. After filtering out the customers who responded to the survey at least twice throughout the data window, 5,058 customers were left, which provides a large enough sample size to guarantee the statistical power of our analysis.

The data contains customers' self-reported satisfaction ratings and text comments about their recent experiences as well as hotel visit information. Once a guest provides an email address when



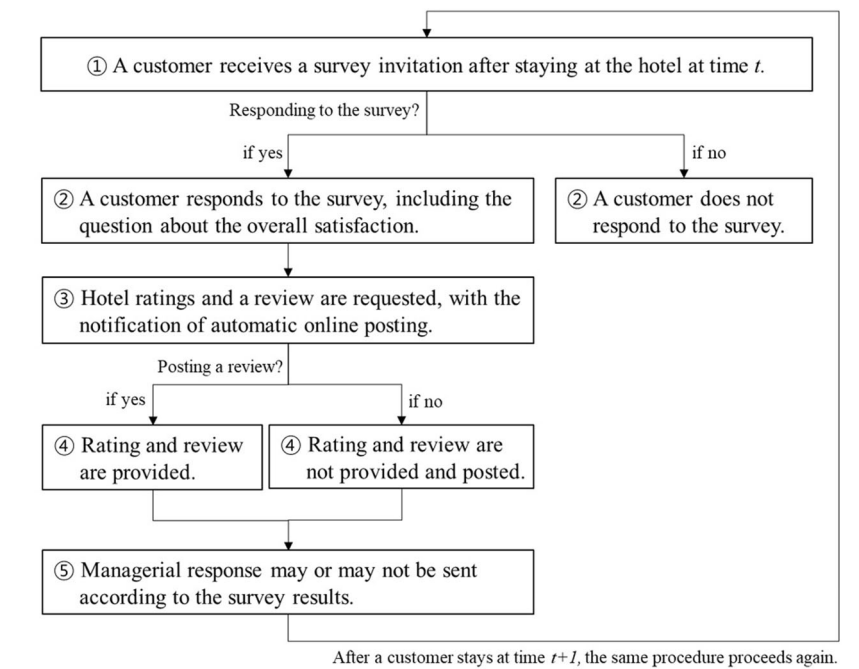


Fig. 2 Research framework.

booking, the hotel automatically sends a survey request by email after the guest checks out. The survey includes questions about their satisfaction level following their stay. Using one item from Oliver’s (1980) study, satisfaction with the overall experience and each of the specific services used are measured. Depending on the number of services that a guest has used (e.g., restaurant service and room service), the guest receives between 15 and 20 questions. All items are measured on a 10-point scale with endpoints of “extremely dissatisfied” and “extremely satisfied.” An even-point Likert scale without a neutral point is widely adopted in the hotel industry’s practical surveys to draw clearer customer insights. Especially, a 10-point scale has the advantage of allowing respondents to select the exact point rather than the nearby point due to a larger spectrum of choices (Joshi et al., 2015). It is also known to show higher validity and explanatory power (Coelho and Esteves, 2007). Five open-ended questions are also included in terms of a general suggestion, a check-in improvement suggestion, a suggestion for the next stay, staff excellence, and any additional opinions. The answers to these open-ended questions are not included in the analysis of this study since they are not the main concerns that are addressed in our model. At the end of the survey, participants are asked to rate the hotel on a 5-point scale and write a review, with a notification that it will be automatically posted on either TripAdvisor or Google’s online review platform. Participants may or may not rate the hotel and write a review, depending on their consent to posting. Figure 2 illustrates the research framework of this study, which shows the process of measuring variables across multiple time periods of interactions between customer feedback and managerial responses. No incentives are given, and customers’ participation in the survey is purely based on their self-motivations.

To trace a guest’s entire history, including hotel booking, satisfaction level revealed in the CSS response, and online review posting behavior over multiple periods, only customers who have an identification link across those data were considered for analysis. As this research focuses on the causal effect of the previous period’s managerial response to the subsequent period’s customer satisfaction and online review posting behavior, all visit information that precedes each customer’s first feedback (i.e., survey participation)

was excluded. The number of customers who posted online reviews at least one time was relatively small compared to that of customers who never posted reviews (posted at least one time = 2529 vs. never posted = 541,665) (see Table 1). To avoid the possible confounding effects caused by the imbalanced customer distribution between two groups (i.e., customers who never posted vs. customers who posted at least one time), we employed the propensity score matching strategy (Rosenbaum and Rubin, 1983). The never-posted customers who resemble the characteristics (i.e., the loyalty level and the number of total bookings) of customers who posted the review at least one time were carefully selected. Through this process, in the final dataset, the number of customers in the two groups was equal.

