



Impact of Managerial Responses on Product Sales: Examining the Moderating Role of Competitive Intensity and Market Position

Yinli Huang¹, Yue Jin², Jinghua Huang³

¹Research Center for Contemporary Management, Tsinghua University, China, huangyl.15@sem.tsinghua.edu.cn

²University of International Business and Economics, China, jiny@uibe.edu.cn

³Research Center for Contemporary Management, Tsinghua University, China, huangjh@sem.tsinghua.edu.cn

Abstract

Online review platforms have become very popular in recent years, generating massive numbers of online reviews and thus enticing numerous enterprises to respond to reviews. Although the economic impact (e.g., sales impact) of managerial responses is well recognized, it is unclear whether such an impact is moderated by competitive intensity and market position. This study examines the moderating effects of competitive intensity and market position in the relationship between managerial responses and sales. Using a panel dataset from one of the largest restaurant review platforms in China, this research found that the influence of the volume of managerial responses to positive word-of-mouth (WOM) on sales declined with increasing competitive intensity and decreasing market position. Moreover, we found the volume and degree of personalization of managerial responses to negative WOM to be more important for enterprises with a low market position versus those with a high market position. Our results provide insights into the effectiveness of managerial responses in different environments. We also offer managerial implications to service providers on response strategies.

Keywords: Managerial Responses, Competitive Intensity, Market Position, Product Sales

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1 Introduction

Most online platforms, such as Amazon and Yelp, now provide product reviews. Visitors on Yelp, for example, have written more than 171 million reviews (yelp.com, 2018). Given the popularity of online review platforms, the practice of publicly responding to online reviews has emerged as an important management intervention strategy adopted by many businesses (Proserpio & Zervas, 2017). Because of their public nature, online managerial responses can influence customers who observe reviews and managerial responses to these reviews (Chen et al., 2019; Chung et al., 2020; Gu & Ye, 2014; Huang & Ha, 2020).

Such responses may induce positive effects, such as mitigating the adverse effects of negative word-of-mouth (WOM) (Deng & Ravichandran, 2016; Gunarathne et al., 2017), addressing consumer issues (Lee & Song, 2010), reducing misinformation (Wang & Chaudhry, 2018), and establishing a positive firm image (Proserpio & Zervas, 2017; Xie et al., 2016; Ye et al., 2008). According to a study on the hotel industry by Nerval Corp. (Clarke, 2015), 87% of respondents stated that an appropriate response to a bad review improved their impression of the reviewed hotel and 71% of respondents believe that managerial responses are important. A different survey found that over half of respondents were more likely to book a hotel that had responded to reviews (eMarketer, 2013).

Nevertheless, the effectiveness of managerial responses is likely influenced by consumer trust (Crijns et al., 2017; Wei et al., 2013). Since managers may appear flippant, overzealous, or insincere in their responses (Wang & Chaudhry, 2018), the impact of managerial responses may not always be positive. Furthermore, consumers may consider firm-generated content to be less trustworthy and less credible than user-generated content (Goh et al., 2013; Sparks et al., 2013). Thus, studies should focus on situations in which managerial responses play a positive role.

Because enterprises do not operate in a vacuum and compete on digital platforms (Kumar et al., 2018), each enterprise faces a specific competitive environment and occupies a specific market position. In the marketing and information systems (IS) literature, it has been confirmed that competitive intensity and market position moderate the relationships between firm behaviors and performance (Chauvin & Hirschey, 1993; Kim & Joo, 2013; Liu & Yang, 2009; Melville et al., 2007). Specifically, competitive intensity is defined as the degree to which a firm faces competition in a market (Grewal & Tansuhaj, 2001), and market position refers to a firm's position within its market, as characterized by market share (Hopkins, 1987). While managerial responses certainly represent a type of firm behavior, few studies have investigated whether the positive impact of managerial responses on sales is contingent on competitive intensity and market position. To fill this research gap, the present study focuses on the following research question:

RQ: How do competitive intensity and market position moderate the positive effects of managerial responses to online reviews on sales?

To answer this research question, we collected data from ABC.com, one of the largest restaurant review platforms in China.¹ We consider four aspects of managerial response: volume of managerial responses to positive WOM (MR-P), degree of personalization of MR-P, volume of managerial responses to negative WOM (MR-N), and degree of personalization of MR-N. Since the variables (competitive intensity, market position, managerial response variables) exist on two levels, we adopted multilevel models and obtained the following results. First, high competitive intensity or low market position resulted in a lower positive impact of MR-P volume on sales. Second, the positive effects of MR-N volume and degree of personalization were more evident in sales of enterprises with low market positions compared with those with high market positions. Third, competitive intensity did not affect

the influences of MR-N volume and degree of personalization on sales.

This research offers several contributions. First, we unveil how competitive intensity and market position moderate the effects of managerial responses to online reviews (henceforth, “managerial responses”) on sales, extending the literature on the impact of managerial responses and the moderating effects of competitive intensity and market position. Second, using the persuasion knowledge model (PKM) and its related research as a basis, this study reveals how competitive intensity and market position influence consumer trust in managerial responses, topics that have been ignored by previous studies. Third, we demonstrate that market position influences the effects of different types of managerial responses through different mechanisms. Finally, our findings provide guidance to firms on how to respond to reviews according to competitive intensity and market position.

The rest of the paper is organized as follows. Section 2 reviews the literature on managerial responses and the contingent roles of competitive environment and market position in other management contexts. Section 3 proposes a set of hypotheses on the moderating effects of competitive intensity and market position. Section 4 describes our research methodology and data. Section 5 presents the results, and Section 6 discusses our findings and contributions.

2 Literature Review

2.1 Theoretical Foundation of Managerial Responses

Research on managerial responses can be divided into two streams in terms of research methods. Scholars in the first stream have examined the effectiveness of managerial responses by focusing on different response strategies using experimental methods (Crijns et al., 2017; Dens et al., 2015; Lee & Song, 2010; Marx & Nimmermann, 2017; Mauria & Minazzi, 2013; Sparks et al., 2016; van Noort & Willemsen, 2012; Wei et al., 2013). Several studies have considered two types of response strategies: namely, defensive and accommodative responses. For instance, Lee and Song (2010) incorporated the “no action” strategy into existing defensive-accommodative strategies, demonstrating that accommodative responses lead to better company evaluations than defensive and “no action” strategies. Dens et al. (2015) investigated how service providers should react to different degrees of negative reviews with different response strategies.

¹ The review platform that provided the data has requested anonymity.

Other studies have examined the effect of tailoring responses to reviews (Wei et al., 2013) and have investigated responses framed in past or future actions (Sparks et al., 2016). Studies have also related response strategies to platforms. For example, van Noort and Willemsen (2012) revealed that companies should offer proactive or reactive responses on brand-generated platforms while providing reactive responses on consumer-generated platforms.

In the second stream of research, using secondary data from online platforms such as TripAdvisor, Ctrip, and Yelp, researchers have studied the impacts of various aspects of managerial responses, including whether to respond or not, volume of managerial responses, specific or generic responses, and responses to positive or negative WOM. These impacts either involve consumer reviewing behaviors (Chen et al., 2019; Deng & Ravichandran, 2016; Ma et al., 2015; Proserpio & Zervas, 2017; Wang & Chaudhry, 2018), or focus on firm performance (sales and revenue), which is relevant to this study (Kim et al., 2015; Kumar et al., 2018; Lee et al., 2017; Xie et al., 2017; Xie et al., 2014; Ye et al., 2008). To illustrate, Ye et al. (2008) found that managerial responses greatly impact hotel bookings. Kim et al. (2015) suggested that a higher response rate to negative comments indicates better hotel performance. Xie et al. (2014) and Lee et al. (2017) explored the interaction effects between managerial responses and WOM, and Xie et al. (2017) demonstrated that performance implications of managerial responses depend on hotel class.

Studies investigating managerial responses have explained the role of such responses from various theoretical perspectives. The first perspective is based on the service recovery literature (Dens et al., 2015; Kim et al., 2015; Lee & Song, 2010; Xie et al. 2014), which maintains that organizational responses to negative situations with an action plan for service recovery can soothe dissatisfied customers and prevent further negative consequences (McCullough, 2000; Swanson & Kelley, 2001; Swanson & Hsu, 2011). However, research on service recovery focuses specifically on customers' complaints, whereas managers respond both to negative and positive reviews on online platforms. Therefore, the service recovery literature may fail to fully explain the effects of managerial responses (Lee et al., 2017).

The second perspective is based on the accessibility-diagnostics model (Lee et al., 2017). According to this model, whether consumers use any accessible information for decision-making depends on the diagnosticity of information (Feldman & Lynch, 1988). Specifically, a piece of information is perceived as non-diagnostic if it has multiple interpretations (Herr et al., 1991; Hoch & Deighton, 1989). This model has been adopted by certain studies to explain the effects of online information on firm performance (Chen et al., 2011; Lee et al., 2017).

The third perspective is based on consumer trust (Crijns et al., 2017; Marx & Nimmermann, 2017; Mauria & Minazzi, 2013; Sparks et al., 2016; Wei et al., 2013). Consumers infer trust through their perceptions of firm credibility and integrity, which might be drawn from the source of information made available as a cue (Sparks et al., 2013; Sparks et al., 2016). Information originates from two sources—consumers and firms—and consumers exhibit different degrees of trust toward information from these sources. For instance, consumers often consider reviews by other consumers to be more trustworthy than information provided by companies, presumably because they perceive consumer-generated information to be honest and informative (Sparks et al., 2013). Similarly, Goh et al. (2013) discovered that user-generated content exhibits a stronger impact than marketer-generated content on the purchase behavior of consumers. This result is partially attributed to consumers' perception that marketers might exaggerate benefits while downplaying weaknesses to persuade consumers to make purchases (Goh et al., 2013). Mauria and Minazzi (2013) identified that the presence of hotel managerial responses to reviews exerts a negative impact on purchasing intentions in that managerial responses might be perceived as akin to advertising and considered untrustworthy.

Furthermore, the PKM posits that people actively develop and use persuasion knowledge to cope up with persuasion attempts, rather than passively receiving them (Friestad & Wright, 1994). Conceptually, persuasion knowledge refers to consumers' theories about persuasion and includes beliefs about marketers' motives, strategies, tactics, and ways of coping with persuasion attempts (Campbell & Kirmani, 2000). A persuasion attempt indicates a target's (e.g., a consumer's) perception of an agent's (e.g., a firm's) strategic behavior in presenting information designed to influence beliefs, attitudes, decisions, or actions (Friestad & Wright, 1994). Based on this model, Crijns et al. (2017) argued that managerial responses may activate consumers' persuasion knowledge, allowing consumers to identify whether a firm is seeking to influence or persuade them to achieve goals, which may induce skepticism toward the firm and its responses. In summary, the effectiveness of managerial responses as an important form of firm-generated content is likely influenced by consumer trust (Crijns et al., 2017; Wei et al., 2013).

