



Beyond the review information: an investigation of individual- and group-based presentation forms of review information

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Abstract

Since most of today's consumers make purchase decisions based on online reviews, managers and researchers have been keen to determine how best to present review information in an online shopping context to maximize their persuasive power. Most online reviews are presented post-by-post, whereby individual reviewers express their respective opinions but lack group dynamism. As a result, it is worth asking what would happen if individual reviews are presented as a group? Drawing on social presence theory and information adoption literature, we propose a research framework to investigate the influences of two alternative presentation forms of review information (i.e., individual-based vs. group-based) on multiple-facet consumer evaluation of reviews, as well as their adoption of review information. By conducting two experiments (Study 1: N = 319; Study 2: N = 101), we find that, when given the same review information, consumers presented with the grouped review information rated higher review quality and credibility, but lower understandability, than consumers who were presented with individual review information. In addition, review quality, credibility, and understandability mediated the influence of review presentation forms on the consumer adoption of review information. Both theoretical and practical implications are discussed.

Keywords Online review · Social presence · Review quality · Review credibility · Review understandability

1 Introduction

Online reviews are considered as one of the most powerful information sources in the online shopping context when consumers make purchase decisions [2, 6, 47, 75, 80]. An online review usually refers to a post-consumption

evaluation and experience shared by consumers [7]. Industry reports such as ChannelAdvisor,¹ which are based on large-scale surveys, have revealed that more than 90% of consumers read online reviews before they make purchase decisions. Accordingly, managers have long recognized that online reviews serve as a valuable marketing tool for their e-commerce businesses [20, 21]. While traditional online reviews are presented as individual options that lack social interactions, managers have recently incorporated social elements in their online reviews, such as brand-centered online communities among consumers. Industry reports² have also suggested that the user experience shared by peer consumers usually enriches review information with the sense of social interaction. As a result, such reviews are more persuasive than the standard information offered by e-tailers. Nevertheless, small- to

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¹ ChannelAdvisor. 2010. "Through the Eyes of the Consumer: Consumer Shopping Habits Survey." Retrieved 08 Dec 2019, from <http://go.channeladvisor.com/rs/channeladvisor/images/us-wp-consumer-survey-2010.pdf>

² Blasingame, J. 2014. "In the Age of the Customer, Customers Co-Own Your Brand Message." Retrieved 17 Mar 2020, from <https://www.ageofthecustomer.com/index.php/in-the-age-of-the-customer-customers-co-own-your-brand-message/>

medium- sized e-tailers still suffer from a low volume of online reviews and lean review content. Many are left wondering about how to maximize the persuasive power of limited review information to boost their online sales [18, 76].

Meanwhile, researchers are also allocating increased attention to the significance of online reviews in the context of consumer behavior, in general [8, 10, 44], as well as in the context of social commerce, in particular [8, 47]. We reviewed the prior literature on online reviews and identified three main knowledge gaps. First, most previous studies examine the impacts of review information archives on consumer judgment and decision-making [67], perception and evaluation [68], and sales volume [65]. The literature on the influences of review information archives further diverges into two streams, with one focusing on review content information [31, 47] and the other on review contextual information [25, 27]. There is a very limited understanding of the influence of online review information presentation through technology design on consumer perception and behavior.

Second, while quite a few studies have demonstrated the power of technology design in manipulating information presentation across the contexts of human–computer interactions [61], e-commerce websites [30], and public image management for organizations [4], there is little evidence available for the online review setting. More importantly, even fewer studies have drawn on theories that enable a nuanced understanding of how technology design induces group dynamism among individually created information and messages online; the majority of the literature is anchored in theoretical perspectives with an individual-based focus, such as cognitive-fit perspective [34], construal level theory [43], and regulatory focus theory [54].

Third, we consider social presence theory as one of the few theoretical perspectives available that informs our individual- and group-based presentation forms. Social presence stands for a sense of “being with another” [3, pp. 456]. Social presence theory has been widely used to examine the driving factors of technology use in various contexts, such as social commerce platforms [52], online social networks [39], and virtual worlds communication [70]. There is limited research on how to leverage social presence theory to advance technology design. Moreover, although a small number of studies have focused on technology design, most of them have emphasized the integration of anthropomorphism elements in technology design to elicit consumer perceptions of social presence [e.g., 30, 33, 63]. The extant literature on social presence theory ignores the potential power of the collective presentation of massive isolated users online, which coincides with the original definition of social presence—that is, “being with another” through the virtual channel.

Toward this end, our study draws on social presence theory to explore the collective presentation effects in online review systems and designs two alternative forms of review presentations—namely, individual- and group-based presentation forms. Specifically, *individual-based presentation form* presents online reviews in the traditional format where individual opinions are separate and independent, and there is a lack of ideas and information exchanged. In contrast, a *group-based presentation form* presents reviews as clusters, where a first piece of review information appears as a leading message and is then followed and “discussed” by a few other pieces of review information. Following the rationale underlying social presence theory, we expect that the group-based presentation form more effectively enables a sense of group discussion and social connection among reviewers, as compared with the individual-based presentation form.

In the following, we review the literature on online reviews and explain individual- and group-based presentation forms that are anchored in social presence theory. We then propose an integrated framework to elaborate on how the sense of social presence elicited through different forms of review presentation influences the consumer’s evaluation of review information in terms of quality, understandability, and credibility, and consequently, affects the consumer’s adoption intention of the review information. We then conduct two experiments to test six research hypotheses in the integrated framework. Study 1 investigates the differential impacts of group- and individual-based presentation forms of review information on consumer evaluation in terms of review quality, understandability, and credibility, as well as review adoption intentions; Study 2 extends the generalizability of the findings in Study 1 by adopting an alternative product and incorporating review content with both positive and negative valences. Finally, the implications of our findings for researchers and practitioners are discussed.

2 Theoretical background

2.1 Prior literature on online review

We analyze previous studies on online reviews and find that most examine the influences of review information archives rather than how review information is presented through technology design. Specifically, we distinguish two aspects of information conveyed in online reviews, that is, review content information and review contextual information. Review content information refers to the concrete descriptions that reviewers posted online based on their consumption experience, such as review valence. The literature suggests that, while positive reviews usually lead to consumer evaluation of review helpfulness [58], product sales [38], and willingness to endorse a product via social

media [47], negative reviews yield mixed consequences. Some scholars argue that negative reviews exhibit a greater influence on sales [10] and perceived helpfulness [44] than positive reviews; others contended that no significant relationship exists between review valence and sales [21, 49]; still others suggest that whether positive or negative reviews boosted product or service sales depended on consumers' characteristics [80]. In addition, other review content information, such as review dispersion and review emotional expression, have also been explored in relation to consumer evaluations and product or service sales [31, 78].

Review contextual information signifies the information that is present beyond the review content. Review contextual information provides readers with background information about reviews or other review-related information, which helps readers better understand and make judgments about the review information. For example, the disclosure of reviewer identity, that is self-defined information about reviewers, such as historical review experience and self-reported expertise, results in perceived review helpfulness and increased sales [25, 27]. Other review contextual information about reviewers, such as average usefulness of historical reviews [27] or self-evaluated expertise [13], have also been extensively investigated in the prior literature.

As mentioned, most studies on online reviews focus on either review content information or contextual information, and seldom examine the potential influence of how review information is presented to consumers through technology design. A series of seminal works have consistently demonstrated the significance of information presentation through different technology designs in the consumer evaluation and decision-making processes [50]. For instance, Hong et al. [34] find that when product information is presented in either a mixture or list format, consumers with either searching or browsing intentions evaluated the same product information differently. Köhler et al. [43] discover that interactive decision aids in either abstract or concrete forms of communication induced different consumer responses. Cable et al. [4] also suggest that different media designs entailed different levels of media richness and information credibility, which in turn affected subjective perceptions of job seekers as media content consumers on target firms' public images.