Finally, the final dataset contained information on 22,682 bookings from 5,058 customers. Eighty-eight percent of these bookings accompanied customers’ survey participation. The survey response rate is higher than in the original dataset because the information prior to the first survey response was excluded. Managers responded to approximately 35% of these survey responses, which is a slightly higher percentage than in the original data (see Table 1).

**Variables**

*Main variables.* First, we divided managerial interactions into a managerial apology and a managerial thank you based on the contents of the managers’ responses. Given that all managers’ responses in our data start with the acknowledgment to the customers by saying thank you, we classified any managerial response that includes the word “sorry,” “apology,” or “apologize” as an apology message (i.e., APOLOGY = 1) and otherwise as a thank you message (i.e., Thank You = 1).

Next, this study has two different models: the satisfaction model and the posting model, which are described in the next section. Overall satisfaction and posting behavior were the dependent variables, respectively, for each model. Among the questions that participants received, for the satisfaction model, we chose the item, “How satisfied were you with the OVERALL experience?” as the key dependent variable. The rationale behind this is: (1) it measures the same general satisfaction of the hotel experience that the online review rating question measures and

(2) this question is the first satisfaction question that customers receive; thus, it can avert the potential measurement bias caused by the question order. For the posting model, we used the binary posting incidence as the dependent variable.

Among the moderating variables, for the length of the response, the standardized actual number of characters of each managerial response was used. For a measure of personalization of managerial responses, we developed a new metric based on the approach of Wang and Chaudhry (2018). Wang and Chaudhry (2018) converted the managerial responses and customer reviews into a numerical topic distribution vector and recognized a manager response that has a high correlation with the customer’s review vector as a highly tailored response. But utilizing the Latent Dirichlet Allocation (LDA) topic distribution as a vector tends to fail to capture the unique information of each comment and ignore the literal attributes in a document (Liu et al., 2021). Therefore, instead, we computed a vector for each customer comment and managerial response using Term Frequency-Inverse Document Frequency (TF-IDF). TF refers to the term (i.e., word) frequency in a document. The higher the frequency of the term, the more chances that the document (i.e., managerial response) is relevant to that term. IDF refers to the inverse of the number of documents in which this term appears. IDF scales down the weight given to words that appear in all documents and increases the weight given to terms appearing in fewer documents. Every word in each customer comment and managerial response can be represented as a value of term frequency divided by document frequency (i.e.,  $\frac{tf}{df}$ ). Since every single word has a value, every customer comment and managerial response is represented as

the same length of a vector, and the distance between each other is calculated based on that. Finally, by adopting the Jensen–Shannon divergence for an inter-document similarity measure (Dagan et al., 1997), the similarity between the customer’s comment and the manager’s response is denoted as follows:

$$\begin{aligned}
 & \text{PersonalScale}_{iht} \\
 &= 1 - \frac{1}{2} \sum_{w=1}^N \text{GC}_{ihtw} (\log \text{GC}_{ihtw} - \log M_{ihtw}) \\
 &+ \sum_{w=1}^N \text{MR}_{ihtw} (\log \text{MR}_{ihtw} - \log M_{ihtw}).
 \end{aligned} \tag{1}$$

$\text{GC}_{ihtw}$  and  $\text{MR}_{ihtw}$  refer to the TF-IDF value for each word  $w$  in the customer comment of customer  $i$  for hotel  $h$  in time  $t$  and its corresponding managerial response, respectively.  $M_{ihtw}$  is the mean of  $\text{GC}_{ihtw}$  and  $\text{MR}_{ihtw}$  (i.e.,  $M_{ihtw} = \frac{\text{GC}_{ihtw} + \text{MR}_{ihtw}}{2}$ ).  $\text{PersonalScale}$  indicates the extent of a manager’s personalizing effort, which ranges from 0 to 1. 0 indicates the lowest level of personalization and 1 is the highest level of personalization. Here, customer comments refer to the text comments provided by customers to the five open-ended questions of the survey. After concatenating the five open-ended comments for each customer, the  $\text{PersonalScale}$  for each managerial response was computed. The examples of managerial responses with the lowest and highest scores on  $\text{PersonalScale}$  are shown in Fig. 3.