2.2 Moderating Effects of Competitive Environment and Market Position

We consider two moderating variables: competitive intensity and market position. Theoretically, competitive intensity is an industry-level variable whereas market position is a firm-level variable (Melville et al., 2007; Hopkins, 1987).

Previous studies have analyzed the role of competitive environment in moderating the impacts of firm behaviors such as IT investment and advertising on performance (Kim & Joo, 2013; Melville et al., 2007; Xue et al., 2012). For example, Melville et al. (2004) mentioned that IT is valuable but the extent of its value depends on external factors such as the competitive intensity of the environment. Melville et al. (2007) also explored whether the productivity impact of IT changes according to competitive environment. Based on the X-efficiency hypothesis, Melville et al. (2007) conjectured that the absence of competition leads to inefficiency in using IT. To verify this assumption, they used industry concentration as an inverse proxy for competitiveness and found that the marginal product of IT is low in concentrated (weak competitive intensity) industries. Kim and Joo (2013) found that the positive effects of advertising expenditures are stronger when product market competition is high, also using industry concentration to measure the competitiveness of existing markets. They argued that when the market is crowded with competing products, meaning that consumers have few opportunities to develop brand knowledge, advertising can be effective.

Considerable heterogeneity also exists in the payoffs of marketing activities across firms with different market positions. For example, Chauvin and Hirschey (1993) compared the market value effects of advertising on large-, medium-, and small-sized firms. They observed that advertising effects are most evident with large firms featuring economies of scale or other size advantages. Liu and Yang (2009) also considered market positions of program-offering firms when examining the performance of loyalty programs. They found that large firms benefit more from their loyalty programs than small firms because high-share firms possess considerable customer assets and rich product resources.

2.3 Limitations of Previous Research

Prior research lags in three critical aspects that motivate our study. First, each enterprise is in a specific competitive environment and occupies a specific market position. Most studies implicitly assume that the impacts of managerial responses remain unchanged with competitive intensity and market position. However, this assumption may not hold in all cases. Limited studies on managerial responses have investigated the moderating effects of competitive intensity and market position. Although Kumar et al. (2018) considered competitive intensity, they mainly focused on its direct effects rather than on its moderating effects.

Second, certain studies have demonstrated the moderating roles of competitive intensity and market position in the relationship between firm behaviors and

performance, but few studies explore these moderating effects in the context of managerial responses. Third, although previous research has studied consumer trust in managerial responses, little research has investigated how competitive intensity and market position affect consumer trust in managerial responses.

To fill these research gaps, this study discusses the impacts of managerial responses for firms with different market positions and in environments of different competitive intensity. This research contributes to the extant literature on the impacts of managerial responses. Prior research findings on the impacts of managerial responses are not necessarily consistent for firms with different market positions and in environments of different competitive intensity because competition and market position can affect the outcomes of firm behaviors (Liu & Yang, 2009; Melville et al., 2007). Examining the moderating effects of competitive intensity and market position can shed light on how the influence of managerial responses changes according to competitive intensity and market position. Our research also provides guidance on firm practice. When enterprises make strategic decisions, they often consider the market environment, including competitive intensity and market position. Understanding the moderating roles of these two factors can assist in determining and adjusting response strategies.

3 Hypothesis Development

3.1 Focus Aspects of Managerial Responses

Managerial responses can be divided into MR-P and MR-N. While previous research suggests that MR-P may convey less valuable information to future consumers than does MR-N (Wang & Chaudhry, 2018), we note that firms make great efforts to respond to positive reviews in practice. Closer scrutiny of our data reveals that managers respond to positive reviews more often than negative reviews (both in terms of quantity and percentage), perhaps using their responses as an opportunity to express gratitude, highlight positive aspects of the firm, or show care (tripadvisor.com, 2016).

One possible explanation for this inconsistency between research and practice might be that the effect of MR-P may vary in different scenarios, a possibility that previous studies have overlooked. By generating an understanding of whether and when MR-P are valuable, we can provide further guidance to firms on response strategies. Therefore, we consider two situational factors: competitive intensity and market position. We discuss the moderating effects of these two factors for both MR-P and MR-N.

Empirical research has devoted increasing attention to the volume and degree of personalization of managerial responses (Deng & Ravichandran, 2016; Lee et al., 2017; Wang & Chaudhry, 2018; Xie et al., 2017; Xie et al., 2014). Specifically, personalization involves the practice of customizing MR to the contents of the corresponding review and targeting each detail regarding praise, criticism, requests, and suggestions from each customer (Deng & Ravichandran, 2016; Wang & Chaudhry, 2018). The volume and degree of personalization reflect the level of effort devoted by a firm to composing responses. Volume reveals the firms' effort to respond to more customers, whereas degree of personalization demonstrates the firms' effort to make these responses better by personalizing them. Thus, we focus on both the volume and degree of personalization of MR-P and MR-N in this study. Consumers may exhibit varied perceptions and attitudes toward different types of managerial responses (Deng & Ravichandran, 2016; Wang & Chaudhry, 2018; Wei et al., 2013), meaning that competitive intensity and market position may differently affect the performance influences of various types of managerial response.

3.2 Managerial Responses and Competitive Intensity

Competitive intensity may affect consumer trust in managerial responses; specifically, fiercer competition may lead to lower trust in managerial responses (Campbell & Kirmani, 2000; Friestad & Wright, 1994; Vonk, 1998) since consumers may regard such responses as persuasion attempts. Furthermore, according to the PKM, consumers can use persuasion knowledge to interpret, evaluate, and cope with managerial responses (Crijns et al., 2017; Friestad & Wright, 1994). To interpret managerial responses, consumers first draw correspondent inferences about the responses (e.g., firms are sincere and will improve their products) and then use persuasion knowledge to correct the correspondent inference on the basis of an inference about a firm's ulterior motives (Campbell & Kirmani, 2000; Vonk, 1998). If consumers are suspicious of a firm's motives, they may perceive the firm to be "slimy," manipulative, or insincere, resulting in distrust and disfavor toward the firm (Campbell & Kirmani, 2000; Fein et al., 1990; Vonk, 1998).

The interpretation of managerial responses is affected by perceptions regarding firms' dependence on consumers (Brown, 1990). If firms are highly dependent on consumers for positive outcomes, consumers will be more likely to attribute managerial responses to firms' ulterior motives and to interpret managerial responses as ingratiation (Brown, 1990; Campbell & Kirmani, 2000; Vonk, 1998). In highly competitive markets, consumers enjoy a dominant position and firms are highly dependent on consumers. Thus, firms are likely to be suspected of possessing ulterior motives and may be perceived as ingratiating and insincere by consumers. Consequently, consumer trust in firms and managerial responses is decreased, and the positive effects of managerial responses may be weakened.

In terms of different types of managerial responses, more intense competition suggests a lower positive impact of MR-P volume on sales. Although consumers may draw a direct correspondent inference that managers are expressing gratitude in MR-P (Campbell & Kirmani, 2000), they may also question why firms are investing time in consumers who are already satisfied and not explicitly asking for a response (Campbell & Kirmani, 2000; Crijns et al., 2017), leading to MR-P being perceived as disingenuous and manipulated (Wang & Chaudhry, 2018). For instance, regarding the response in Example 1 (Figure 1) some consumers may interpret the MR-P as appreciation, whereas others may suspect ulterior motives and interpret the response as firm promotion. If consumers interpret MR-P as appreciation, increasing the volume of MR-P can have a positive impact; however, it may exert minimal positive effects on purchase decisions if consumers suspect ulterior motives are at play. The likelihood of suspicion can be affected by competitive intensity. As discussed above, fiercer competition indicates more dependence of firms on consumers, which makes consumers be more likely to suspect firms of having ulterior motives (Brown, 1990; Campbell & Kirmani, 2000; Vonk, 1998). As a result, consumers are inclined to distrust MR-P in a highly competitive environment. Thus, increasing the volume of MR-P may be ineffective in a highly competitive environment. Thus, we hypothesize that

H1: The positive impact of MR-P volume on sales is lower in the presence of stronger competition.

Review: The pearl milk tea was really delicious. It was a super super cup. Love it!

Response: Please come back again. We will be launching a lot of new fruit drinks soon.

Figure 1. Example 1: MR-P

Review: Pretty good. I often come here to eat the working meal.

Response: The working meal is cheap. It's a good choice for office workers. I hope you can come to our restaurant often.

Figure 2. Example 2: MR-P with a High Degree of Personalization

More intense competition also correlates with a lower positive impact of highly personalized MR-P for similar reasons. First, while consumers may draw the direct correspondent inference that firms' personalized responses to positive WOM express care and concern about what consumers say in reviews (Campbell & Kirmani, 2000), they may alternatively suspect ulterior motives because firms are investing time and effort in satisfied consumers not expecting a response (Campbell & Kirmani, 2000; Crijns et al., 2017).

As exemplified in Figure 2, highly personalized MR-P may involve highlighting the content (especially the positive aspects) mentioned by consumers or self-promoting according to the consumer's preferences expressed in the review. With highly personalized MR-P, some consumers may feel that they are being heard by firms, whereas others may interpret the response as self-promotion. Highly personalized MR-P will be more effective if consumers feel that managers are showing care rather than simply promoting the firm. Since, as discussed above, in highly competitive environments, firms are more dependent on consumers, such consumers in highly competitive environments will be more likely to suspect ulterior motives and have lower levels of trust in MR-P of all types. Thus, we expect that enhancing the degree of MR-P personalization will have less of an impact on consumers' purchase decisions in highly competitive environments. Hence, we hypothesize that

H2: The positive impact of MR-P personalization on sales is lower in the presence of stronger competition.

In comparison to MR-P volume, the effect of MR-N volume would be expected to be impacted less by competitive intensity. Compared to MR-P, MR-N may have a stronger positive influence on consumers' purchase decisions when competition is strong. Previous studies have found that consumers are likely to voice their complaints to draw attention from companies, influence managers, enforce redress, and request a response (Chevalier et al., 2018; Ma et al., 2015; Willemsen et al., 2013). In contrast to MR-P, which consumers are likely to view with suspicion in highly competitive environments, consumers would likely expect enterprises to respond to negative WOM

to alleviate its harmful effects, especially if a reviewer requested a response (Chung et al., 2020; Crijns et al., 2017; Willemsen et al., 2013). As seen in Figure 3, MR-N signal that firms are paying attention to consumer complaints. According to the service recovery literature, MR-N can improve consumers' satisfaction and trust through articulating service recovery actions or plans (Dens et al., 2015; DeWitt et al., 2008; McColl-Kennedy & Sparks, 2003). Hence, compared with MR-P, we expect consumers observing MR-N to be less likely to suspect ulterior motives because MR-N may fulfill consumers' response requests and are more likely to present information that is valuable and meaningful to consumers (Wang & Chaudhry, 2018). In highly competitive environments, we expect that increasing the volume of MR-N, which demonstrates the firms' efforts to respond to as many consumer complaints as possible, will exert a larger positive effect on consumers' purchase decisions than increasing the volume of MR-P. We therefore hypothesize that

H3: The moderating effect of competitive intensity in the relationship between MR-N volume and sales is lower than that between MR-P volume and sales.