While the seminal works on technology design inform our tentative examination of review information presentation, we notice that the studies on technology design usually draw on theories with an individual-based focus, ranging from cognitive-fit perspective [34] and regulatory focus theory [54], to cognitive absorption lens [45] and information processing theory [46]. Next, we draw on social presence theory and develop an integrative theoretical framework of review information presentation, as social presence theory is one of the few theories available to address how isolated review

information presented online can stimulate group-based dynamism and social connections among consumers.

2.2 Social presence theory and review information presentation design

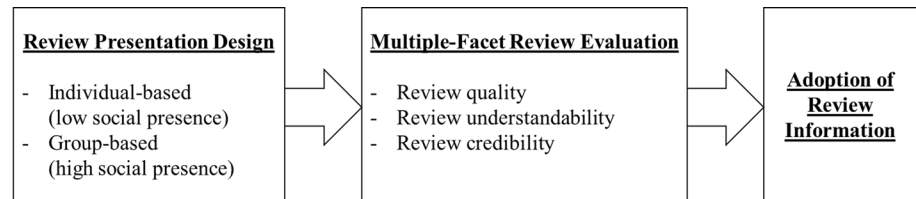
Social presence denotes a sense of “being with another” during communication through media [3, pp. 456]. For example, face-to-face communication involves the highest level of social presence, whereas text messages induce a limited social presence due to information loss on facial expressions and body language [64]. The concept of social presence later evolves and stands for the media affordances of human warmth and sociability [30]. For example, aspects of someone's personal life disclosed as social cues on Facebook or Twitter enhance social presence and account for the tendency of user addiction to social networking sites [9]. Social presence also enhances trust in the online business relationships, thereby informing the prosperity of social commerce [52].

Given the salience of social presence in communication through virtual channels, scholars continue to explore how the use of different technologies induces different levels of social presence [22, 39, 59, 70]. Empirical evidence has extensively shown that individuals perceive a sense of interactions with others in the virtual context despite the lack of physical interactions. For example, Kahlow et al. [39] suggest that online communication technologies (e.g., Snapchat) that arouse a high level of perceived social presence are capable of retaining more users than the ones that do not. The sense of social presence also effectively reduces uncertainty perceptions among collaborators and effectively promotes communication in virtual workplaces [70]. Consumers' social presence perceptions are also strongly associated with their trust development and virtual shopping experiences in social commerce [52, 79].

Although many studies have explained the effect of social presence on technology use, little attention and effort have been devoted to exploring the potential of social presence theory to advance technology design. A handful of relevant studies have focused on incorporating anthropomorphism elements in the virtual or artificial contexts but have overlooked the potential power of the collective presentation of isolated physical users online. For instance, researchers show that pictorial, in addition to text information [59, 77], humanoid embodiment and human voice [61], and computer vividness [32], can effectively stimulate consumer perceptions of social presence, increased trust perceptions, and technology use intentions.

Integrating both the insights and the limitations of the extant literature on social presence theory, we devise two presentation forms of review information, that is individual-based and group-based presentation forms. Individual-based

Fig. 1 Research framework



presentation form entails the traditional review information presentation format, where reviews are presented independently and separately online (i.e., low social presence). Group-based presentation form presents reviews on a group basis, where consumers who read the review information tend to experience an atmosphere of group discussion and dynamism (i.e., high social presence). Next, we develop an integrated framework of review presentation design, elaborating on the consequences of the two review presentation forms based on social presence theory.

2.3 An integrated framework of review presentation design

Before discussing the integrated framework of review presentation design in detail, we identify three facets of the consumer's evaluation of review information, that is review quality, understandability, and credibility. While some scholars investigate information adoption through the taxonomy of information content characteristics and source credibility [66, 71], others further classify information content characteristics into two categories: information usefulness and ease of use [36, 51]. The underlying rationale of usefulness or performance expectancies and ease of understanding or effort expectancies has been widely validated across different technology-related contexts, including technology use [19], e-commerce [29], and system implementation [1]. Yet, some studies suggest that information quality is closely related to understandability [55] and that information quality leads to information credibility [23]. Nevertheless, our study considers the three facets of review information evaluation as mutually exclusive and exhaustively covering the key characteristics of review information, and their relationships are beyond our research focus.

Particularly, in our context of review information adoption, review quality captures the usefulness of review information [51] and stands for the degree to which consumers perceive reviews as instrumental and plausible in helping them make judgements and decisions [71, 81]. Review understandability captures the ease of use dimension [51] that includes the ease of understanding of review information [36] and refers to the degree of perceived complexity or the amount of cognitive effort needed to understand review information. Review credibility is similar to source credibility [81] but symbolizes the trustworthiness of review

information content rather than the review information source.

Since the social cues embedded in technology design enhance social presence and contribute to favorable technology beliefs [77, 79], we propose the integrative framework of review presentation design in Fig. 1. This framework aims to highlight the influence of social presence realized through review presentation design on consumer evaluation as well as adoption behavior. Specifically, consumers who perceive a high level of social presence through the group-based presentation form (vs. a low level of social presence through the individual-based presentation form) tend to evaluate the review information favorably in terms of quality, understandability, and credibility, and are ultimately willing to adopt the review information. In the following, we propose specific research hypotheses based on this integrated framework.

3 Hypotheses development

The first three research hypotheses elaborate on how a group-based presentation form enables a higher level of social presence than an individual-based presentation form, and on how such a sense of “being with another” [3, pp. 456] enhances multiple-facet review evaluations by consumers in terms of quality, understandability, and credibility.

First, review quality stands for consumers' perceived utility of review information in assisting with their purchase decisions. As mentioned, a group-based presentation form allows review information from individual consumers to be presented in collective forms, thereby eliciting a sense of social presence. Previous research has shown that consumers make inferences from the opinions of peer buyers who had a similar purchase experience when verifying product- or service-related information from an e-seller [11]. As such, the grouped review information tends to be processed as a whole and reinforces similar options from peer buyers.

According to selective information processing theory [15, 24, 41], when the grouped review information is mixed and complex, consumers are likely to focus on the hypothesis-consistent information and to neglect the hypothesis-inconsistent information. Thus, when review information is presented through a group-based presentation form, consumers are likely to experience stronger persuasive power on the review information that are consistent with their cognitive

schemas, such as whether a product or service is good, how good it is, and why. As a result, the consumers will find the collective evidences, as conveyed in the grouped review content, to be useful for judgements, that is, of high quality. In contrast, when review information is presented through an individual-based presentation form, consumers are likely to process individual reviews independently, as well as to find the reviews to be inconsistent and of low utility for their purchase decisions (i.e. of lower quality). In other words, when review information is presented in a group-based presentation form, it appears to be more useful in supporting the consumer decision-making process, as compared to the review information presented with the individual-based form. In addition, the previous literature suggests that social presence perceptions are positively associated with an individual's sense of commitment to a community, which in turn leads to effective knowledge exchange and learning [5]. Thus, we expect that the group-based presentation form induces higher perceptions of rich information flow and knowledge exchange among consumers than the individual-based presentation form, and propose:

H1 Consumers rate the same review information as being of higher quality with the group-based presentation form (i.e., high social presence) than with individual-based form (i.e., low social presence).