*Control variables.* To control for other post-survey managerial interactions that can have a potential impact on customers’ future satisfaction and eWOM, we included two managerial covariates,

**Table 1 Summary statistics for the original vs. analysis data.**

	Original data	Data in our analysis
Number of hotels	515	515
Number of customers	544,194	5058
Number of bookings	1,737,410	22,682
Number of survey responses	334,538	20,012
Number of monetary compensations offers	11,083	723
Number of manager responses to CSS	98,746	7142
Average comment length	65.47 (SD: 157.4)	68.41 (SD: 167.39)
Average response length	695.35 (SD: 168.89)	689.09 (SD: 169.25)
Number of online review postings	2589	2589
Number of customers who posted at least one time	2529	2529
Number of customers who never posted	541,665	2529
Number of manager responses to reviews	308	308
Average $\text{PersonalScale}$	0.05 (SD: 0.17)	0.05 (SD: 0.17)

1) Non-personalized

Dear XXX,

Thank you for completing the survey regarding your recent stay at our property. Your business is very important to us and we value your feedback. By telling us what you liked about your stay and how we can improve, you are helping us deliver a superior experience for you and other guests in the future. We hope you will come back and see us again soon. If I can be of assistance in the future, please don't hesitate to contact me at XXX. Thank you again for taking the time to complete the survey. We appreciate your loyalty to our brand.

2) Personalized

Dear XXX,

Thank you for completing the survey regarding your recent stay at our property. **Firstly, on behalf of our entire team, I would like to express our condolences on the loss of your father. We are sorry for your loss. Secondly, I want to apologize to for the cleanliness issues in your room. It is obvious that we did not clean your room or inspect it the way we should have. The issues you reported should never have been an issue. Your satisfaction is important to us and we will be using the feedback you gave us to implement improvements to ensure we offer a better experience for guests in the future. I hope that you will consider staying with us again so that we can have another chance to provide you with a superior experience. If I can provide any assistance, please don't hesitate to contact me directly at XXX.**

**Fig. 3 Examples of nonpersonalized vs. personalized manager response.** (1) A non-personalized managerial response, with a  $\text{PersonalScale}$  index close to 0, is applicable to any customer feedback. (2) A personalized managerial response, with a  $\text{PersonalScale}$  index close to 1, is specifically tailored to address particular customer feedback.

COMPENSATION and OnlineResponse, in our model. COMPENSATION refers to whether a monetary compensation offer is provided to the customer. If either the manager response or the interaction log data contain at least one of the following words—discount, offer, refund, coupon, or reward—the value of COMPENSATION is 1. OnlineResponse refers to the presence of a public managerial response to a customer’s public online review in the case that the customer chose to post her/his review on online review platforms. We also included customer and booking level covariates to control for the potential effect of a previously developed relationship (Han and Anderson, 2021). The number of prior bookings (NumVisits), the membership level (MembLevel ∈ {Blue, Gold, Platinum, Diamond}), and the number of previously submitted survey responses (NumSurveyResp) were included. Since the length of a managerial response might be correlated with the length of a customer’s comment, we included the standardized number of characters of each customer’s comments (CommentLength). As the effect of the previous managerial response may attenuate over time (Han and Anderson, 2021), the number of days since the most recent day that the customer provided feedback (NumDaysSinceLast) was also included. All control variables were standardized.

**Model.** The main variables that are included in both the satisfaction and posting models are denoted as a matrix  $x$ . They are the following six variables: (1) *ThankYou*: an indicator variable of whether the manager sent a “Thank you” message, (2) *APOLOGY*: an indicator variable of whether the manager response includes an “Apology” message, (3) *ThankYou × PersonalScale*: the extent of personalization of the managerial thank you message, (4) *APOLOGY × PersonalScale*: the extent of personalization of the managerial apology message, (5) *ThankYou × ResponseLength*: the number of characters of the managerial thank you message, and (6) *APOLOGY × ResponseLength*: the number of characters of the managerial apology message.

*The satisfaction model.* Given the discrete and ordered nature of the satisfaction variable, we employed the ordered probit model to capture the categorical nature of the survey-based preference measure, in which a continuous latent preference variable generates observed survey responses. Our model incorporates dynamic features, including the satisfaction reflected in the previously submitted survey and the manager’s response. Customer  $i$ ’s latent satisfaction about hotel  $h$  at time  $t$  is modeled as:

$$\theta_{iht} = \zeta_{ih} + \phi_2\theta_{iht-1} + \beta'_1x_{iht-1} + \omega'_1v_{iht} \quad (2)$$