Compared to MR-P personalization, the effect of MR-N personalization would be expected to be less impacted by competitive intensity. In contexts of fierce competition, personalization of MR-N may exert a greater positive influence on consumers' purchase decisions than personalization of MR-P. In contrast to MR-P, which consumers may regard with suspicion in highly competitive environments, consumers will likely regard firm responses to negative WOM as reasonable behavior because complaining consumers are seeking firm attention and may have even requested a response (Ma et al., 2015; Willemsen et al., 2013). Enhancing the personalization of MR-N demonstrates the firms' efforts to respond to consumer complaints as adequately as possible. As shown in Figure 4, an MR-N response with a high degree of personalization involves restating the problems, providing relevant explanations, or addressing specific issues. Personalized MR-N can provide relevant information describing how consumers' concerns have been addressed (Xie et al., 2017).

Review: The meat tasted bad.

Response: Thank you for coming to our restaurant and giving valuable feedback. We will be sure to carefully check the quality of our meat and work harder. Looking forward to your next visit!

Figure 3. Example 3: MR-N

Review: When I arrived at the restaurant, the waiter said that there was no kebab. Is it a kebab restaurant if it doesn't sell kebab?

Response: I'm sorry. Maybe the staff didn't make it clear to you. We weren't done preparing the kebabs when you arrived. But kebabs are available at other times.

Figure 4. Example 4: MR-N with a High Degree of Personalization

Hence, although intense competition may reduce consumer trust in managerial responses in general (Brown, 1990; Campbell & Kirmani, 2000; Friestad & Wright, 1994; Vonk, 1998), consumers are less likely to suspect ulterior motives in the context of personalized MR-N versus personalized MR-P because personalized MR-N can satisfy consumers' demand for a firm response and may convey valuable information to consumers (Crijns et al., 2017; Xie et al., 2017). Therefore, we expect the effect of MR-N personalization on consumers' purchase decisions to be less influenced by competitive intensity than MR-P personalization, and hypothesize that

H4: The moderating effect of competitive intensity in the relationship between MR-N personalization and sales is lower than that between MR-P personalization and sales.

3.3 Managerial Responses and Market Position

Two different viewpoints are considered for the influence of market position on the effectiveness of managerial responses. First, market position may affect consumer trust in managerial responses. As discussed above, when firms are more dependent on consumers to achieve positive outcomes, consumers are more likely to attribute managerial responses to ulterior motives and interpret managerial responses as ingratiation (Brown, 1990; Campbell & Kirmani, 2000; Vonk, 1998). For enterprises with a low market position, they are highly dependent on consumers; and consumers are more likely to suspect their managerial responses to be ingratiating and insincere. Thus, consumer trust in such enterprises and their responses may decrease, and the positive effects of managerial responses may diminish.

Second, market position may influence information diagnosticity. The accessibility-diagnosticity model states that consumers use a piece of information as input for judgments and decisions when they perceive such information to be diagnostic (Feldman & Lynch, 1988). Specifically, a piece of information is perceived as diagnostic if it has a single interpretation and helps consumers assign a product to a unique category (Herr et al., 1991; Hoch & Deighton, 1989). Accordingly, a high market position is more diagnostic than a low market position. To illustrate, a low market position can be caused by either low product quality or narrow product positioning; by contrast, a high market position can be achieved only if the product is of high quality and matches most of consumers' preferences (Chen et al., 2011). Therefore, a single interpretation explains the high market position, and a high market position is relatively diagnostic. When consumers possess adequate diagnostic information (i.e., high market position), managerial responses may not be needed. That is, for enterprises with a high market position, managerial responses likely have minimal impact on consumers' purchase decisions. Conversely, for enterprises with a low market position, consumers demand additional information, such as managerial responses, to make purchase decisions, given the non-diagnosticity of the low market position.

In terms of the different types of managerial response, a lower market position likely correlates with little positive influence of MR-P volume on sales. From the perspective of consumer trust, although consumers reading MR-P may draw a direct inference that managers are expressing gratitude, they may also suspect ulterior motives, given that firms are investing time in satisfied consumers not seeking a response (Campbell & Kirmani, 2000; Crijns et al., 2017), in which case, MR-P may be interpreted as a

disingenuous and manipulated promotional activity (Wang & Chaudhry, 2018). The likelihood of suspicion may be affected by market position. Enterprises with a lower market position are more dependent on consumers and are thus more likely to be suspected of having ulterior motives when consumers read MR-P, resulting in distrust in the MR-P (Brown, 1990; Campbell & Kirmani, 2000; Friestad & Wright, 1994; Vonk, 1998). Therefore, increasing MR-P volume may be of little value for firms with a low market position.

From the perspective of information diagnosticity, although consumers require further information to make purchase decisions for enterprises with a low market position, MR-P may not serve as a reliable basis for their decisions because such responses may not be trusted by consumers in contexts of low market position (Brown, 1990; Campbell & Kirmani, 2000; Vonk, 1998; Wang & Chaudhry, 2018). In sum, we expect that the moderating effect of market position on the influence of MR-P is mainly based on affecting consumer trust rather than influencing information diagnosticity. Hence, we anticipate that the positive effect of MR-P volume on consumers' purchase decisions diminishes as market position decreases, and hypothesize that

H5: The positive influence of MR-P volume on sales is weaker when market position is lower.

A lower market position likely also correlates with little positive influence of MR-P personalization on sales. From the perspective of consumer trust, while consumers observing firms responding in a personalized manner to positive WOM may draw the direct inference that managers are showing care about what consumers say in the review, they may also suspect ulterior motives because firms are devoting effort to consumers who are satisfied and not requesting a response (Campbell & Kirmani, 2000; Crijns et al., 2017). Market position may influence the likelihood of suspicion. Consumers tend to suspect that enterprises with a low market position have ulterior motives for their managerial responses (Brown, 1990; Campbell & Kirmani, 2000; Friestad & Wright, 1994; Vonk, 1998). That is, personalized MR-P may activate consumer skepticism when market position is low. Therefore, enhancing the personalization of MR-P will likely be ineffective for firms with a low market position.

From the perspective of information diagnosticity, consumers demand more information to make purchase decisions for enterprises with a lower market position (Chen et al., 2011; Feldman & Lynch, 1988; Lee et al., 2017). However, enhancing the personalization of MR-P is unlikely to facilitate decision-making in this context because personalized MR-P may be distrusted by consumers when market

position is low (Brown, 1990; Campbell & Kirmani, 2000; Crijns et al., 2017; Vonk, 1998). In sum, we expect that the moderating effect of market position on the influence of MR-P personalization is mainly based on impacting consumer trust rather than influencing information diagnosticity. Hence, we anticipate that the positive effect of MR-P personalization on consumers' purchase decisions decreases as market position declines, and hypothesize that:

H6: The positive influence of MR-P personalization on sales is weaker when market the position is lower.

Compared to MR-P volume, a lower firm market position is likely associated with a more significantly positive influence of MR-N volume on sales. From the perspective of consumer trust, as discussed above, consumers are more trusting of MR-N than MR-P because MR-N can fulfill consumers' needs for responses and may provide meaningful information for consumers. Since market position has a weak influence on consumer trust of MR-N, MR-N should remain effective for enterprises with a low market position. From the perspective of information diagnosticity, because of the non-diagnosticity of the low market position, more information is necessary for making purchase decisions regarding enterprises with a low market position (Chen et al., 2011; Feldman & Lynch, 1988; Lee et al., 2017). Increasing the volume of MR-N can give consumers more information about such firms and facilitate their decision-making. By contrast, a high market position is relatively diagnostic and can be regarded as input for judgments and decisions. Thus, other information, such as MR-N, may exert minimal influence on consumers' decisions regarding firms with a high market position if they consider high market position sufficiently diagnostic for decision-making. In sum, we expect the moderating effect of market position on the influence of MR-N volume to be mainly enacted through affecting information diagnosticity rather than influencing consumer trust. Hence, we anticipate that the effect of MR-N volume on consumers' purchase decisions is greater for enterprises with lower market position, and hypothesize that:

H7: The positive influence of MR-N volume on sales is stronger when market position is lower.

Similar to MR-N volume, a lower firm market position would be expected to correlate with a greater positive influence of MR-N personalization on sales. From the perspective of consumer trust, as discussed above, consumers are more trusting of personalized MR-N than personalized MR-P. Since the market position exerts a weak influence on consumer trust in personalized MR-N, enhancing the personalization of MR-N is likely to be effective for enterprises with a low market position. From the perspective of

information diagnosticity, because of the non-diagnosticity of the low market position, consumers need more information to make purchase decisions for enterprises with a low market position (Chen et al., 2011; Feldman & Lynch, 1988; Lee et al., 2017). Increasing the degree of personalization of MR-N can offer more relevant and specific information to consumers and facilitate their decision-making (Xie et al., 2017). By contrast, enhancing the personalization of MR-N may exhibit minimal influence on consumers' decisions regarding enterprises with high market positions when a high market position is diagnostic enough for consumers to make decisions. Therefore, we expect the moderating effect of market position on the influence of MR-N personalization to be mainly affected through impacting information diagnosticity rather than influencing consumer trust. Hence, the effect of MR-N personalization on consumers' purchase decisions is larger for enterprises with lower market positions. We thus hypothesize that

H8: The positive influence of MR-N personalization on sales is stronger when market position is lower.

4 Research Methodology

4.1 Research Context

We selected the module of restaurant services in ABC.com as the research context because users are active in this module, generating a large number of reviews and corresponding managerial responses. Furthermore, the restaurant service module requires high levels of involvement; consumers often spend a considerable amount of time searching for information about restaurants, including managerial responses, before making decisions (Gu et al., 2012; Lu et al., 2013). Several consumers in our dataset mentioned in their reviews that they browsed managerial responses online before purchasing. For example, one consumer commented: "I thought the restaurant might be good before I went to it, because I noticed that it always responds to consumer reviews diligently."