Second, review understandability is defined as the extent to which consumers perceived review information as being easy to appreciate and comprehend. Prior studies revealed that collective presentation and integration of information can effectively decrease information equivocality [69], and that a rich form of information presentation enhances consumers' psychological involvement in social interactions and helps them better absorb information and knowledge [48]. As such, we expect that grouped review information offers nuanced cues for the use experiences of products and services, and consequently enables the self-explanatory power of review information. When reviews contain different opinions, which are either contrasting or complementary, the collective presentation form enables consumers to construct a comprehensive understanding of the clustered information [48]. In contrast, consumers tend to find individual reviews with a mixed valance and scattered opinions difficult to understand [17]. In addition, consumers tend to find the group-based presentation form helpful in reducing their search cost for the desirable reviews, and the individual-based presentation form to be effort-consuming in identifying and absorbing key messages. Hence, while the individual-based presentation form tends to overwhelm and confuse consumers with flooded review information, the group-based presentation form mitigates information

equivocality and offers an easy solution for understanding product performance and problems [36]. We propose that:

H2 Consumers rate the same review information as being easier to understand with the group-based presentation form (i.e., high social presence) than with the individual-based form (i.e., low social presence).

Third, review credibility is the degree to which consumers perceive the review information to be sincere and trustworthy. Previous studies suggest that consumer perceptions of social presence stimulate their feelings of involvement and interaction with others, and enhance their trust in websites [30]. In a similar vein, the group-based presentation form presents review information based on clusters and induces a sense of interaction and discussions among consumers. Such interactions and a commitment to group discussions consequently reduce consumers' risk perceptions and nurture their trust in the review information. In addition, their sense of involvement in group discussions bolsters their confidence, as consumers, in the review information during the decision-making process [52]. Therefore, when consumers read review information as collectively presented viewpoints instead of as individual opinions, they tend to perceive a stronger vividness embedded in the online reviews and feel less uncertainty with the presented review information. Thus, we propose:

H3 Consumers rate the same review information as being more credible with the group-based presentation form (i.e., high social presence) than with the individual-based form (i.e., low social presence).

The next three research hypotheses propose the mediation effects of the three facets of review evaluation in quality, understandability, and credibility on the relationship between the two review presentation forms and consumer review adoption behavior, that is, the extent to which a consumer relies on the review information to make a purchase decision. Previous research has shown that consumers' adoption of review information is a function of its perceived helpfulness by the consumers [62]. In other words, high quality review information induced by a group-based presentation can address ambiguity and uncertainty in the product or service descriptions, and can offer deep insights into the product or service consumption process, as well as the post-sales service, which in turn contributes to the consumers' intention to adopt the review information. Hence, we propose:

H4 Consumer evaluation of review quality mediates the effect of review presentation form on consumer adoption intention, such that the group-based (vs. individual-based)

presentation form indirectly leads to higher (vs. lower) consumer adoption intention through review quality.

In addition, consumers are always cognitive misers who are motivated to save any effort possible during information processing [63, 72]. Review information that presents key messages collectively (i.e., via group-based presentation) are usually easy to understand and save the consumer much cognitive effort when information searching and processing. As such, consumers tend to be willing to rely on the review information that requires less of their cognitive resources when making a purchase decision. Therefore, given that the group-based presentation form is likely to improve the consumer evaluation of review understandability, we further propose:

H5 Consumer evaluation of review understandability mediates the effect of review presentation form on consumer adoption intention, such that the group-based (vs. individual-based) presentation form indirectly leads to higher (vs. lower) consumer adoption intention through review understandability.

Finally, credibility serves as another salient determinant of information adoption [81] and consumer decision outcomes [53, 77]. The higher level of trustworthy review information that induced by group-based (vs. individual-based) presentation rules out ambiguities and uncertainties in product or service descriptions and demonstrates strong persuasive power [26]. Consumers therefore tend to be willing to believe in such review information and that the review information can effectively assist their comprehensive judgments and correct decisions. As we have already established the link that group-based (vs. individual-based) presentation design tends to increase consumer perceived review credibility, we further propose:

H6 Consumer evaluation of review credibility mediates the effect of the review presentation form on consumer adoption intention, such that the group-based (vs. individual-based) presentation form indirectly leads to higher (vs. lower) consumer adoption intention through review credibility.

4 Study 1

In Study 1, we first performed both quantitative and qualitative pretests to validate the manipulation of social presence in the review presentation form, and then conducted the first experiment to examine the effects of individual- and group-based presentation forms with all the positive review content.

4.1 Preliminary validation on the manipulation of social presence in review presentation

As explained, the individual-based presentation form displays ten reviews separately; the group-based presentation form displays ten reviews in the same sequence, with the first review as the leading message and the balance as the reply messages from the first one. In other words, the two review presentation forms differed only in the individual- and group-based presentation formats; all review information was otherwise identical (see Fig. 2). We randomly selected review messages from the laptop product category from the year 2019 from Taobao.com. The valence of the selected reviews were all positive in order to avoid the effect of negativity bias [10] (see Sect. 5, in which Study 2 further incorporated the negative review content). The order of the ten reviews was randomly generated, but was identical for the individual- and group-based presentation formats. The review content length ranged from 99 to 104 Chinese characters (Mean = 101.30, SD = 1.42).

We obtained both quantitative and qualitative evidence to validate social presence as the key theoretical underpinning in the two presentation forms. First, we invited 20 college students from a campus of a top-tier university in China to participate in a pretest. Statistical reports have shown that college students constitute a significant portion of the online shopping population, and that no significant differences exist between students and other population groups in terms of their understanding and evaluation of online reviews [13, 36]. We presented the same review information in both the individual-based and group-based presentation forms to the twenty participants in a random sequence—ten participants read the review information that was first presented in the individual-based presentation form, and then in the group-based presentation form; ten others read the review information presented in the two presentation forms in a reversed order.

We followed the five-item measures of social presence from Walter et al. [73] and asked the 20 participants to rate the perceived social presence of the two presentation forms. The instrument evaluated social presence in terms of sociability, human contact, personalness, human warmth, and human sensitivity in the review information, and used a 7-point Likert scale, ranging from 1 = strongly disagree to 7 = strongly agree (see Table 1). The results showed that the individual- (Mean = 4.870, SD = 0.846) and group-based (Mean = 5.690, SD = 0.610) presentation forms exhibited significant differences in terms of perceived social presence ($t = 3.513, p = 0.001$).

Second, we conducted semi-structured interviews with another ten college students from the same campus. We presented the ten participants with the individual- and group-based presentation forms simultaneously, and all of them