where  $\zeta_{ih}$  is the baseline satisfaction of customer  $i$  toward hotel  $h$ . This term captures each customer’s heterogeneous preference for the hotel, as every customer has different baseline preferences for different hotels. Following Pudney (2008), we included the continuous latent satisfaction reported in the previous stay ( $t - 1$ ),  $\theta_{iht-1}$ , as an explanatory variable. The term  $\phi_2$  controls for the autocorrelation between the satisfaction at the last survey ( $t - 1$ ) and the satisfaction in the current survey ( $t$ ) of the same customer  $i$  toward the same hotel  $h$ . The term  $\beta'_1$  denotes a vector of regression parameters for matrix  $x_{iht-1}$  that captures the effect of managerial response on future satisfaction. The term  $\omega'_1v_{iht}$  was included to control for the observed heterogeneity. The term  $v_{iht}$  is a vector of covariates that were introduced in the previous section as control variables, which might be correlated with the current satisfaction,  $\theta_{iht}$ . Since the survey ratings were submitted on a 10-point categorical scale, we model the latent satisfaction score,  $\theta_{iht}$ , as follows:

$$P(S_{iht} = s | z_{iht} = 1) = P(\kappa_{s-1} < \theta_{iht} + \epsilon_{1,iht} < \kappa_s) \quad (3)$$

where  $s \in \{1, 2, \dots, 10\}$  is the rating scale. The variable  $S_{iht}$  is the satisfaction rating submitted by customer  $i$ . The  $\kappa_s$  denotes cut points for rating category  $s$ . The term  $\epsilon_{1,iht}$  is the error that follows a standard normal distribution. The condition  $z_{iht} = 1$  indicates that the respondent completed and submitted the survey at her/his  $t$ ’s visit at hotel  $h$ , whereas  $z_{iht} = 0$  indicates that the visited customer ignored the survey.

*The posting model.* In the same manner, we conceptualized a survey respondents’ online review posting decision as a function of a prior interaction with a manager as well as individual and booking specific constructs. The customer  $i$ ’s latent utility  $U_{iht}^*$  of posting an online review for hotel  $h$  at time  $t$  is modeled as

$$U_{iht}^* = \xi_{ih} + \varphi S'_{iht} + \beta'_2x_{iht-1} + \omega'_2v_{iht} \quad (4)$$

The term  $\xi_{ih}$  captures the baseline online review posting propensity for the individual customer  $i$  for hotel  $h$ . The vector  $\beta'_2$  captures the effect of a managerial post-survey interaction. The term  $S'_{iht}$  is a variable that we treat the categorical satisfaction rating,  $S_{iht}$ , as a continuous scale and standardize it.  $\varphi$  is the parameter that estimates the relationship between the standardized current satisfaction and the online review posting incidence. The probability that customer  $i$  submits an online review at the end of the survey is given by the following probit model:

$$Pr(\text{post}_{iht} = 1 | z_{iht} = 1) = \Phi(U_{iht}^* + \epsilon_{2,iht}) \quad (5)$$

where  $\Phi(U_{iht}^* + \epsilon_{2,iht})$  denotes the standard normal cumulative distribution function (c.d.f.). As in the satisfaction model, the term  $\epsilon_{2,iht}$  is an idiosyncratic error following a standard normal distribution. Like the satisfaction model, the condition  $z_{iht} = 1$  indicates that we observe online review posting incidence.

*The selection model.* The selection model is to control for the potential effect of self-selection bias that can be caused by the survey participation decision. Since the satisfaction and posting models rely on attitudes and behaviors that are observed only when the customer completes the survey, a potential self-selection bias may result. If customers’ survey response propensity is correlated to their satisfaction or review posting intention, the observed satisfaction or posting propensity can be biased. A common econometric approach that allows to correct the self-selection bias is Heckman’s two-step selection model (Heckman, 1979). In the first step, we model the survey response tendency using a binary probit model. We model that customer  $i$  responds to the survey that is requested by hotel  $h$  after her/his visit at time  $t$  if

$$Z_{iht'}^* = \gamma_i + \vartheta S'_{iht-1} + \omega'_3v_{iht} > 0 \quad (6)$$

The utility to participate in the survey ( $Z_{iht'}^*$ ) is modeled based on her/his prior satisfaction rating ( $S'_{iht-1}$ ) and the same vector  $v_{iht'}$  comprising the covariates that are used in both the satisfaction and posting models. The probability that customer  $i$  responds to a survey is given by the following probit model:

$$P(z_{iht} = 1) = \Phi(Z_{iht}^* + \epsilon_{3,iht}) \quad (7)$$

where  $\Phi(Z_{iht}^* + \epsilon_{3,iht})$  denotes the c.d.f. and  $\epsilon_{3,iht}$  is an idiosyncratic error term that follows a standard normal distribution. Then, we calculated the inverse Mill’s ratio ( $\widehat{\lambda}_{iht}$ ) for each survey participation using the predicted value from the probit model and included the ratio in both the satisfaction and the posting model as a predictor.  $\widehat{\lambda}_{iht}$  controls the potential self-selection bias resulting from the decision of the survey participation.