We identify the industry encountered by each enterprise because we use industry concentration to measure the competitive intensity of existing industries. Bain (1951) defined industry as a group of outputs which to all (or most) buyers of each are generally close substitutes for each other and distant substitutes for all other outputs. He also argues that geographical segmentation should be considered when measuring substitutability. For geographically constrained products, such as restaurant services, the same kind of products in different regions are less substitutable because consumers must consider transport costs. The classification of industries developed in *The Structure of the American Economy*

(Means, 1939) also considers geographical segmentation, which segregates industries into those having "national," "regional," and "local" markets. In our research context, restaurants can only serve local consumers and restaurant services in different business districts show poor substitutability. Therefore, we operationalized industry as the business district where the restaurant was located. In general, competitive environment varies from one business district to another. Moreover, in practice, restaurants in the same business district are listed together on ABC.com.

The daily panel data originated from restaurants in the two largest administrative districts in Beijing. The data include sales, reviews, and managerial responses of these restaurants. A few restaurants set very low prices and did not sell actual products during the trial operation stage. Thus, we deleted their observations during the trial operation stage as well as those with missing values. The total dataset included 515,183 observations involving 8,098 restaurants, covering 78 business districts from April 2016 to June 2016.

4.2 Empirical Model Specification

Figure 5 depicts the research model. The variables related to the business district (competitive intensity) were categorized as Level 2 variables; those related to restaurants—i.e., variables regarding managerial responses, market position, and sales—were categorized as Level 1 variables. As restaurants located in the same business district may present unobservable characteristics in common, the error terms could correlate with each other if error terms are only considered at the restaurant level (Luke, 2004). Thus, we used multilevel models, also known as mixed-effect models, to avoid this issue (de Leeuw et al., 2008; Luke, 2004). In multilevel models, Level 2 variables may affect those at Level 1 as well as the relationships among them.

On the basis of the research model, we set up the following econometric models. First, we started with the models at Levels 1 and 2.

Restaurant level (Level 1):

$$\begin{aligned} \ln(\text{Sales}_{ijt}) = & \alpha_{0i} + \alpha_{1i}\text{RepPVol}_{ijt-1} + \\ & \alpha_{2i}\text{RepNVol}_{ijt-1} + \alpha_{3i}\text{RepPPer}_{ijt-1} + \\ & \alpha_{4i}\text{RepNPer}_{ijt-1} + \alpha_5\text{Mr}_{ijt-1} + \\ & \alpha_6\text{Mr}_{ijt-1} * \text{RepPVol}_{ijt-1} + \alpha_7\text{Mr}_{ijt-1} * \\ & \text{RepNVol}_{ijt-1} + \\ & \alpha_8\text{Mr}_{ijt-1} * \text{RepPPer}_{ijt-1} + \alpha_9\text{Mr}_{ijt-1} * \\ & \text{RepNPer}_{ijt-1} + \\ & \alpha_{10}\text{Val}_{ijt-1} + \alpha_{11}\text{Vol}_{ijt-1} + \alpha_{12}\text{Var}_{ijt-1} \\ & + \alpha_{13}\text{Price}_{ijt} + \alpha_{14}\text{Shopnum}_{ijt} + \\ & \alpha_{15}\text{Popularity}_{ijt} + \alpha_{16}\text{Tenure}_{ijt} + \\ & \alpha_{17}\text{Openhour}_{ijt} + \alpha_{18}\text{Time dummy}_{ijt} + \\ & \mu_{ij} + \varepsilon_{ijt} \end{aligned} \quad (1)$$

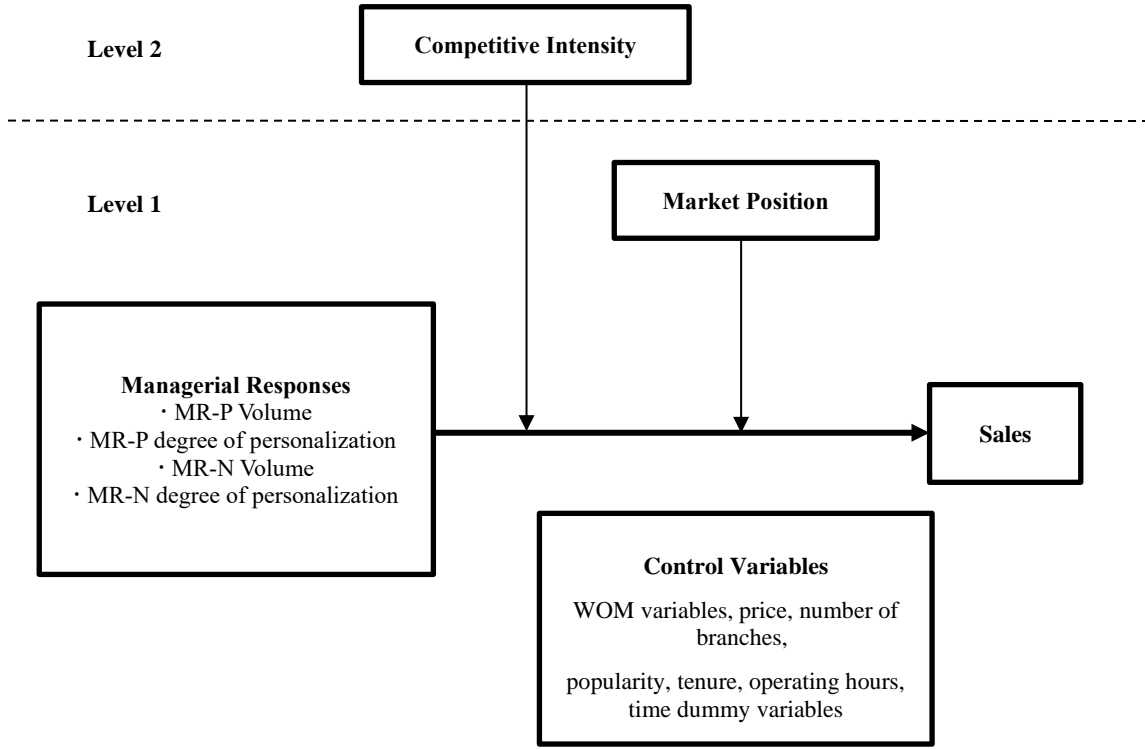


Figure 5. Research Model

Business district level (Level 2):

($\alpha_{0i} - \alpha_{4i}$ vary with business districts and are affected by competitive intensity)

$$\alpha_{0i} = \gamma_{00} + \gamma_{01}Cr4_{ijt-1} + \mu_{0i} \quad (2)$$

$$\alpha_{1i} = \gamma_{10} + \gamma_{11}Cr4_{ijt-1} + \mu_{1i} \quad (3)$$

$$\alpha_{2i} = \gamma_{20} + \gamma_{21}Cr4_{ijt-1} + \mu_{2i} \quad (4)$$

$$\alpha_{3i} = \gamma_{30} + \gamma_{31}Cr4_{ijt-1} + \mu_{3i} \quad (5)$$

$$\alpha_{4i} = \gamma_{40} + \gamma_{41}Cr4_{ijt-1} + \mu_{4i} \quad (6)$$

Then, we substituted the Level 2 equations into Equation (1). For simplicity, we unified coefficient symbols by using symbol β . Finally, we reached Equation (7) after rearranging.

$$\begin{aligned} \ln(\text{Sales}_{ijt}) = & \beta_0 + \beta_1 \text{RepPVol}_{ijt-1} + \\ & \beta_2 \text{RepNVol}_{ijt-1} + \beta_3 \text{RepPPER}_{ijt-1} \\ & + \beta_4 \text{RepNPer}_{ijt-1} + \beta_5 Cr4_{ijt-1} + \\ & \beta_6 Mr_{ijt-1} + \\ & \beta_7 Cr4_{ijt-1} * \text{RepPVol}_{ijt-1} \\ & + \beta_8 Cr4_{ijt-1} * \text{RepNVol}_{ijt-1} + \\ & \beta_9 Cr4_{ijt-1} * \text{RepPPER}_{ijt-1} + \beta_{10} Cr4_{ijt-1} * \\ & \text{RepNPer}_{ijt-1} + \\ & \beta_{11} Mr_{ijt-1} * \text{RepPVol}_{ijt-1} + \beta_{12} Mr_{ijt-1} * \\ & \text{RepNVol}_{ijt-1} + \\ & \beta_{13} Mr_{ijt-1} * \text{RepPPER}_{ijt-1} + \\ & \beta_{14} Mr_{ijt-1} * \text{RepNPer}_{ijt-1} + \beta_{15} Val_{ijt-1} \\ & + \beta_{16} Vol_{ijt-1} + \beta_{17} Var_{ijt-1} + \beta_{18} Price_{ijt} \\ & + \beta_{19} Shopnum_{ijt} + \beta_{20} Popularity_{ijt} + \\ & \beta_{21} Tenure_{ijt} + \beta_{22} Openhour_{ijt} + \end{aligned} \quad (7)$$

$$\begin{aligned} & \beta_{23} \text{Time dummy}_{ijt} + \mu_{1i} \text{RepPVol}_{ijt-1} + \\ & \mu_{2i} \text{RepNVol}_{ijt-1} + \mu_{3i} \text{RepPPER}_{ijt-1} + \\ & \mu_{4i} \text{RepNPer}_{ijt-1} + \mu_{0i} + \mu_{ij} + \varepsilon_{ijt} \end{aligned}$$

Let i denote each business district, ij denote restaurant j in business district i , and t denote each time period (daily).

Table 1 presents the description and operationalization of the key variables. The dependent variable was the daily online sales of the restaurant. The sales were log-transformed according to prior literature (Chevalier & Mayzlin, 2006; Lu et al., 2013).

RepPVol, *RepNVol*, *RepPPER*, and *RepNPer* are variables related to managerial responses. *RepPVol* and *RepNVol* denote the volumes of MR-P and MR-N, respectively. On ABC.com, consumers rate the restaurant on a 1-5 rating scale of poor, ordinary, good, excellent, and outstanding. Thus, reviews with a rating of less than three stars were identified as negative WOM and reviews with a rating of three or more stars were considered positive WOM. *RepPPER* and *RepNPer* are the average degree of personalization of MR-P and MR-N for each firm, with a higher average degree of personalization indicating more personalized responses. We employed the textual analysis methods introduced by Wang and Chaudhry (2018) and Deng and Ravichandran (2016) to calculate the degree of personalization for every managerial response.