Fig. 2 Experimental stimuli in study 1

Individual-based Presentation Form	Group-based Presentation Form
<p>商品评价: Product Reviews:</p> <p>用户0299: User 0299: Review 1 (Positive)</p> <p>一直比较关注这款笔记本, 外观很喜欢不像另外一款比较张扬! 手感不错类肤材质比较舒适, 但是不耐磨就不知道了。键盘键程较短且偏软, 键与键之间间距有点大, 方向键有点小。不过性价比还是比较高的, 第一次用希望耐用!</p> <p>用户6855: User 6855: Review 2 (Positive)</p> <p>我购买了20来天了感觉很赞。用起来手感不错, 电脑配置跟得上。外观漂亮, 按键舒服。开机速度18秒, 128固态加1T机械, 预装正版office、windows10, 运行流畅(目前为止), 机身较薄, 高清屏, 快递过来的包装很好, 当时购买价也算不错</p> <p>用户9653: User 9653: Review 3 (Positive)</p> <p>当然是正品啊, 拿到手一看就知道。电源适配器的线细(估计是工艺升级了, 方便携带)充电线是两孔的不是三孔插头。日常办公, 看看视频, 就是微微的热量, 这点很好, 不玩大型游戏是不用担心发热的。整体感觉很不错, 没有买亏!</p> <p>用户8224: User 8224: Review 4 (Positive)</p> <p>非常好, 用了很多天, 感受很不错, 颜值很高, 所到之处都引起围观; 屏幕的色彩和清晰度很惊艳; 携带方便, 触控板使用也便捷, 可以不使用鼠标了; 音响效果也不错, 开机速度超级快。物流也超级快, 总结就是良心之作!</p> <p>用户1846: User 1846: Review 5 (Positive)</p> <p>我觉得很好啊, 非常棒的质感。因为一直对触控板非常不放心, 没想到效果出乎意料地好。屏幕色彩和饱和度都很出色。对于笔记本, 尤其是轻薄本, 在声音方面从来没有奢求, 不过这款做得算是不错了。系统非常干净, 赞一个!</p> <p>用户6854: User 6854: Review 6 (Positive)</p> <p>卖家发货很快, 包装的特别专业, 收到后特别喜欢, 真的是高大上! 来的客人都夸赞他们也要买一台! 这几天用着很好用, 电脑配置好, 外观也不错, 性价比超高的! 如果有货马上入手一个配套鼠标会更好了, 一定给卖家好评!</p> <p>用户9452: User 9452: Review 7 (Positive)</p> <p>首先说物流, 京东没得说次日到。再说机器本身, 特意用了一周多评价的, 散热性能也很好, 接口的设计也恰到好处, 固态开机速度起飞, 性价比很高, cpu日常使用足够了, 网上还有教程升级cpu, 目前我打dota2没发现卡过。五星好评!</p> <p>用户5453: User 5453: Review 8 (Positive)</p> <p>我的话是对比其他好多电脑选了这款。按键比以前那款舒服多了, 屏幕色彩很好并未发现漏光, 固态硬盘开机超快 玩游戏也不卡而且比较轻巧 带出去装包里挺方便的 其他暂时没有问题 快递速度超快 而且包装的很好, 顺丰绝对放心</p> <p>用户4256: User 4256: Review 9 (Positive)</p> <p>包装很用心, 有两层保护膜; 拆开笔记本的触感很好, 开机设置了不少时间, 买的固态硬盘。目前开机只需9秒, 这个品牌极受办公室同事喜欢! 冲着品牌买的, 不错的购物体验, 电脑挺好, 客服态度也很好。收到的时候包装很好</p> <p>用户2144: User 2144: Review 10 (Positive)</p> <p>我是第一次上小船, 朋友推荐的, 这款性价比高, 实用性很好, 物流快。屏幕鲜艳很高清, 娱乐大师跑分17万。个人觉得外观很好。性能好。玩游戏最高特效轻松带过。泉水fps130到150, 喜欢打游戏的朋友推荐入手这款。用过就知道</p>	<p>商品评价:</p> <p>用户0299:</p> <p>一直比较关注这款笔记本, 外观很喜欢不像另外一款比较张扬! 手感不错类肤材质比较舒适, 但是不耐磨就不知道了。键盘键程较短且偏软, 键与键之间间距有点大, 方向键有点小。不过性价比还是比较高的, 第一次用希望耐用!</p> <p>用户6855:</p> <p>我购买了20来天了感觉很赞。用起来手感不错, 电脑配置跟得上。外观漂亮, 按键舒服。开机速度18秒, 128固态加1T机械, 预装正版office、windows10, 运行流畅(目前为止), 机身较薄, 高清屏, 快递过来的包装很好, 当时购买价也算不错</p> <p>用户9653:</p> <p>当然是正品啊, 拿到手一看就知道。电源适配器的线细(估计是工艺升级了, 方便携带)充电线是两孔的不是三孔插头。日常办公, 看看视频, 就是微微的热量, 这点很好, 不玩大型游戏是不用担心发热的。整体感觉很不错, 没有买亏!</p> <p>用户8224:</p> <p>非常好, 用了很多天, 感受很不错, 颜值很高, 所到之处都引起围观; 屏幕的色彩和清晰度很惊艳; 携带方便, 触控板使用也便捷, 可以不使用鼠标了; 音响效果不错, 开机速度超级快。物流也超级快, 总结就是良心之作!</p> <p>用户1846:</p> <p>我觉得很好啊, 非常棒的质感。因为一直对触控板非常不放心, 没想到效果出乎意料地好。屏幕色彩和饱和度都很出色。对于笔记本, 尤其是轻薄本, 在声音方面从来没有奢求, 不过这款做得算是不错了。系统非常干净, 赞一个!</p> <p>用户6854:</p> <p>卖家发货很快, 包装的特别专业, 收到后特别喜欢, 真的是高大上! 来的客人都夸赞他们也要买一台! 这几天用着很好用, 电脑配置好, 外观也不错, 性价比超高的! 如果有货马上入手一个配套鼠标会更好了, 一定给卖家好评!</p> <p>用户9452:</p> <p>首先说物流, 京东没得说次日到。再说机器本身, 特意用了一周多评价的, 散热性能也很好, 接口的设计也恰到好处, 固态开机速度起飞, 性价比很高, cpu日常使用足够了, 网上还有教程升级cpu, 目前我打dota2没发现卡过。五星好评!</p> <p>用户5453:</p> <p>我的话是对比其他好多电脑选了这款。按键比以前那款舒服多了, 屏幕色彩很好并未发现漏光, 固态硬盘开机超快 玩游戏也不卡而且比较轻巧 带出去装包里挺方便的 其他暂时没有问题 快递速度超快 而且包装的很好, 顺丰绝对放心</p> <p>用户4256:</p> <p>包装很用心, 有两层保护膜; 拆开笔记本的触感很好, 开机设置了不少时间, 买的固态硬盘。目前开机只需9秒, 这个品牌极受办公室同事喜欢! 冲着品牌买的, 不错的购物体验, 电脑挺好, 客服态度也很好。收到的时候包装很好</p> <p>用户2144:</p> <p>我是第一次上小船, 朋友推荐的, 这款性价比高, 实用性很好, 物流快。屏幕鲜艳很高清, 娱乐大师跑分17万。个人觉得外观很好。性能好。玩游戏最高特效轻松带过。泉水fps130到150, 喜欢打游戏的朋友推荐入手这款。用过就知道</p>

Table 1 Measurements

Constructs	Items	References
Social presence	There is a sense of sociability in the feedback; There is a sense of human contact in the feedback; There is a sense of personalness in the feedback; There is a sense of human warmth in the feedback; There is a sense of human sensitivity in the feedback	Walter et al. [73]
Review quality	I think the review information offered is relevant; I think the review information offered is informative; I think the review information offered is insightful	Moon [56], Sussman et al. [71]
Review understandability	The reviews are easy to comprehend; The meaning the reviews imply is clear and easy to follow	McKinney et al. [55]
Review credibility	I perceive that the reviews are credible; I perceive the reviews are sincere; I perceive the reviews are trustworthy	Sussman et al. [71]
Review adoption intention	What is the likelihood that you would adopt the reviews? How probable are you of adopting the reviews? To what extent do you agree with what the reviews talk about?	Filieri [23], Sussman et al. [71]

recognized the differences between the two presentation forms. Further, eight out of the ten participants perceived the group-based presentation form as being more “trustworthy” than the individual-based one; six of them felt the group-based presentation form offered “richer information.” As such, we obtained preliminary evidence that the group-based presentation form conveyed higher information credibility and quality than the individual-based presentation form.

4.2 Sample and procedures

We then proceeded to conduct the first experiment. We recruited 345 college students to participate in the experiment across three main settings, including classrooms, libraries, and dormitories from the same campus. To avoid the potential of a learning effect, all students who participated in the pretests were excluded in the first experiment. We retained 319 valid responses for the hypotheses tests, with an average age of 21.74 ($SD = 2.13$), and comprising 164 females (51.4%) and 155 males (48.6%). We conducted t-tests and found no significant differences in age and gender between (1) the retained valid sample ($N = 319$) and the ones screened out ($N = 26$) ($p_{age} = 0.470$; $p_{gender} = 0.606$); and (2) the group presented with group-based review information ($N = 160$) and the group presented with individual-based review information ($N = 159$) ($p_{age} = 0.341$; $p_{gender} = 402$).