**Table 2** Posterior summary of satisfaction and posting models.

Description	Parameters	Satisfaction model: Mean [95%CI]	Parameters	Posting model: Mean [95% CI]
ThankYou <sub>t-1</sub>	$\beta_{1,1}$	0.029 [-0.123, 0.184]	$\beta_{2,1}$	<b>0.434 [0.254, 0.624]</b>
APOLOGY <sub>t-1</sub>	$\beta_{1,2}$	-0.215 [-0.610, 0.176]	$\beta_{2,2}$	0.152 [-0.304, 0.610]
PersonalScale <sub>t-1</sub> × ThankYou <sub>t-1</sub>	$\beta_{1,3}$	-0.054 [-0.305, 0.194]	$\beta_{2,3}$	-0.097 [-0.363, 0.154]
PersonalScale <sub>t-1</sub> × APOLOGY <sub>t-1</sub>	$\beta_{1,4}$	<b>0.384 [0.085, 0.683]</b>	$\beta_{2,4}$	-0.150 [-0.508, 0.190]
ResponseLength <sub>t-1</sub> × ThankYou <sub>t-1</sub>	$\beta_{1,5}$	-0.006 [-0.106, 0.092]	$\beta_{2,5}$	-0.053 [-0.171, 0.055]
ResponseLength <sub>t-1</sub> × APOLOGY <sub>t-1</sub>	$\beta_{1,6}$	<b>0.222 [0.040, 0.404]</b>	$\beta_{2,6}$	-0.035 [-0.251, 0.158]
Current Satisfaction ( $S_t$ )			$\varphi$	<b>-0.070 [-0.119, -0.021]</b>
Selection Bias Adjustment ( $\lambda_{\text{int}}$ )	$\rho_1$	<b>0.188 [0.018, 0.358]</b>	$\rho_2$	0.149 [-0.112, 0.404]

As the posterior distributions of our Bayesian estimates not containing 0 within the 95% confidence interval are considered statistically significant in this research, marked in bold.

## Results

Because of the straightforward interpretation of the standard error and the ease of estimating all three models' parameters simultaneously, we adopted the Bayesian approach. The models were implemented using Stan (Carpenter et al., 2017). We confirmed that the models converge using the potential scale reduction factor (PSRF) (Gelman and Rubin, 1992). The parameter estimates with posterior means, and 95% credible interval (CI) are shown in Table 2.

**The results of the satisfaction model.** The main effect of managerial apology on future satisfaction was not statistically significant, failing to support H1. The effect of PersonalScale<sub>t-1</sub> × APOLOGY<sub>t-1</sub> was significant, supporting H2. It confirmed that if managers apologize for the service failure with a personalized text response, it increases customers' satisfaction in the next period ( $\beta_{1,4} > 0$ ). The marginal effects of a managerial response on satisfaction and posting decision are provided in Table 3, with the standard deviation of each value presented within the parentheses. It shows that when a customer received the maximum level of personalized managerial apology, the probability that the customer rates the hotel as  $S_t = 10$  in the next period increased by about 19.1%. Likewise, if managers apologize to complainants with a lengthy response, the customers' satisfaction significantly increased in the next period ( $\beta_{1,6} > 0$ ), supporting H3. When a customer received a very detailed managerial apology (i.e., 687 characters in our data), the probability that the customer rates the hotel as  $S_t = 10$  in the next period increased by about 27.3%. These results show that a managerial apology is effective only when it is perceived as authentic by being personalized or long.

**The results of the posting model.** The estimate of  $\beta_{2,1}$  in the posting model was significantly positive, confirming that a managerial thank you increases satisfied customers' online review posting tendency in the next period, and thus H4 was supported. A manager's thank you message increased the probability of a customer posting her/his review online by 12.7% (see Table 3). Also, satisfaction and online review posting tendency were negatively correlated ( $\varphi < 0$ ), supporting H5. Dissatisfied customers were more likely to post an online review at the end of the surveys. This result provides an interesting insight together with another result that the estimate of the survey selection bias for the satisfaction model was significantly positive ( $\rho_1 > 0$ ). The customer's survey participation decision was positively related to her/his satisfaction, showing that customers with a high survey participation propensity are more likely to be satisfied customers. These results suggest that when customers share their purchase experiences, while they would like to share negative opinions with other customers, they tend to share positive opinions with the firms that provided services. This finding is consistent with the previous literature asserting that satisfied customers are more

likely to provide feedback to the firm (e.g., Cialdini and James, 2009; Kotler et al., 2007).