Table 1. Variable Description and Operationalization

Variable	Description	Operationalization
<i>Sales</i>	Sales of restaurants	Daily online sales of restaurants
<i>RepPVol</i>	Volume of MR-P	Number of managerial responses to reviews with a rating not less than three stars
<i>RepNVol</i>	Volume of MR-N	Number of managerial responses to reviews with a rating less than three stars
<i>RepPPer</i>	Average degree of personalization of MR-P of each firm	We used topic probabilities to calculate a cosine similarity score between each pair of positive review and corresponding response. Then, we took the average.
<i>RepNPer</i>	Average degree of personalization of MR-N of each firm	We used topic probabilities to calculate a cosine similarity score between each pair of negative review and corresponding response. Then, we took the average.
<i>Cr4</i>	Four-firm concentration ratio	Total sales of the four largest firms/total sales in served business districts
<i>Mr</i>	Market share	Sales of restaurants/total sales in served business districts

First, we applied latent Dirichlet allocation to obtain a mixture of topic distributions and assigned topic probabilities to each review and response. Then, we used these probabilities to calculate a cosine similarity score between each pair of review and response as specified in Equation (8), where *rev* and *res* were the topic probability vectors of each review and its corresponding response, respectively (Wang & Chaudhry, 2018). The cosine similarity score served as proxy for the degree of personalization of each managerial response. A higher degree of similarity indicates a stronger degree of personalization. Finally, we averaged the degree of personalization of MR-P and MR-N of each firm to obtain *RepPPer* and *RepNPer*, respectively.

$$\text{similarity} = \frac{\sum_{i=1}^n \text{rev}_i * \text{rep}_i}{\sqrt{\sum_{i=1}^n (\text{rev}_i)^2} * \sqrt{\sum_{i=1}^n (\text{rep}_i)^2}} \quad (8)$$

Cr4 denotes a four-firm concentration ratio indicating the degree to which the four largest firms dominate the market. The four-firm concentration ratio is commonly used as a measurement for industry concentration, which is an inverse proxy for the competitive intensity of an industry (Kim & Joo, 2013; Melville et al., 2007). *Mr* denotes market share, reflecting the market position of firms (Liu & Yang, 2009). As we only considered the restaurant industry, we adopted the absolute market share (the ratio of a firm's sales to total sales in the served market) (Szymanski et al., 1993).

We considered *RepPVol*, *RepNVol*, *RepPPer*, *RepNPer*, *Cr4*, and *Mr* in the previous time period (*t-1*) to avoid simultaneity issues (Goh et al., 2013). Moreover, we mean-centered these variables to alleviate multicollinearity concerns. Several control variables were included in the model. *Val*, *Vol*, and *Var* represent the valence, volume, and variance of WOM, respectively. Previous research has verified the impact of WOM on sales (Chevalier & Mayzlin, 2006; Liu,

2006). *Price* indicates average price per person (Lu et al., 2013). To address concerns regarding the potential endogeneity of price, we constructed the instrumental variable introduced by Lu et al. (2013). In our model, price was calculated based on the self-reported price by consumers, which reflected their consumption level. Lu et al. (2013) argues that if consumers have a budget, their historical eat-out consumption level will impact how much they pay when eating out. However, a consumer's overall eat-out budget is not likely to directly impact any particular restaurant's sales because the budget will be spread among many different restaurants (Lu et al., 2013). Therefore, the average historical eat-out consumption of all reviewers of the focus restaurant before the period under study is an appropriate instrumental variable for price.

Shopnum denotes the number of branches. Owning a high number of branches means that a business has accumulated a certain reputation and is large. *Popularity* is the popularity score of the restaurant. *Tenure* denotes the number of months since the restaurant's establishment. *Openhour* denotes the operating hours of the restaurant. *Time dummy* represents a set of time-dummy variables at the daily level. In addition, $\mu_{0i} - \mu_{4i}$ captures the unobserved business district-specific effect. μ_{ij} captures the unobserved restaurant-specific effect.

5 Data Analysis and Results

5.1 Descriptive Statistics

Table 2 presents the descriptive statistics of the key variables. On average, MR-P outnumbered MR-N on ABC.com. In addition, the average degree of personalization of MR-P and MR-N was relatively low. *Cr4* and *Mr* had wide ranges, showing the varying competitive intensities of different business districts and distinct market positions of enterprises.

Table 2. Descriptive Statistics

Variable	Mean	St. dev.	Min	Max
<i>Sales (RMB)</i>	1783.56	3145.95	5	92879
<i>RepPVol</i>	16.175	80.338	0	2526
<i>RepNVol</i>	1.059	3.41	0	74
<i>RepPPer</i>	0.146	0.262	0	0.95
<i>RepNPer</i>	0.183	0.26	0	0.907
<i>Cr4</i>	0.22	0.124	0.06	1
<i>Mr</i>	0.01	0.028	1.066e-08	1

Table 3. Moderating Effects of Competitive Intensity and Market Position

Variable	Model 1	Model 2
<i>RepPVol</i>	0.055*** (0.012)	0.100*** (0.019)
<i>RepNVol</i>	0.056** (0.026)	0.069** (0.028)
<i>RepPPer</i>	-0.028 (0.021)	-0.013 (0.047)
<i>RepNPer</i>	0.058*** (0.018)	0.095*** (0.034)
<i>Cr4</i>	-0.460*** (0.147)	-0.448*** (0.069)
<i>Mr</i>	9.542** (4.122)	10.420** (4.180)
<i>Cr4 * RepPVol</i>		0.075** (0.030)
<i>Cr4 * RepNVol</i>		-0.001 (0.057)
<i>Cr4 * RepPPer</i>		-0.059 (0.090)
<i>Cr4 * RepNPer</i>		0.057 (0.135)
<i>Mr * RepPVol</i>		0.197* (0.106)
<i>Mr * RepNVol</i>		-0.755* (0.414)
<i>Mr * RepPPer</i>		0.326 (0.405)
<i>Mr * RepNPer</i>		-1.846** (0.869)

Note: Clustered robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Control variables are not shown in the table.

5.2 Results

The coefficients were estimated using the maximum likelihood (ML) method (de Leeuw et al., 2008; Luke, 2004). Table 3 presents the estimation results, which were run using Stata 14. Model 1 reports the direct effects of MR-P volume, MR-P degree of personalization, MR-N volume, and MR-N degree of personalization. Model 2 shows the moderating effects of competitive intensity and market position.

The results support H1 and H5. The influence of MR-P volume on sales declined with increasing competition

and decreasing market position ($\hat{\beta}_7 = 0.075$, $p < 0.05$; $\hat{\beta}_{11} = 0.197$, $p < 0.1$). Since intense competition and low market position cause consumers to suspect ulterior motives when they observe MR-P (Brown, 1990; Campbell & Kirmani, 2000; Vonk, 1998), consumers may interpret MR-P as promotional activities and ingratiation when competition is fierce and market position is low (Brown, 1990; Wang & Chaudhry, 2018). MR-P do not serve as the basis for consumer decisions if they are distrusted by consumers. Therefore, the positive effect of MR-P volume decreases in the presence of stronger competition and lower market position.

H2 and H6 are unsupported. MR-P degree of personalization showed no effect on sales ($\hat{\beta}_3 = -0.013$, $p > 0.1$; $\hat{\beta}_9 = -0.059$, $p > 0.1$; $\hat{\beta}_{13} = 0.326$, $p > 0.1$). The reason for this finding may be that personalized MR-P can activate consumer suspicion regardless of competitive intensity and market position. Thus, our findings indicate that improving the degree of personalization of MR-P is ineffective.

Regarding H3, although the difference between the coefficients for $Cr4 * RepPVol$ and $Cr4 * RepNVol$ was insignificant ($z = 0.96$, $p > 0.1$),² competitive intensity was observed to have a significant interaction effect with MR-P volume ($\hat{\beta}_7 = 0.075$, $p < 0.05$) and an insignificant interaction effect with MR-N volume ($\hat{\beta}_8 = -0.001$, $p > 0.1$). Increasing MR-N volume indicates firms' efforts to ensure that more consumers receive responses. Investing effort in MR-N is a reasonable behavior because consumers are generally seeking to elicit a response when they leave a complaint (Ma et al., 2015; Willemssen et al., 2013). Thus, consumers would be less likely to suspect ulterior motives when observing MR-N because MR-N can fulfill consumers' needs for responses and may provide meaningful information for consumers (Wang & Chaudhry, 2018). Therefore, as our findings indicate, the influence of competitive intensity on consumer trust in MR-N is weak, and MR-N volume maintains a relatively large impact on consumers' purchase decisions regardless of competitive intensity.

MR-P and MR-N degrees of personalization were found to have insignificant interaction effects with competitive intensity ($\hat{\beta}_9 = -0.059$, $p > 0.1$; $\hat{\beta}_{10} = 0.057$, $p > 0.1$). The difference between the coefficients for $Cr4 * RepPPer$ and $Cr4 * RepNPer$ was insignificant ($z = -0.52$, $p > 0.1$). Thus, H4 cannot be verified. The insignificant interaction effect between MR-P degree of personalization and competitive intensity can be explained by the lack of MR-P personalization's effect on sales. However, in contrast to MR-P personalization, MR-N personalization exerted a significant effect on sales and the insignificant interaction effect between MR-N personalization and competitive intensity implies that MR-N personalization remains effective regardless of competitive intensity. Since, as discussed above, consumers are less likely to suspect ulterior motives of firms writing MR-N, the effect of competitive intensity on consumer trust in personalized MR-N is minimal.

Our results also support H7 and H8 ($\hat{\beta}_{12} = -0.755$, $p < 0.1$; $\hat{\beta}_{14} = -1.846$, $p < 0.05$). A lower firm market position signified a stronger positive influence of MR-N volume and degree of personalization on sales. Market

position exerts a weak influence on consumer trust in MR-N because such responses meet consumers' response demands and are considered valuable by consumers (Crijns et al., 2017; Wang & Chaudhry, 2018). Moreover, increasing the volume and degree of personalization of MR-N can enable consumers to obtain more useful and relevant information and facilitate their decision-making. Given the non-diagnosticsity of low market positions, consumers demand more information to make purchase decisions regarding enterprises with low market positions. Hence, the effects of MR-N volume and degree of personalization on consumers' purchase decisions are more evident for enterprises with lower market position.

Figure 6 illustrates the impacts of MR-P volume, MR-N volume, and MR-N degree of personalization on sales at different levels of competitive intensity and market position (there are two standard deviations between high and low levels). When competition is weaker or market position is higher, an increase in MR-P volume is associated with a greater increase in sales. At lower levels of market position, the influences of MR-N volume and MR-N degree of personalization are more significant.

5.3 Robustness Checks

We performed a number of robustness checks. First, concerns may arise about the potential relation between competitive intensity and market position. When there is stronger competition, a firm is likely to have a lower market share and position. To address this issue, we examined the moderating effect of market position in weakly competitive environments (i.e., above the mean value of $Cr4$) in which firms have respectively high and low market positions, meaning that competitive intensity and market position have a weak relationship. Similarly, we examined the moderating role of competitive intensity for firms with a low market position (i.e., below the mean value of Mr) because they may face either strong or weak competition. As shown in Models 3 and 4 in Table 4, the moderating effects of market position and competitive intensity remained consistent.

Second, restaurants in the same business district but serving different cuisine types may not be close competitors. Thus, restaurants were identified as direct competitors when they were located in the same business district and served the same cuisine type. The results presented in Model 5 are qualitatively similar to those shown in Model 2.

the linear combination of coefficients was the coefficient for $Cr4 * RepPVol$ – the coefficient for $Cr4 * RepNVol$. If 0 does not fall in the 95% confidence interval, the difference between the coefficients is significant.