We first informed each participant that their participation was voluntary and that they could withdraw at any time from the experiment. We then presented the participants with a QR code so that they could scan the code and read the review information that was organized along the two presentation forms on a random basis. We usually allocated five to ten

minutes for each participant to read the review information presented in the two alternative presentation forms. Upon reading the review information in full, the participants filled in a questionnaire to evaluate the review information along multiple facets and to indicate their adoption intention of the review information. Each participant received a small gift valued at less than RMB¥10 after they completed the questionnaire.

Table 1 provides details of our measurement instrument. All the items were reflective indicators and used the 7-point Likert scale, ranging from 1 = strongly disagree to 7 = strongly agree. We used the committee approach to translate the measures in four steps [74]. First, one senior IS doctoral student, who was a native Chinese-speaker but was fluent in English, translated the English questionnaire into Chinese. Second, one research assistant translated the Chinese questionnaire back into English. Third, one senior IS professor who was fluent in both English and Chinese compared the two versions of the Chinese questionnaire and refined the translation. Fourth, three other IS doctoral students and five undergraduate students helped proofread the Chinese questionnaire, evaluated the accuracy and quality of the translation, and further refined the wording of the measurements.

4.3 Data analysis

4.3.1 Manipulation check and psychometric properties

We first checked whether the experimental manipulation was successful and examined the validity of the constructs relating to the hypotheses. We used one item that asked:

Table 2 Psychometric properties in study 1

		Cronbach's alpha	Factor loading			
			RQ	RC	RU	RAI
Review quality	RQ1	0.801	0.821	0.185	-0.182	0.184
	RQ2		0.891	0.092	-0.056	0.112
	RQ3		0.602	0.399	-0.234	0.288
Review credibility	RC1	0.788	0.255	0.707	-0.206	0.232
	RC2		0.101	0.835	0.066	0.191
	RC3		0.153	0.789	-0.022	0.323
Review understandability	RU1	0.787	-0.138	-0.129	0.896	0.055
	RU2		-0.138	0.039	0.888	-0.021
Review adoption intention	RAI1	0.818	0.150	0.197	-0.022	0.841
	RAI2		0.198	0.253	-0.029	0.794
	RAI3		0.118	0.249	0.075	0.792

Table 3 Means and T-test results of the two review presentation forms in study 1

	Individual-based design	Group-based design	T-tests
Review quality	4.140 (1.153)	5.030 (0.903)	7.702***
Review understandability	5.613 (0.990)	4.966 (1.521)	-4.502***
Review credibility	4.190 (0.731)	4.930 (1.156)	6.853***
Review adoption intention	4.363 (0.778)	5.067 (0.908)	7.434***

Standard deviations are in parentheses. *P*-values: ***: $p < 0.01$

“I can reply to others’ reviews in the review system I just experienced.” with the 7-point Likert scale, ranging from 1 = strongly disagree to 7 = strongly agree. The result showed significant differences ($t = 26.586$; $p < 0.001$) between the individual- (Mean = 1.74; SD = 1.33) and the group-based (Mean = 5.67; SD = 1.32) presentation forms. Therefore, our experimental manipulation with the presentation form was successful.

We then used SPSS 24.0 to perform factor analysis with the principal component approach and varimax rotation method. Convergent validity is supported when items of a construct are loaded highly on the particular construct; factor loadings between 0.45 and 0.54 are considered as fair, 0.55–0.62 as good, 0.63–0.70 as very good, and above 0.71 as excellent [12]. Table 2 shows that all constructs’ factor loadings exceeded the excellent level of 0.70, except one that ranked as good (RQ3 = 0.602). Cronbach’s Alpha of the four constructs also met the standard of 0.7, indicating good construct reliability [57]. In addition, the discriminant validity among the four constructs was supported because the items of any construct loaded higher for the particular construct than for the other three constructs [14] (see Table 2). Therefore, all four constructs relating to our research hypotheses demonstrated good psychometric properties.

4.3.2 Hypotheses tests

The T-test analysis showed that consumers perceived review information as being of a higher quality ($t = 7.702$, $p < 0.001$) when presented with the group-based presentation form (i.e., high social presence) (Mean = 5.030, SD = 0.903), as compared with the review information presented through the individual-based presentation form (i.e., low social presence) (Mean = 4.138, SD = 1.153). Consumers also perceived the review information as being more credible ($t = 6.853$, $p < 0.001$) when it was presented through the group-based presentation form (Mean = 4.931, SD = 1.156), as compared with the review information in the individual-based presentation form (Mean = 4.189, SD = 0.731). On the contrary, consumers perceived review information as being less understandable ($t = -4.502$, $p < 0.001$) when presented in the group-based presentation form (Mean = 4.966, SD = 1.522) as compared with the review information presented in the individual-based presentation form (Mean = 5.613, SD = 0.990). Therefore, H1 and H3 were supported, but H2 was not (see Table 3).

We then conducted an OLS regression on consumer adoption intention of the review information (see in Table 4). The regression results showed that presentation forms ($\beta = 0.388$, $p < 0.01$), review quality ($\beta = 0.179$, $p < 0.01$),

Table 4 OLS regression results of the two review presentation forms in study 1

		Review quality	Review understandability	Review credibility	Review adoption intention
Review presentation form		0.958***	−0.787***	0.688***	0.388***
Review quality					0.179***
Review understandability					0.120***
Review credibility					0.367***
Control variables	Age	0.024	−0.007	0.071***	0.015
	Gender	−0.343***	0.192	−0.148	0.043
	Shopping experience	−0.063	0.086	−0.018	−0.042
	Product Knowledge	0.118	0.445***	0.218**	−0.041
R ²		0.191	0.102	0.163	0.409

Standard deviations are in parentheses. *P*-values: ***: $p < 0.01$. **: $p < 0.05$

understandability ($\beta = 0.120$, $p < 0.01$), and credibility ($\beta = 0.367$, $p < 0.01$) significantly influenced consumer review adoption intention with age ($p > 0.05$), gender ($p > 0.05$), shopping experience ($p > 0.05$) and product knowledge ($p > 0.05$) being controlled.

To examine the mediation effects, we conducted mediation analysis by using PROCESS in SPSS 24.0 (see in Table 5). We found significant mediating effects of review quality (indirect effect: 0.157, 95% confidence interval with 5000 bootstrap samples: [0.073, 0.247]), credibility (indirect effect: 0.272, 95% confidence interval with 5,000 bootstrap samples: [0.184, 0.374]), and understandability (indirect effect: −0.073, 95% confidence interval with 5000 bootstrap samples: [−0.131, −0.027]) on the impact of presentation form on consumer intention to adopt review information. The results revealed that the group-based presentation form improved consumer intention to adopt review information by increasing review quality and credibility, but discouraged consumer adoption intention by decreasing review understandability. Meanwhile, the direct effect of presentation form on consumer review adoption intention was also significant (direct effect: 0.348, 95% confidence interval with 5000 bootstrap samples: [0.172, 0.524]), which demonstrates a significant association between the group-based presentation form and consumer intention to adopt review information. The mediation analysis results remained consistent after controlling all covariates (i.e., age, gender, shopping experience and product knowledge). Thus, H4 and H6 were supported, but H5 was not.

4.4 Discussion

The results of Study 1 suggested that the group-based presentation form (vs. individual-based design) enabled consumers to sense a higher level of review quality and credibility, but decreased their perceptions of review understandability. Moreover, group-based design

(vs. individual-based design) led to higher intentions to adopt the reviews among consumers, which was mediated by their perceptions of review quality and credibility. However, the group-based design (vs. individual-based design) impaired consumers' review adoption intention by decreasing their perceived review understandability.