## Discussions and implications

**Theoretical implications.** A managerial response is a widely adopted, critical customer management practice in the hotel service industry. We demonstrated the impact of a private managerial response and revealed the moderating effect of message authenticity. This study has fourfold academic implications.

First, this study provides empirical evidence for the effect of private managerial interactions. Although significant attention has been paid to the effects of managerial responses, most previous studies investigate how public managerial interactions change hotel ratings and the valence of eWOM through aggregate-level analyses of data from online review platforms. Informing how potential customers behave when managers respond to other customers' reviews, these studies provide useful information for managing customer complaints and hotel reputation on review platforms. However, they cannot offer firsthand empirical evidence for individual customers' behavioral changes resulting from the customer's direct private interactions. By analyzing data of CSS in which a manager interacts with customers via emails, this study overcomes previous studies' limitations and traces individual customers' behavioral changes. By doing so, this study adds new findings to the existing literature, extending the discussions into the private digital communication context. Many firms typically interact with customers via email, especially at the post-purchase stage, so the effect of private digital communication needs to be examined. Considering that very few studies have done this thus far, this study has distinctive academic value.

Second, this study presents a clear empirical basis to include a managerial response into effective service recovery practices. Based on the expectation confirmation theory, we predicted different mechanisms depending on the previous satisfaction level and examined managerial responses by dividing them into a managerial apology and a managerial thank you. Many previous studies investigated the effect of a manager's response behavior itself without considering the context of interactions, which led to the limitation of not being able to reveal the specific mechanism (i.e., resolving dissatisfaction vs. promoting favorable behavior from satisfaction) in which a managerial response plays a role. By separating the thank you message, we clearly demonstrated the process by which the managerial response resolves dissatisfaction and improves future satisfaction. Our study also has greater academic value in relation to the service recovery theory in that the data from two different periods were analyzed. Service recovery theory assumes an iterative and dynamic relationship between consumers and managers in which post-purchase management practices work. Therefore, to demonstrate the service recovery phenomenon, the process in which a post-



**Table 3 Marginal effects of manager responses.**

	ThankYou <sub>t-1</sub>	APOLOGY <sub>t-1</sub>	PersonalScale <sub>t-1</sub> × ThankYou <sub>t-1</sub>	PersonalScale <sub>t-1</sub> × APOLOGY <sub>t-1</sub>	ResponseLength <sub>t-1</sub> × ThankYou <sub>t-1</sub>	ResponseLength <sub>t-1</sub> × APOLOGY <sub>t-1</sub>
<i>Satisfaction Model</i>						
Pr(s = 1)	0.000 (0.000)	0.000 (0.001)	0.000 (0.000)	-0.000 (0.000)	0.001 (0.008)	-0.000 (0.000)
Pr(s = 2)	0.000 (0.000)	0.000 (0.001)	0.000 (0.000)	-0.000 (0.000)	0.001 (0.003)	-0.000 (0.000)
Pr(s = 3)	0.000 (0.000)	0.001 (0.002)	0.000 (0.000)	-0.000 (0.000)	0.002 (0.007)	-0.000 (0.000)
Pr(s = 4)	0.000 (0.000)	0.003 (0.006)	0.000 (0.001)	-0.000 (0.000)	0.004 (0.014)	-0.000 (0.001)
Pr(s = 5)	0.000 (0.000)	0.003 (0.005)	0.001 (0.001)	-0.001 (0.000)	0.004 (0.011)	-0.001 (0.001)
Pr(s = 6)	-0.000 (0.001)	0.007 (0.010)	0.001 (0.002)	-0.001 (0.001)	0.007 (0.017)	-0.002 (0.001)
Pr(s = 7)	-0.000 (0.003)	0.022 (0.027)	0.005 (0.008)	<b>-0.007 (0.003)</b>	0.018 (0.040)	-0.008 (0.005)
Pr(s = 8)	-0.002 (0.016)	0.070 (0.073)	0.018 (0.033)	<b>-0.041 (0.012)</b>	0.041 (0.098)	<b>-0.052 (0.020)</b>
Pr(s = 9)	-0.012 (0.036)	0.073 (0.071)	0.023 (0.059)	<b>-0.140 (0.051)</b>	0.001 (0.124)	<b>-0.211 (0.047)</b>
Pr(s = 10)	0.015 (0.055)	-0.179 (0.178)	-0.048 (0.102)	<b>0.191 (0.059)</b>	-0.080 (0.276)	<b>0.273 (0.068)</b>
<i>Posting Model</i>						
Pr(post = 1)	<b>0.127 (0.025)</b>	0.044 (0.069)	-0.037 (0.044)	-0.044 (0.058)	-0.149 (0.152)	-0.085 (0.197)

As the posterior distributions of our Bayesian estimates not containing 0 within the 95% confidence interval are considered statistically significant in this research, marked in bold.

purchase interaction improves the next period’s satisfaction should be examined over multiple time periods. However, many previous studies measure this iterative and dynamic process as static while assuming the future customer behavior to be independent of the previous period’s managerial interaction (Van Vaerenbergh et al., 2019). Therefore, direct, empirical evidence for the service recovery process could not be provided. Through a distinctive approach, this research overcomes the limitations of previous studies and greatly contributes to the service recovery research area.