² We performed the statistical test of the difference between two coefficients by running the command `lincomest` in Stata, which calculates confidence intervals and p -values for linear combinations of coefficients (Newson, 2016). In this context,

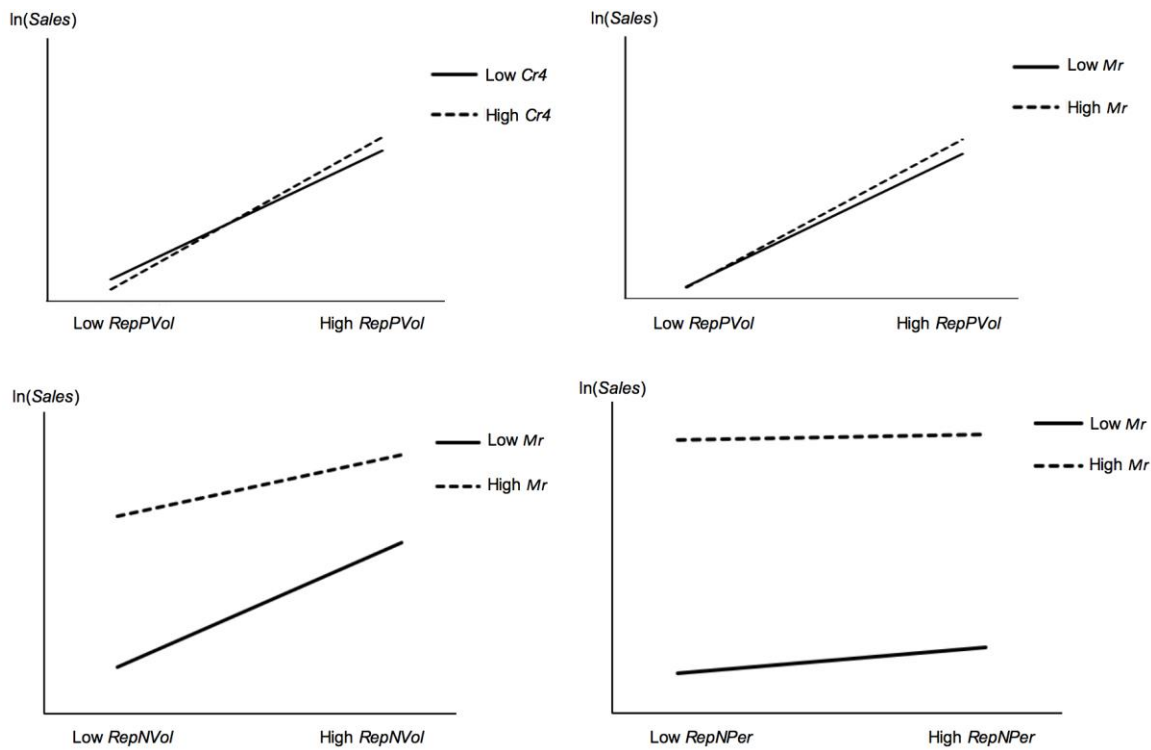


Figure 6. Interaction Effect Plot

Table 4: Robustness Checks

Variable	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
RepPVol	0.064*** (0.022)	0.129*** (0.038)	0.064 (0.056)	0.104* (0.055)	0.041 (0.040)	0.100*** (0.019)	-0.002 (0.024)	0.098*** (0.020)
RepNVol	0.016 (0.021)	0.048** (0.023)	0.069*** (0.018)	0.074*** (0.013)	0.056* (0.034)	0.067** (0.029)	-0.017 (0.036)	0.069** (0.028)
RepPPer	0.005 (0.005)	-0.009 (0.025)	-0.012 (0.035)	-0.012 (0.036)	-0.011 (0.052)	-0.013 (0.046)	-0.020 (0.013)	-0.012 (0.047)
RepNPer	0.048*** (0.005)	0.052*** (0.017)	0.101*** (0.032)	0.102*** (0.026)	0.093** (0.037)	0.089** (0.035)	0.062*** (0.018)	0.094*** (0.035)
Cr4	-0.470*** (0.059)	-0.392*** (0.138)	-1.129*** (0.076)	-0.453*** (0.156)	-0.443*** (0.068)	-0.465*** (0.070)	-0.405*** (0.059)	-0.448*** (0.069)
Mr (SalesRank in Model 6)	7.483*** (0.906)	11.162** (4.363)	10.446** (4.476)	0.026** (0.012)	10.415** (4.178)	10.332** (4.154)	10.427** (4.218)	10.420** (4.180)
Cr4 * RepPVol		0.093** (0.043)	0.154*** (0.054)	0.074* (0.043)	0.079*** (0.030)	0.076*** (0.029)	0.084*** (0.030)	0.076** (0.030)
Cr4 * RepNVol		-0.074 (0.084)	0.010 (0.116)	-0.003 (0.037)	-0.004 (0.058)	-0.001 (0.057)	0.026 (0.062)	-0.003 (0.055)
Cr4 * RepPPer		-0.037 (0.155)	-0.052 (0.061)	-0.057 (0.112)	-0.062 (0.095)	-0.055 (0.087)	-0.041 (0.050)	-0.059 (0.091)
Cr4 * RepNPer		-0.003 (0.157)	0.038 (0.066)	0.048 (0.148)	0.066 (0.139)	0.060 (0.138)	0.058 (0.074)	0.056 (0.135)
Mr * RepPVol (SalesRank in Model 6)	0.151*** (0.028)		0.219** (0.104)	0.0004** (0.0002)	0.199* (0.108)	0.204* (0.107)	0.293*** (0.076)	0.193* (0.105)
Mr * RepNVol (SalesRank in Model 6)	-0.571*** (0.110)		-0.756** (0.347)	-0.002** (0.001)	-0.772* (0.417)	-0.759* (0.418)	-0.755* (0.434)	-0.753* (0.412)
Mr * RepPPer (SalesRank in Model 6)	0.206 (0.193)		0.328 (0.327)	0.001 (0.001)	0.425 (0.431)	0.332 (0.404)	0.232 (0.158)	0.328 (0.404)
Mr * RepNPer (SalesRank in Model 6)	-1.035*** (0.183)		-1.912** (0.890)	-0.005** (0.002)	-1.907** (0.889)	-1.814** (0.856)	-1.293** (0.583)	-1.849** (0.868)

Note: Clustered robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Control variables are not shown in the table.

Third, although ABC.com provides much information about the market position of restaurants, such as sales statistics, as well as various restaurant ranking lists calculated based on sales, consumers may not be aware of the exact market share of each restaurant. To check the robustness of our results, we further measured market position using sales rank (*SalesRank* in Table 4). The results reported in Model 6 are consistent with those shown in Model 2.

Fourth, we assumed an independent covariance structure that allows for a distinct variance for each random effect within a random-effects equation with all covariances set to zero. However, this condition may be difficult to satisfy in practice. Hence, we relaxed this assumption and adopted an unstructured covariance structure (Luke, 2004). Model 3 presents the results. No significant difference was found between Models 2 and 7.

Fifth, certain enterprises exhibited no managerial responses during a certain period. In the observations without managerial responses, we set the average degree of personalization to zero, which may have caused biases. Thus, we reestimated the model after removing these data. Model 8 shows that the results are qualitatively similar to those reported in Model 2.

Sixth, another concern would be the potential endogeneity of the volume and the degree of personalization of MR-P and MR-N. First, we used instrumental variables (IV) to address this issue. For MR-P volume, we developed two IVs. One is the average rank of the reviewers who left positive reviews (i.e., satisfied reviewer group) about the focal restaurant. Previous studies suggest that firms are more likely to respond to consumers with greater influence (e.g., higher rank) (Gunaratne et al., 2018). Thus, a higher average rank results in more review responses. However, reviewer rank is unlikely to correlate with the restaurant-specific shock (e.g., promotions) captured by the error term of the focal restaurant. Taking these two conditions together, we used the average rank of satisfied reviewers as an IV for MR-P volume. The other IV is the mean level of MR-P volume of restaurants from the same business district and cuisine type. Such an IV type is commonly adopted in the literature (e.g., Berry et al., 1995; Ghose & Han, 2014; Kleis et al., 2012; Liu et al., 2015).

Although the response strategy of a restaurant may correlate with the strategies of other restaurants in the same business district and cuisine type because of common shocks, the average MR-P volume of other restaurants is unlikely to correlate with the restaurant-specific shock, which is captured by the error term of the focal restaurant. Based on the same rationale, we used the average rank of the dissatisfied reviewer group and the mean level of MR-N volume of

restaurants from the same business district and cuisine type as the IVs for MR-N volume.

For MR-P degree of personalization and MR-N degree of personalization, we constructed the same type of IVs as those for MR-P volume and MR-N volume. In particular, we used the average rank of the satisfied reviewer group as an IV for MR-P degree of personalization because managers are more likely to provide a specific response to consumers with higher levels of influence. The mean level of MR-P degree of personalization of restaurants from the same business district and cuisine type is another IV for MR-P degree of personalization. Similarly, we used the average rank of the dissatisfied reviewer group and the mean level of MR-N degree of personalization of restaurants from the same business district and cuisine type as IVs for MR-N degree of personalization. We further used a variation of the Chamberlain device to explicitly account for the potential correlation between the random effects and the covariates (Chamberlain, 1980; Yan & Tan, 2014). Specifically, we rewrote the restaurant-specific unobserved heterogeneity as $\mu_i = \mu_i^0 + \mu^1 \bar{X}_i$, where \bar{X}_i is the vector of the means of covariates that influence sales, and μ^1 denotes the vector of coefficients to be estimated. The results using IV and Chamberlain device approach, as shown in Model 9, are qualitatively similar to those shown in Model 2, indicating that the potential endogeneity issue did not result in significant differences in findings.

Finally, responses that only thank the reviewer without any further statements, such as “Thank you for your review,” may be meaningless and have little effect on sales. Thus, we reestimated the model after deleting such responses. The results shown in Model 10 remain consistent. The proportion of such responses (only approximately 0.19%) was rather low in our data.

6 Additional Analysis

6.1 Experiment

We conducted an experiment to verify the impacts of competitive intensity and market position on consumer trust in managerial responses, which we address in our hypotheses, recruiting a total of 659 undergraduate students. Participants were initially randomly assigned to one of the four contexts: weak competition, strong competition, low market position, and high market position. They were instructed to carefully read a scenario. To avoid potential biases associated with brands, the restaurant name was not revealed. Instead, participants were told that the reviews were posted for Restaurant A (Wei et al., 2013). Participants in the weak competition condition read: “Imagine that you are going to choose a restaurant for dinner and are browsing the reviews and responses of Restaurant A.