5 Study 2

In Study 2, we conducted another experiment to address the generalizability issue with Study 1. First, Study 2 considers tablets as the target experimental product, which differs from laptops, which were used in Study 1 [28, 31, 40]. Both laptops and tablets are common in the online shopping context and are used regularly in the daily lives of college students; moreover, both products have been widely considered in the prior IS research [37, 82]. Second, we tested the research hypotheses by incorporating both positive and negative review content to mimic an online shopping scenario that was closer to reality. Third, we shortened the review content in Study 2 in order to see if the negative influence of the presentation forms of review information on review understandability remain stable.

Table 5 PROCESS mediation analysis results in study 1

	Indirect effect	95% confidence interval (with 5000 bootstrap samples)
Review quality	0.157	[0.073, 0.247]
Review understandability	−0.073	[−0.131, −0.027]
Review credibility	0.272	[0.184, 0.374]

Table 6 Results of pretest in study 2

		Positivity score	Negativity score
Positive reviews	Overall	6.395 (0.762)	1.559 (0.887)
	Review 1	6.316 (0.765)	1.553 (0.677)
	Review 2	6.526 (0.716)	1.447 (0.714)
	Review 3	6.421 (0.815)	1.447 (0.750)
	Review 4	6.132 (0.767)	1.658 (0.804)
	Review 5	6.395 (0.630)	1.579 (0.936)
	Review 6	6.368 (0.871)	1.579 (1.091)
	Review 7	6.421 (0.712)	1.579 (0.963)
	Review 8	6.579 (0.712)	1.632 (1.037)
	F-value	0.804	1.364
Negative reviews	Overall	1.487 (0.939)	6.329 (1.140)
	Review 9	1.553 (0.817)	6.289 (1.024)
	Review 10	1.421 (1.042)	6.368 (1.244)
	F-value	1.490	0.523

Standard deviations are in parentheses. *P*-values: **: $p < 0.05$

5.1 Composition and validation of review information with mixed valences

We followed the J-shape distribution of online reviews proposed by Hu et al. [35] and included two negative reviews in every ten online reviews presented in the individual- and group-based presentation forms. We randomly selected twenty reviews for tablets from Taobao.com from the year 2020, and invited 38 college students from the same campus in Study 1 to participate in a pretest to validate the composition of the review information with mixed valences. Note that all participants in Study 2 were different from the ones in Study 1. The 38 participants were asked to rate their perceived valence of the twenty selected reviews, as well as the attractiveness of tablets and their attitudes toward tablets. Based on the results of the pretest, we selected ten reviews that were appropriate for the second experiment, including eight reviews with a positive rating and two reviews with a negative rating (see Table 6). We identified no significant differences between the eight positive and two negative reviews. The length of ten reviews ranged from 35 to 39 Chinese characters (Mean = 37.20, SD = 1.17), which was significantly shorter than the length of reviews considered in Study 1 ($p_{\text{length}} = 0.00$). We again randomized the order of the ten reviews, but kept their sequence identical in the individual- and group-based presentation formats (see in Fig. 3).

5.2 Sample and procedures

We then recruited 101 college students to participate in the second experiment across three main settings, including classrooms, libraries, and dormitories from the same campus. We excluded the participants in the pretest in the

second experiment to avoid the potential of a learning effect. All participants offered valid inputs; they had an average age of 23.08 (SD = 2.42) and consisted of 67 females (66.34%). The experimental procedures and the instruments were the same as the ones implemented in Study 1, thus we do not repeat them here. The participants also reported their shopping experience and product knowledge. Each participant received a small gift valued at RMB¥5 upon completing the questionnaire and were thereafter debriefed.

5.3 Data analysis

5.3.1 Manipulation check and psychometric properties

Again, we asked the participants to indicate “Whether the review system I just experienced enables reviewers to reply to others’ reviews?” with two answers, “yes” or “no,” as the manipulation check. When participants in the individual-based presentation condition answered “no” or those in the group-based presentation condition answered “yes,” the manipulations were considered as valid. We identified 91 cases that were successfully manipulated, with 41 in the individual-based presentation condition and 50 in the group-based presentation condition, and 10 failure cases. The t-test results showed no significant differences in age and gender between (1) the retained valid sample (N = 91) and the ones screened out (N = 10) ($p_{\text{age}} = 0.428$; $p_{\text{gender}} = 0.249$); and (2) the group presented with the group-based review information (N = 50) and the group presented with the individual-based review information (N = 41) ($p_{\text{age}} = 0.340$; $p_{\text{gender}} = 0.630$). In addition, the T-test results also showed that consumers perceived review information as being of higher social presence ($t = 2.186$, $p = 0.031$) when presented with the group-based presentation form (Mean = 4.776, SD = 1.059), as compared with the review information presented with the individual-based presentation form (Mean = 4.298, SD = 1.014).

We then applied the same analysis procedures as we did in Study 2. Table 7 shows that all constructs’ factor loadings exceeded 0.70, indicating excellent convergent validity [12]. Cronbach’s Alpha of the four constructs also met the standard of 0.7, indicating good construct reliability [57]. In addition, the discriminant validity among the four constructs was supported because the items of any construct loaded higher on the particular construct than on the other three constructs [14].

5.3.2 Hypotheses tests

We first conducted t-test analysis (see Table 8) and the results showed that (1) consumers who were presented with grouped review content (Mean = 5.420, SD = 0.911) perceived a higher level of review quality ($t = 3.871$, $p < 0.001$) than those presented with individual review

Individual-based Presentation Form

Group-based Presentation Form

商品评价: **Product Reviews:**

用户0299: User 0299: Review 1 (Positive)
厚度合适, 触感也不错, 速度快, 不卡顿, 这一款屏幕大小适中, 可以用来书写, 画画

用户6855: User 6855: Review 2 (Positive)
外观好看的呢, 音效非常的好, 正版全新未拆封, 价格优惠, 反应速度快, 性价比也高

用户9653: User 9653: Review 3 (Positive)
平板非常的漂亮, 完美, 屏幕视觉效果很好, 功能也很强大, 爱不释手, 特别棒!

用户8224: User 8224: Review 4 (Positive)
画质很清晰诶, 音质也好, 亮度极佳, 按键灵活, 运行速度很快, 不卡顿, 没有延迟

用户1846: User 1846: Review 5 (Positive)
触感很棒, 很轻便, 运行很流畅, 反应很快, 图像真实, 切换特快, 视频没有发现卡顿

用户6854: User 6854: Review 6 (Negative)
骗人的吧, 屏幕分辨率低, CPU速度慢, 用电快, 有时候还卡壳, 摄像机右侧有划痕掉漆, 退货了

用户9452: User 9452: Review 7 (Positive)
外观无刮痕, 播放视频非常清晰, 运行速度非常快, 非常薄, 充电速度快, 续航时间长

用户5453: User 5453: Review 8 (Negative)
价格太高, 运行速度一般, 充电接触不好, 会断续, 书写不流畅, 客服不解决实际问题

用户4256: User 4256: Review 9 (Positive)
很惊艳啊! 高端大气, 华丽, 顺畅, 拿着很轻薄, 拿起来看电子书也不觉得沉, 正合我意

用户2144: User 2144: Review 10 (Positive)
金色看起来就是大气, 画面唯美, 很惊艳, 触感很好, 对它爱不释手, 很不错的体验

商品评价:

用户0299:
厚度合适, 触感也不错, 速度快, 不卡顿, 这一款屏幕大小适中, 可以用来书写, 画画

用户6855:
外观好看的呢, 音效非常的好, 正版全新未拆封, 价格优惠, 反应速度快, 性价比也高

用户9653:
平板非常的漂亮, 完美, 屏幕视觉效果很好, 功能也很强大, 爱不释手, 特别棒!