Third, this study offers an understanding of how a post-purchase interaction leads to customers’ favorable patronage behavior. We demonstrated that a managerial thank you increases satisfied customers’ eWOM in the next period. Our result implies that a managerial thank you enhances satisfied customers’ commitment to their relationship with service providers. If satisfied customers receive a thank you message and recognize that managers are scrutinizing their feedback carefully, it will motivate them to post their reviews in the next period. Despite the significant attention given to managerial interactions, confounding results are found in terms of the relationship between managerial responses and eWOM; some studies found a negative relationship (e.g., Chevalier et al., 2018; Ma et al., 2015) while others found a positive one (e.g., Proserpio and Zervas, 2017). This is also mostly due to the analysis in which the context is not considered. By tracing the effect of a thank you message, we showed that managerial interactions have significant effects not only on recovering service failure but also on promoting positive eWOM of satisfied customers. This finding has significant implications in terms of relationship marketing, and it sheds new light on the eWOM literature.

Last, this study provides valuable, specific information in terms of the effective format of online managerial responses. Responding to customers via email is a common strategy used by hotel managers, but an understanding of an effective response style is still lacking. Post-purchase management practices typically use digital communication channels, which lack nonverbal cues and contextual information. The interaction via email is also a non-face-to-face digital communication. Therefore, the content of managerial responses must be composed in the most effective way for managers to achieve their desired effect. We demonstrated the moderation effects of personalization and length, which highlights the authenticity of response messages. This result implies that it is not the managerial apology itself that recovers the service failure but rather the quality of an apology that can give the impression that the manager cares about the customers’ complaints sincerely. Only an authentic apology can be perceived as the service provider’s investment in the relationship in

question and thus can reduce customers’ inequity perception. By revealing the importance of message authenticity in managerial interactions via email, our finding has immense implications in relation to digital communication as well.

**Practical implications.** This research has significant practical implications for hotel management. Based on our findings, the following suggestions are developed. First, hotel managers should actively involve private managerial interactions with customers at the post-purchase stage. As OTAs and online review platforms are becoming important in customers’ hotel choices, hotel managers are actively responding to customer reviews on those OTAs and platforms. However, compared to this, less attention is given to private managerial interactions such as email communication. Many hotels conduct CSS, but managers often send an email response to customer feedback without confidence about its effects. By demonstrating that managers’ email responses to customer feedback is a promising tool for service recovery for disgruntled customers, our findings advance an understanding of private managerial interactions. Although a customer is dissatisfied, if the customer receives a private apology message from a hotel manager, her/his satisfaction can be restored in the next period. Hotel managers should actively interact with their customers not only on online review platforms but also via private communications. This may include checking customer feedback in a timely manner, hiring more employees to respond to customers, offering compensation to unsatisfied customers, etc.

Second, when managers express an apology to customers via email, they need to employ response styles that can deliver a sincere, authentic message. One of the notable findings of this study is that only a personalized or long managerial apology is effective. Just sending an empty apology will be meaningless and of no value as a means of service recovery. Managers sometimes send email responses to customer feedback without clear instructions on how to respond. Therefore, a typical problem that managers suffer from has to do with whether it is worth investing time in personalizing and detailing their responses. Writing a high-quality response requires significant time and effort, which is a capacity constraint problem that service providers encounter from many other resource allocation situations. To solve this problem, it is often outsourced to customer relationship management companies, which help firms handle customer complaints. Though investing a great time in responding to every single survey comment sounds inefficient, our findings show that such effort is rewarding. Dissatisfied customers want a sincere apology, and responding to these customers with a personalized and long message will increase their future satisfaction. If a complaint is not handled

appropriately, customer experience may deteriorate further in the next period, leading to negative eWOM. Considering the detrimental effect of negative reviews, a sincere managerial apology is of great importance for hotel service management.