Restaurant A faces weak competition.” In the conditions of strong competition, low market position, and high market position, the last sentence was replaced by “Restaurant A faces strong competition,” “Restaurant A is in an inferior position in the market, occupying only a small market share,” and “Restaurant A is in a leading position in the market, occupying a large market share,” respectively.

After reading the scenario, participants were exposed to a set of positive or negative reviews and corresponding responses for Restaurant A. The reviews and responses were adapted from real reviews and responses posted on ABC.com to provide a natural setting for the experiment. The degree of personalization of responses (high vs. low) and the volume of responses (large vs. small) were manipulated experimentally to make causal inferences.³ After exposure to the stimuli, participants were asked to answer three groups of questions. The first group included several questions about manipulation checks. The second group consisted of a series of questions measuring their perceptions of ulterior motives (Campbell & Kirmani, 2000; DeCarlo, 2005; Kirmani & Zhu, 2007; Vonk, 1998), trust toward the responses (Crijns et al., 2017; Soh et al., 2009) and purchase intentions (Paharia et al., 2011). The third group of questions collected demographic information. The details of the experiment are provided in Appendix A. We ran ANOVA analyses, and provide the results in Appendix B. The manipulations of participants’ perceived valence of reviews, competitive intensity, market position, degree of personalization and volume of responses were proven effective (See Table B1).

Under conditions of small and large MR-P volume, significantly greater suspicion of ulterior motives and lower trust in MR-P correlate with stronger competition and a lower market position (See Row 2 and 3 of Table B2). As a result, large MR-P volume exhibited a significant positive impact on purchase intentions in the presence of weak competition and high market position, exerting no effect on purchase intentions in the presence of strong competition and low market position (See Column 2 of Table B3). These results indicate that competition and market position moderate the impact of MR-P volume by influencing suspicion of ulterior motives and consumer trust. In addition, the results show that enhancing the personalization of MR-P had an insignificant influence on purchase intentions regardless of competition level and market position (See Column 3 of Table B3), which is consistent with the main results in Model 2.

³ The volume of responses (large vs. small) was determined based on the summary statistics of our data. The degree of personalization of responses (high vs. low) was based on the similarity score obtained from the text analysis.

As expected, competition showed a weak influence on the suspicion of ulterior motives and consumer trust in all the four settings of MR-N (see the last four rows of Column 2 in Table B2). MR-N volume and degree of personalization had significant positive effects on purchase intentions in both strong and weak competition conditions (see Row 2 and 3 in the last two columns of Table B3). These results suggest that improving the volume and degree of personalization of MR-N is effective regardless of the level of competition because of the minimal influence of competition on consumer trust and suspicion of ulterior motives. Market position, likewise, had a weak effect on suspicion of ulterior motives and trust in MR-N regardless of volume and degree of personalization (See the last four rows of Column 3 of Table B2). Consistent with H7 and H8, the influences of MR-N volume and degree of personalization on purchase intentions declined with increasing market position ($\chi^2(1)_{\text{volume}} = 3.00, p < 0.1$; $\chi^2(1)_{\text{degree of personalization}} = 3.02, p < 0.1$).

6.2 Further Exploration of Response Quality

We examined the volume and the degree of personalization of MR-P and MR-N. Volume can be regarded as firms’ effort in terms of quantity, whereas degree of personalization can be regarded as firms’ effort in terms of quality. Response quality involves various aspects. In addition to the degree of personalization, we also considered another factor that may affect response quality. The factor is whether the response contains identity information, such as name and job title of the person who responded to the review.⁴ Responses with identity information can make consumers aware of who they are communicating with and who is responsible for the response, which can be perceived as a conversational human voice (Crijns et al., 2017; Kwon & Sung, 2011). A conversational human voice is important for effective online communication and may influence response quality (van Noort & Willemsen, 2012). Thus, we added two variables, *RepPIden* and *RepNIden*, to our model. *RepPIden* denotes the ratio of the volume of MR-P with identity information to the total volume of MR-P. *RepNIden* indicates the ratio of the volume of MR-N with identity information to the total volume of MR-N.

The results are provided in Appendix C. The effect of MR-N with identity information was not moderated by competitive intensity. As discussed above, investing

⁴ This factor was determined after we communicated with the managers of ABC.com. Responses with identity information were identified based on a keyword list of job title and contact information. A name usually appears with a job title or contact information.

effort in MR-N is likely to be considered reasonable and useful by consumers. Increasing the proportion of MR-N that include identity information indicates firms' efforts in communicating with consumers and addressing their complaints because the person leaving the response can be contacted. Thus, consumers will be less likely to suspect ulterior motives when observing MR-N with identity information, and MR-N with identity information would be expected to weaken the influence of competitive intensity on consumer trust. Increasing the proportion of MR-N with identity information should also remain effective when competition is intense, thus rendering the moderating effect of competitive intensity insignificant.

Similarly, the impact of market position on consumer trust in MR-N with identity information should be small as well. Given the non-diagnostics of the low market position, consumers require more information to make purchase decisions for firms with low market positions (Chen et al., 2011; Feldman & Lynch, 1988; Lee et al., 2017). MR-N with identity information should be useful when making decisions for such firms. Thus, increasing the proportion of MR-N with identity information exerts a larger influence on firms with lower market position. Increasing the proportion of MR-P with identity information showed no effect on sales because identity information is of little consequence when communicating with consumers who are already satisfied and not seeking a response.

7 Conclusion

7.1 Discussion of Findings

In this study, we examined how competitive intensity and market position moderate the impact of managerial responses on sales. We considered various aspects of managerial responses: MR-P volume, MR-P degree of personalization, MR-N volume, and MR-N degree of personalization. We found that the moderating effects of competitive intensity and market position vary for different aspects of managerial responses. MR-P volume exerted a more evident impact on sales when competition was weaker and market position was higher. Furthermore, increasing the MR-N volume and degree of personalization remained effective regardless of competitive intensity. Finally, we found that the influences of MR-N volume and degree of personalization on sales decline with increasing market position.

7.2 Theoretical Contributions

This study contributes to extant research on the impacts of managerial responses. Prior literature documenting the impacts of managerial responses devotes more attention to characteristics of managerial responses, such as volume (Lee et al., 2017; Xie et al.,

2014; Xie et al., 2017), response speed (Xie et al., 2017), and response strategy (Dens et al., 2015; Lee & Song, 2010; van Noort & Willemsen, 2012). However, managerial responses not only involve these characteristics but also the competitiveness of the environment and the market position of enterprises that provide such responses, and the impact of managerial responses may change according to competitive intensity and market position. Our findings demonstrate that competitive intensity and market position moderate the effects of managerial responses on sales, and thus deepen the understanding of the impact of managerial responses.

Our study also contributes to current research on the moderating effects of competitive environment and market position. Previous studies have revealed that both factors play a moderating role in relationships between firm behaviors and performance (Chauvin & Hirschey, 1993; Kim & Joo, 2013; Liu & Yang, 2009; Melville et al., 2007; Xue et al., 2012). We further demonstrated that competitive intensity and market position influence the effectiveness of managerial responses, extending the literature on the moderating effects of competitive environment and market position into the field of managerial responses.

From the perspective of consumer trust, we applied the insights of the PKM that are widely used in traditional marketing literature (e.g., advertising) to the context of managerial responses. The PKM and its related research show that persuasion attempts can induce consumer suspicion (Campbell & Kirmani, 2000; Crijns et al., 2017; Friestad & Wright, 1994). In terms of the PKM, Crijns et al. (2017) demonstrate that managerial responses can activate consumer skepticism; however, they did not explore consumer trust in terms of managerial responses of businesses with different market positions and face different competitive environments. Based on the PKM and its related research, this study explains how competitive intensity and market position affect consumer trust in managerial responses. We also conducted an experiment to verify our theoretical explanations.

Finally, we combine two theoretical perspectives to explain the moderating effects of market position. Based on the accessibility-diagnostics model, Chen et al. (2011) revealed the effects of two pieces of information—high market position and low market position—on consumers' purchase decisions. The diagnostics of these two pieces of information can influence whether consumers demand other information, such as managerial responses, to make decisions. On the basis of the conclusions of Chen et al. (2011), our research explains the moderating role of market position from the perspectives of information diagnostics and consumer trust. Our findings suggest that the moderating effects of market position in the relationships between different types of managerial

responses and sales can be explained from different perspectives. Market position affects the impact of MR-P volume by influencing consumer trust. The effectiveness of MR-N volume and degree of personalization change with market position because high and low market positions feature different degrees of diagnosticity.

7.3 Practical Implications

Certain industries present clear regional differences (Drucker, 2011). In our research data, major differences were found in the industry concentration among business districts, thus also reflecting regional differences in terms of competition. Enterprises in different regions face different competitive environments and occupy different market positions. Our study highlights that the effectiveness of managerial responses is affected by competitive intensity and market position. Therefore, enterprises should adjust their response strategies on the basis of data on competition and market position to maximize profit. When competition is intense, firms should mainly monitor negative WOM and respond to comments in a personalized manner, given the negligible impact of MR-P volume. When competition is weak, firms could appropriately increase the volume of MR-P. Simultaneously, increasing MR-N should also be considered, given their significant influence on sales in an environment of any level of competitiveness.

For enterprises with high market positions, MR-N volume and degree of personalization exhibit minimal effects on sales. Thus, such enterprises can reduce investments in these types of responses and transfer resources to other marketing tools, such as promotional activities. Enterprises with a low market position should focus on responding to negative WOM rather than positive WOM and enhance the personalization of MR-N to increase the positive impact of managerial responses. These enterprises must see through the “lens” of consumers to perfect the responding approaches that make responses acceptable to

consumers. Finally, our findings indicate that it is not worthwhile for firms to compose personalized responses to positive WOM because MR-P personalization shows no effect on sales.

7.4 Limitations and Research Directions

This study offers valuable insights into managerial responses but our results could be extended in various ways. First, our data only covered two administrative districts in Beijing. Data from other administrative districts could be incorporated in the future to verify the conclusions of this research. Second, the sales data used in this study did not include offline sales, which should be obtained in future research to test the robustness of our results. Third, we considered public managerial responses but enterprises may privately send messages to consumers to solve problems. Private communications between enterprises and consumers are similar to traditional service recovery, which is also one-to-one and nonpublic. Previous service recovery literature has manifested the effectiveness of service recovery efforts (McCullough, 2000; Swanson & Hsu, 2011), suggesting that private communications may play a similar role. Further comparison between public managerial responses and private communications is also worthy of an investigation. Fourth, this research only studied responses from firms but consumers may also publicly react to these responses. All public interactions between consumers and companies are capable of conveying further information. Hence, future research could collect this information to identify consumers’ perceptions and attitudes in greater detail.