用户8224:
画质很清晰诶, 音质也好, 亮度极佳, 按键灵活, 运行速度很快, 不卡顿, 没有延迟

用户1846:
触感很棒, 很轻便, 运行很流畅, 反应很快, 图像真实, 切换特快, 视频没有发现卡顿

用户6854:
骗人的吧, 屏幕分辨率低, CPU速度慢, 用电快, 有时候还卡壳, 摄像机右侧有划痕掉漆, 退货了

用户9452:
外观无刮痕, 播放视频非常清晰, 运行速度非常快, 非常薄, 充电速度快, 续航时间长

用户5453:
价格太高, 运行速度一般, 充电接触不好, 会断续, 书写不流畅, 客服不解决实际问题

用户4256:
很惊艳啊! 高端大气, 华丽, 顺畅, 拿着很轻薄, 拿起来看电子书也不觉得沉, 正合我意

用户2144:
金色看起来就是大气, 画面唯美, 很惊艳, 触感很好, 对它爱不释手, 很不错的体验

Fig. 3 Experimental stimuli in study 2

content (Mean = 4.642, SD = 1.004), and (2) the consumers who were presented with the grouped review content (Mean = 4.973, SD = 0.901) also reported a higher level

of perceived review credibility ($t = 3.237, p = 0.002$) than those who were presented with individual review content (Mean = 4.285, SD = 1.129). Thus, H1 and H3 were

Table 7 Psychometric properties in study 2

		Cronbach's alpha	Factor loading			
			RQ	RC	RU	RAI
Review quality	RQ1	0.888	0.867	0.103	0.015	0.285
	RQ2		0.897	0.167	0.020	0.087
	RQ3		0.828	0.071	0.014	0.341
Review credibility	RC1	0.934	0.165	0.886	−0.001	0.228
	RC2		0.086	0.926	0.088	0.122
	RC3		0.102	0.922	−0.017	0.235
Review understandability	RU1	0.931	0.088	0.041	0.946	0.192
	RU2		−0.057	0.007	0.945	0.209
Review adoption intention	RAI1	0.912	0.212	0.184	0.195	0.882
	RAI2		0.330	0.280	0.187	0.780
	RAI3		0.316	0.294	0.272	0.765

Table 8 Means and T-test results of the two review presentation forms in study 2

	Individual-based design	Group-based design	T-tests
Review quality	4.642 (1.004)	5.420 (0.911)	3.871***
Review understandability	5.768 (0.909)	5.340 (1.012)	−2.102**
Review credibility	4.285 (1.129)	4.973 (0.901)	3.237***
Review adoption intention	4.472 (1.291)	5.113 (0.895)	2.792***

Standard deviations are in parentheses. *P*-values: ***: $p < 0.01$; **: $p < 0.05$

Table 9 OLS Regression results of the two review presentation forms in study 2

		Review quality	Review understandability	Review credibility	Review adoption Intention
Review presentation form		−0.765***	0.434**	−0.730***	−0.287
Review quality					0.441***
Review understandability					0.452***
Review credibility					0.308***
Control variables	Age	0.009	0.022	0.009	−0.006
	Gender	−0.080	0.158	−0.047	−0.072
	Shopping experience	0.033	0.073	−0.134	−0.040
	Product knowledge	−0.137	−0.105	0.071	0.064
R ²		0.161	0.064	0.120	0.569

Standard deviations are in parentheses. *P*-values: ***: $p < 0.01$; **: $p < 0.05$

supported. However, the reviews in the group-based presentation (Mean = 5.340, SD = 1.012) were rated as less understandable ($t = -2.102$, $p = 0.038$) than the content featured in an individual-based presentation (Mean = 5.768, SD = 0.909), which did not support H2.

We then performed an OLS regression analysis (see in Table 9). The results showed that consumers' perceptions of review quality ($\beta = 0.484$, $p < 0.001$), review understandability ($\beta = 0.412$, $p < 0.001$), and review credibility ($\beta = 0.344$, $p < 0.001$) significantly led to review adoption intention, controlling for age ($p > 0.05$), gender ($p > 0.05$), shopping experience ($p > 0.05$) and product knowledge ($p > 0.05$).

Table 10 PROCESS mediation analysis results in study 2

	Indirect effect	95% Confidence interval (with 5000 bootstrap samples)
Review quality	−0.338	[−0.563, −0.146]
Review understandability	0.190	[0.019, 0.381]
Review credibility	−0.218	[−0.445, −0.055]

Finally, we performed a mediation effect analysis (see in Table 10). We found that the indirect effects of perceived review quality (indirect effect: -0.338 , 95% confidence interval with 5000 bootstrap samples: $[-0.563, -0.146]$), review understandability (indirect effect: 0.190 , 95% confidence interval with 5000 bootstrap samples: $[0.019, 0.381]$), and review credibility (indirect effect: -0.218 , 95% confidence interval with 5000 bootstrap samples: $[-0.445, -0.055]$) were all significant. Consumers presented with grouped review content displayed a higher intention to adopt the review than those who were presented with individual review content, and such effects were mediated by increased review quality and credibility. Thus, both H4 and H6 were supported. However, the group-based presentation form mitigated consumers' intention to adopt reviews through impaired review understandability to a greater extent than the individual-based presentation form. Thus, H5 was not supported. Meanwhile, the direct effect of presentation forms on consumer review adoption intention turned out to be non-significant (direct effect: -0.275 , 95% confidence interval with 5000 bootstrap samples: $[-0.648, 0.098]$). These results remained stable when all covariates (i.e., age, gender, shopping experience and product knowledge) were controlled.

5.4 Discussion

The results of Study 2 were consistent with those in Study 1. We found that the group-based presentation of review content (vs. individual-based) increased consumers' perceptions of review quality and credibility, but decreased their perceptions of review understandability. Moreover, the mediation effects of the perceived review quality, understandability and credibility remained robust in Study 2, where we incorporated review content with mixed valences. Specifically, compared with the individual-based form, the group-based presentation of review content enhanced consumers' intention to adopt reviews by increasing their perceptions of review quality and credibility, but mitigated their adoption intention by decreasing the perceived review understandability.

6 General discussion

This study aims to investigate how presentation form can elicit the sense of being with others, thereby influencing consumers' evaluation and adoption intention of review information in the online shopping context. Drawing on social presence theory, we design two types of review presentations with individual- and group-based presentation formats. The individual-based presentation form presents online reviews one by one; the group-based presentation form clusters individual reviews and provides a sense of collective viewpoints,

group interaction, and social presence. We further identify three facets of consumers' evaluations of review information, that is, review quality, understandability, and credibility, and propose an integrated framework of the review presentation form. This integrated framework accounts for the influence of social presence perception, which is realized through presentation form, on consumers' evaluation and adoption intention of review information. The results across the two studies showed that consumers who used the group-based presentation form (i.e. high social presence), compared with those who used the individual-based presentation form (i.e. low social presence), evaluated the review information as being of higher quality and more credible. Contrary to our expectation, the review information that was featured through the group-based presentation form was perceived as being less understandable than the reviews arranged in an individual-based presentation form. Further, consumers were more likely to adopt the review information presented in the group-based (vs. individual-based) form, which were mediated through higher levels of review quality and credibility, but were less likely to adopt reviews due to a lower level of review understandability. The possible reason for the negative relationship between social presence perception and consumers' perceptions of review understandability is that, when consumers read and make sense of clustered review information from different individuals, they are motivated to understand the nuanced logical relationships among the leading and reply messages. Thus, they are more likely to experience a high level of cognitive dissonance [33]. Next, we discuss the theoretical and practical implications of our findings.