Third, responding to satisfied customers is of great importance too, as it increases the chance of future eWOM. Therefore, managers should actively communicate with satisfied customers at the post-purchase stage so that customers' satisfaction can be transformed into positive eWOM. As a positive review has a decisive impact on other customers' trust and confidence in choosing a hotel, it is critical. One of our findings is to see more common eWOM in dissatisfied customers. But private managerial thank you can drive behavioral changes of contented customers. Even though customers already have a high satisfaction level, sending a thank you message can further benefit managers by encouraging the customers to voice their positive experiences. Hotel managers need to recognize the importance of email interactions for eCRM. Managerial interactions can reinforce the commitment of managers and satisfied customers to their good relationships, eliciting collaborative behaviors. Managers can express their sincere care for customers, and then, the customers will share their positive experiences with other potential customers as a favorable gesture in return. This mechanism applies to the process of successfully building strong customer relationships.

Last, more investment is required to develop advanced digital CSS systems. In the hotel industry, automation is becoming the mainstream in hotel services, and managers are trying to find appropriate ways to apply new technologies to hotel operations. In line with this effort, an optimized interactive feedback system needs to be developed. In contrast to the traditional customer survey, where the purpose is to measure customer satisfaction and perceptions of hotel services, the recent CSS system allows hotel managers to interact with their customers by sending response emails and also facilitates customers' eWOM by providing a posting option at the end of the survey. These features can be improved with personalizing options to meet consumers who value private and genuine communications. For instance, by applying natural language processing techniques, customer feedback can be analyzed, and the matching right response style might be able to be recommended. Advanced CSS systems with personalizing functions will help hotels not only to improve their values through increased customer satisfaction and online reputation but also to increase revenues through a strengthened relationship with their customers.

### Limitations and future research directions

This study has several limitations that call for further research. First, our sample hotels belong to a single hotel chain brand. While said data is sufficiently large enough to generalize our result, and the hotel chain brand of our data is one of the most popular chains in the world, customer behavior with respect to other hotels, which have different standards of quality or service practices, might differ. In many previous studies in hotel service operations, the hotel segment (i.e., luxury, upper upscale, upscale, and upper midscale) is found to produce different effects (e.g., Ding et al., 2022; Kim et al., 2021). Therefore, future research might be able to consider the differences according to the hotel segment. Second, among the various dimensions of characteristics of email responses, this study examined only personalization and length that determine message authenticity. Other dimensions of a managerial response need to be investigated. For instance, consumers' perception of a manager's response may vary depending on the degree of emotional expressions included, the level of politeness, etc. More attention needs to be paid to specific managerial

response styles that can effectively deliver managers' messages without distortion. Third, while we explicitly accounted for the potential selection biases in our model, the natural experimental design on which this study is based may not be ideal to control all endogeneity. In the future, it might be helpful to consider a longitudinal experiment, which can allow researchers to observe online review posting behavior in a restricted laboratory setting. Fourth, this study did not examine the differences according to the characteristics or situations related to consumers. For example, the degree of dissatisfaction varies from consumer to consumer, and the effect of managerial response may differ depending on the severity of dissatisfaction. If a customer encounters a major service failure, a managerial apology via email may not work for the service recovery process. It is necessary to investigate the moderating effects of severity or the cause of dissatisfaction. Fifth, the moderating effects of different digital communication channels and formats are also worth investigating. Consumers tend to post reviews faster and timelier when using mobile devices (Piccoli and Ott, 2014). Digital communications via mobile are becoming more prevalent, and this is also being applied to the context of managerial interaction. Therefore, it is necessary to understand the differences in managerial interaction via mobile and develop an optimal strategy for it. Lastly, future research may be able to extend the findings of this study by comparing the effect of managerial responses between the pandemic period and before COVID-19. We constrained our data to a stable period unaffected by COVID-19, but the pandemic has significantly changed hotel operations and consumer behavior. The mechanism of service recovery generated by managerial responses, which is one of the main findings of this study, may appear differently during the pandemic (Mazhar et al., 2022). Therefore, future studies could consider this.

### Data availability

The data of this study was provided by an American hotel company that owns one of the largest middle-scale international hotel chains. The company provided its data to this research exclusively for the purpose of academic research only. This research was conducted in good faith based on mutual agreement between the authors and the data provider company. As the data contains information on operations and confidential business information, the name of the company is not disclosed and the data is not publicly available.

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### Competing interests

The authors declare no competing interests.

### Ethical approval

The data of this article was provided by a third-party company. This article does not contain any studies with human participants performed by any of the authors.

### Informed consent

The data of this article was provided by a third-party company. When this company collected the survey data, all participants were provided with a detailed privacy policy, which outlines the participants' rights and the usage of the collected data. All individuals were required to read the policy mandatorily and only individuals who agreed to the policy finally participated in the survey.

### Additional information

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