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Appendix A: Experiment Design (Example of the Weak Competition and Highly Personalized MR-P Condition)

Imagine that you are going to choose a restaurant for dinner and are browsing the reviews and responses of restaurant A. **Restaurant A faces weak competition.**

You observe the following responses to positive reviews by restaurant A.

Positive review 1: Suitable for children. The food tasted good.

Response 1: I'm really happy that your child can have a good dining experience! Welcome to our restaurant. We hope your child likes the dishes.⁵

Positive review 2: The lamb chops and beef kebabs were delicious.

Response 2: Thanks for coming to our restaurant and thank you for your comments. Our mutton and beef are from the best cuts. Thank you for your recognition and support. Looking forward to your next visit!

Please rate how you felt while reading the scenario. 1 = completely disagree and 7 = completely agree.

1. Restaurant A responds to positive reviews because restaurant A thinks responses result in increased sales.
2. Restaurant A has an ulterior motive for responding to positive reviews.
3. Restaurant A is slimy when responding to positive reviews.
4. I don't believe what restaurant A says in its responses.
5. Information conveyed in the responses is truthful.
6. Information conveyed in the responses is credible.
7. Information conveyed in the responses is honest.
8. I believe what restaurant A says in its responses.
9. The responses are reliable source of information when making purchase decisions.
10. I am skeptical about the truthfulness of the responses.
11. How likely would you choose restaurant A for dinner? (1 = unlikely and 7 = very likely)
12. You think the competition encountered by restaurant A is strong. (1 = completely disagree and 7 = completely agree)
13. You find the reviews negative. (1 = completely disagree and 7 = completely agree)
14. You think the responses are personalized. (1 = completely disagree and 7 = completely agree)

⁵ The degree of personalization for Response 1 and Response 2 are 0.922 and 0.944, respectively.

Appendix B: Results of the Experiment

Table B1. Manipulation Checks

	Valence (positive vs. negative)	Competitive intensity (strong vs. weak)	Market position (high vs. low)	Volume (large vs. small)	Degree of personalization (high vs. low)
Statistical test	$F(1, 657) = 582.85,$ $p < 0.01$	$F(1, 325) = 22.16,$ $p < 0.01$	$F(1, 330) = 90.61,$ $p < 0.01$	$F(1, 325) =$ $166.50, p < 0.01$	$F(1, 330) = 106.59,$ $p < 0.01$

**Table B2. The Effects of Competitive Intensity and Market Position
on Perceived Ulterior Motives and Trust**

Conditions	Competitive intensity (strong vs. weak)	Market position (high vs. low)
Small MR-P volume	$F(1, 38)$ Motive = 3.18, $p < 0.1$; $F(1, 38)$ Trust = 3.59, $p < 0.1$	$F(1, 36)$ Motive = 3.16, $p < 0.1$; $F(1, 36)$ Trust = 3.16, $p < 0.1$
Large MR-P volume	$F(1, 37)$ Motive = 3.31, $p < 0.1$; $F(1, 37)$ Trust = 4.57, $p < 0.05$	$F(1, 39)$ Motive = 3.85, $p < 0.1$; $F(1, 39)$ Trust = 4.06, $p < 0.1$
Low MR-P degree of personalization	$F(1, 36)$ Motive = 4.09, $p < 0.1$; $F(1, 36)$ Trust = 3.03, $p < 0.1$	$F(1, 41)$ Motive = 2.91, $p < 0.1$; $F(1, 41)$ Trust = 3.55, $p < 0.1$
High MR-P degree of personalization	$F(1, 41)$ Motive = 0.39, $p > 0.1$; $F(1, 41)$ Trust = 0.10, $p > 0.1$	$F(1, 39)$ Motive = 0.14, $p > 0.1$; $F(1, 39)$ Trust = 0.03, $p > 0.1$
Small MR-N volume	$F(1, 44)$ Motive = 0.10, $p > 0.1$; $F(1, 44)$ Trust = 0.07, $p > 0.1$	$F(1, 39)$ Motive = 0.04, $p > 0.1$; $F(1, 39)$ Trust = 0.34, $p > 0.1$
Large MR-N volume	$F(1, 39)$ Motive = 0.09, $p > 0.1$; $F(1, 39)$ Trust = 0.10, $p > 0.1$	$F(1, 39)$ Motive = 2.02, $p > 0.1$; $F(1, 39)$ Trust = 0.46, $p > 0.1$
Low MR-N degree of personalization	$F(1, 38)$ Motive = 0.02, $p > 0.1$; $F(1, 38)$ Trust = 0.11, $p > 0.1$	$F(1, 44)$ Motive = 0.68, $p > 0.1$; $F(1, 44)$ Trust = 0.02, $p > 0.1$
High MR-N degree of personalization	$F(1, 38)$ Motive = 0.74, $p > 0.1$; $F(1, 38)$ Trust = 0.01, $p > 0.1$	$F(1, 39)$ Motive = 0.12, $p > 0.1$; $F(1, 39)$ Trust = 0.35, $p > 0.1$

Table B3. The Effects of Volume and Degree of Personalization on Purchase Intention

Conditions	MR-P volume (large vs. small)	MR-P degree of personalization (high vs. low)	MR-N volume (large vs. small)	MR-N degree of personalization (high vs. low)
Strong competition	$F(1, 35) = 0.04,$ $p > 0.1$	$F(1, 35) = 0.21,$ $p > 0.1$	$F(1, 41) = 3.44,$ $p < 0.1$	$F(1, 40) = 4.21,$ $p < 0.05$
Weak competition	$F(1, 38) = 2.98,$ $p < 0.1$	$F(1, 40) = 0.02,$ $p > 0.1$	$F(1, 40) = 3.82,$ $p < 0.1$	$F(1, 33) = 3.73,$ $p < 0.1$
High market position	$F(1, 38) = 3.21,$ $p < 0.1$	$F(1, 40) = 0.28,$ $p > 0.1$	$F(1, 42) = 2.89,$ $p < 0.1$	$F(1, 40) = 3.16,$ $p < 0.1$
Low market position	$F(1, 36) = 0.40,$ $p > 0.1$	$F(1, 38) = 0.41,$ $p > 0.1$	$F(1, 34) = 13.13,$ $p < 0.01$	$F(1, 41) = 11.52,$ $p < 0.01$

Appendix C: Results of Response Quality

Table C1. Response Quality

Variable	Model 11
<i>RepPVol</i>	0.087 (0.056)
<i>RepNVol</i>	0.059*** (0.017)
<i>RepPPer</i>	-0.006 (0.037)
<i>RepNPer</i>	0.092** (0.036)
<i>RepPIden</i>	-0.013 (0.010)
<i>RepNIden</i>	0.032 (0.026)
<i>Cr4</i>	-0.443*** (0.151)
<i>Mr</i>	10.595** (4.420)
<i>Cr4 * RepPVol</i>	0.074* (0.043)
<i>Cr4 * RepNVol</i>	0.003 (0.029)
<i>Cr4 * RepPPer</i>	-0.055 (0.112)
<i>Cr4 * RepNPer</i>	0.075 (0.137)
<i>Cr4 * RepPIden</i>	-0.034 (0.041)
<i>Cr4 * RepNIden</i>	-0.018 (0.026)
<i>Mr * RepPVol</i>	0.362*** (0.096)
<i>Mr * RepNVol</i>	-0.601* (0.318)
<i>Mr * RepPPer</i>	-0.040 (0.272)
<i>Mr * RepNPer</i>	-1.468* (0.884)
<i>Mr * RepPIden</i>	0.127 (0.225)
<i>Mr * RepNIden</i>	-0.822*** (0.182)

Note: Clustered robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Control variables are not shown in the table.

Appendix D: Correlations

Table D1. Correlations

Variable	<i>ln(Sales)</i>	<i>RepPVol</i>	<i>RepNVol</i>	<i>RepPPer</i>	<i>RepNPer</i>	<i>Cr4</i>	<i>Mr</i>	<i>Val</i>	<i>Vol</i>	<i>Var</i>	<i>Shopnum</i>	<i>Price</i>	<i>Popularity</i>	<i>Tenure</i>	<i>Openhour</i>
<i>ln(Sales)</i>	-														
<i>RepPVol</i>	0.162	-													
<i>RepNVol</i>	0.198	0.632	-												
<i>RepPPer</i>	0.154	0.260	0.475	-											
<i>RepNPer</i>	0.164	0.267	0.456	0.866	-										
<i>Cr4</i>	-0.014	0.004	0.029	0.015	0.016	-									
<i>Mr</i>	0.309	0.071	0.121	0.077	0.087	0.426	-								
<i>Val</i>	0.099	0.086	0.102	0.144	0.189	0.023	0.063	-							
<i>Vol</i>	0.339	0.197	0.194	0.121	0.140	-0.017	0.157	0.154	-						
<i>Var</i>	0.179	0.044	0.118	0.155	0.166	-0.034	0.040	-0.059	0.155	-					
<i>Shopnum</i>	0.098	0.051	0.090	0.152	0.171	-0.020	0.033	0.099	0.095	0.116	-				
<i>Price</i>	0.299	0.131	0.188	0.231	0.259	-0.014	0.133	0.183	0.320	0.251	0.220	-			
<i>Popularity</i>	0.338	0.193	0.264	0.264	0.294	-0.028	0.146	0.197	0.318	0.187	0.236	0.444	-		
<i>Tenure</i>	0.050	0.008	-0.002	-0.040	-0.053	-0.061	-0.016	-0.131	0.251	0.097	0.001	0.095	-0.058	-	
<i>Openhour</i>	0.102	0.007	-0.019	-0.107	-0.134	-0.036	0.022	-0.163	0.138	0.085	-0.107	-0.068	-0.063	0.253	-

About the Authors

Yinli Huang is a PhD student in the Department of Management Science and Engineering in the School of Economics and Management, Tsinghua University. Her research interests focus on the business value of information systems, online managerial response, online consumer behavior, and electronic commerce.

Yue Jin is an assistant professor in the E-Business Department in the School of Information Technology and Management at the University of International Business and Economics, Beijing, China. She received her PhD in management science and engineering from the School of Economics and Management at Tsinghua University. Her research interests include economics, social media and networks, mobile and electronic commerce, and online education. Her research has appeared in *Electronic Commerce Research and Applications* and *Information Systems and e-Business Management*. Yue Jin is the co-corresponding author of this research.

Jinghua Huang is a full professor in the Research Center for Contemporary Management, Department of Management Science and Engineering, School of Economics and Management, Tsinghua University. She received her PhD from Tsinghua University in 2004. Her research interests include business value of IS/IT, social networking and electronic business. Professor Huang has published or will publish papers in the following journals: *Information Systems Research*, *Information & Management*, *Communications of Association for Information Systems*, *Electronic Commerce Research and Applications*, among others. Jinghua Huang is the co-corresponding author of this research.

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