6.1 Implications for theory and practice

First, this work extends the understanding of how online reviews affect consumer evaluations and behavior through the lens of technology design. Previous research has typically examined (1) the impacts of review information content or context on review helpfulness, consumer risk perception, and product sales [10, 25, 31, 44] or (2) the impacts of technology design on consumer loyalty, shopping experience, and adoption behavior [16, 34, 43]. Very few works have addressed the gap to bridge online review and technology design. In addition, researchers in both IS and marketing usually refer to social psychology theories with an individual-based focus [34, 43, 45, 54]; few attempts have been made to investigate how online reviews featured in different presentation forms would foster a sense of being with others. To the best of our knowledge, we are among the first to investigate how presentation form can induce a sense of social presence and can influence consumers' evaluations and adoption of review information. Specifically, the group-based presentation form presents individual pieces of review

Table 11 Summary of theoretical implications

Key insights of our study	Theoretical implications
Experimental manipulation on review presentation form <ul style="list-style-type: none"> • Individual-based (i.e., low social presence) • Group-based (i.e., high social presence) 	<ul style="list-style-type: none"> • <i>Extend the understanding of how online reviews affect consumer evaluation and behavior through the lens of technology design</i>
Consumer evaluation on review information <ul style="list-style-type: none"> • Review quality • Review understandability • Review credibility 	<ul style="list-style-type: none"> • Enrich the literature on consumer evaluation of review information, that is, multiple facets rather than single facet
Research hypotheses <ul style="list-style-type: none"> • The influences of review presentation form on consumer evaluation on review information (H1, H3 supported; H2 not supported) • The mediated associations between review presentation design and information adoption through three-facet review evaluation (H4, H6 supported; H5 not supported) 	<ul style="list-style-type: none"> • <i>Offer an integrated framework of review presentation form</i> • Highlight the role of social presence theory in instructing technology design to collectively present information from individual users • Reveal the mediation effects of the three-facet review evaluation in the relationship between review presentation form and information adoption

information collectively, with one as the leading message and the others as following messages. Such an innovative review presentation form offers a new angle for understanding the power of technology design in materializing and maximizing the persuasive effects of review information among consumers.

Second, we contribute to the IS literature relating to social presence theory by disclosing its power in informing technology design from the original lens of “being with another” in the virtual context. Previous research has mainly investigated how user perceptions of social presence toward a given technology drive their technology use behaviors [39, 70] or how to mimic human beings (i.e., anthropomorphism) through technology design and induce consumers’ purchase intentions [32, 61]. Very few efforts have been devoted to the potential power of technology design that *truly realizes “being with another”*—the collective presentation of online information from independent users who are supposed to have limited communications and interactions. Specifically, our findings demonstrate that the sense of social presence elicited through the group-based review presentation form effectively promotes consumers’ review adoption intention through the enhanced evaluation of review quality and credibility. It is also noteworthy that the group-based presentation form impedes consumers’ review adoption intention by decreasing review understandability. Thus, our findings highlight the double-edged effects of social presence, as elicited by review presentation design, on consumers’ review adoption intention.

Third, we offer an integrative framework for the review presentation form. The extant literature offers rich knowledge concerning how consumers are motivated to adopt review information with different characteristics [36, 60, 71, 81], but there are few works that offer a unified viewpoint. We synthesize insights from the extant information adoption studies that usually cover one [42, 78] or two facets [36, 81] of the review evaluation. Specifically, we adopt a

multiple-facet approach and propose three aspects of consumer evaluation on review information, that is, review quality, understandability, and credibility. More importantly, we find that the senses of social presence nurtured by the group-based review presentation form led to a higher adoption intention of review information by enhancing consumer perceptions of quality and credibility of review information, but decreased the adoption intention by undermining the degree of review understandability. As such, our findings highlight the controversial influence of social presence in the review information presentation form on consumers’ review adoption intention through the dynamic mediations of multiple-facet review information evaluation. Table 11 summarizes the key insights and corresponding theoretical implications of our study.

Our study also yields important implications for managers. First, we introduce an innovative form of review presentation, namely the group-based presentation form. Unlike the traditional individual-based presentation form, the group-based form presents online reviews in clusters, with an initial piece of review information as the leading message and other pieces as the following messages. Our findings suggest that the group-based presentation form leads to improved review quality and credibility, but decreases understandability as perceived by consumers. Therefore, e-commerce managers or e-tailers are encouraged to adopt this innovative tool with caution when using it to harness the persuasive power of online reviews. For example, the lower understandability of grouped review information is attributable to a lack of genuine dialogues among the review messages. As such, e-commerce platforms applying the group-based presentation form are advised to employ algorithms or other methodologies to assign grouped reviews in a way to improve the logical connections among the review messages as “replies to one another”.

Second, we introduce an innovative review presentation form for small- to medium- sized e-tailers to artificially

present a limited amount of orders and reviews, and elicit a sense of social presence among potential buyers. Most e-commerce platforms encourage consumers to refer to prior reviews and offer a hybrid form of individual- and group-based presentation, which results in fewer opportunities for start-up sellers to attract potential buyers and motivate them to write reviews. Our findings not only demonstrate the superiority of the group-based presentation in enhancing consumers' evaluations and adoption intention of the review content, but also offer an alternative way for e-commerce platforms to nurture a vivid sense of group discussion without counting on consumers' voluntary participation.

Third, our study offers a unified framework of review presentation forms for website designers. While the group-based presentation form demonstrated controversial impacts in enhancing perceived review quality and credibility while impeding understandability, all three aspects of consumer evaluation on review information motivated consumer adoption intention of review information. As such, when incorporating social elements in the review presentation forms, web designers are advised to balance their use of the traditional individual-based and the proposed innovative group-based presentation forms, so as to boost consumer confidence in the review information as well as potential sales.

6.2 Limitations and future research directions

We discuss several limitations with this study, which offer opportunities for further research. First, our experimental samples were college students from one top-tier university in China. Although empirical evidence has extensively shown that college students constitute a representative and significant portion of e-commerce consumers and that China is a country of leading Internet unicorns,³ we suggest that future studies replicate our group-based presentation form in real e-commerce settings and across different cultural contexts. Second, future research may extend our efforts to address the ambivalent influences of social presence on consumer perception, evaluation, and behavior. For example, future endeavors may look up the potential boundary conditions of group size (i.e., ten review messages in the group-based presentation form in this study) or the perceived dialogue genuineness (i.e., artificially grouped in this study) for the negative relationship between consumer perceptions of social presence and review understandability. Researchers can also expand our research framework beyond review adoption intention. In a post-purchase context, scholars can

investigate if such a group-based review information presentation can motivate consumers' participation intention to add more review content. Third, the three facets of review information evaluation, namely review quality, understandability, and credibility, are assumed to be independent from each other in our study. Therefore, we suggest that future studies extend our findings by taking into consideration of their interdependence [23, 55]. Finally, given that we are among the first to design an online information presentation through the social presence lens (i.e., group-based presentation design), future research can continue this endeavor by incorporating the social presence element into technology design in wider research topics and contexts (e.g., film, crowdfunding, virtual communities).

7 Conclusion

Our study proposes an innovative review presentation form, that is the group-based presentation form, where individual pieces of review information are presented collectively. The persuasive power of the group-based presentation form is informed by social presence theory and is empirically verified in our experiment. Compared with the traditional individual-based presentation form, the group-based presentation form elicits higher levels of social presence as well as stronger perceptions of review quality and credibility among consumers. At the same time, it is shown to reduce review understandability. This study significantly advances the knowledge on the impacts of technology design on human–computer interactions, consumer behavior, and information adoption.

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