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The Effects of Culture on Consumers' Consumption and Generation of Online Reviews

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Abstract

In the globalized industry of online travel agencies, it is well known that providing culturally customized reviews can attract more customers by sharing similarity-oriented experiences. Given the importance of culturally customized reviews, if national cultures lead to systematic differences in the review generating process, it is necessary to examine whether culturally customized information would be useful in customers' decision-making processes and whether customers prefer online travel agencies providing such information. The objective of this research is to investigate whether (1) culturally customized review information based on nationality might have an influence on consumers' intention to recommend an agency, and whether (2) cultural differences have differential impacts on review posting in terms of the valence and dispersion of review ratings and textual contents of reviews. We find that customers from Western societies, such as the U.K. and the U.S., tend to be positively predisposed and that the dispersion of their ratings is significantly less for hotels in Beijing where they stayed compared to that of Chinese customers. Furthermore, using two experimental surveys, we reveal that customers regard the average review rating from review posters with same cultural background as more useful than those from all reviewers in their decision-making process.

Keywords: Consumer online review; Review rating; Textual contents of review; Cultural difference; U.K. consumers; U.S. consumers; China consumers

Introduction

Since consumers, as 'prosumers', not only passively read and consume the information provided by others but also actively generate their own feedback and contribute to increasing shared knowledge on review websites (Hennig-Thurau et al. 2004; Vasquez 2014), review generation and review consumption are closely linked (Yang et al. 2012; Yun, Park, and Ha 2008). In the business realm, as the online travel market grows worldwide and becomes more crowded, online travel agencies (henceforth, OTAs) are making various efforts to satisfy consumers from different countries by providing customized services, such as multiple review search options, to simultaneously consider the links between review generation and review consumption (Hong et al. 2016). For example, some OTA online travel websites such as Booking.com and TripAdvisor.com provide the customized option to sort reviews according to national background factors such as currency used, language, and nationality of review posters. Booking.com has established a new default review option that automatically provides the registered customers with reviews from the country under which they register. This option would function as an element that improves the consumer's credibility and satisfaction with the review site and, in turn, contributes to the profit of the site.

However, the understanding of the roles of cultural backgrounds in the connection between review generation and review consumption has never thoroughly been researched in any of the previous studies. Since differences in the cultural backgrounds of consumers are likely to be able to play a critical role in review generation, as well as review consumption, this study attempts to simultaneously examine the effects of the different cultural backgrounds on review generation (posting)

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and explore the impact of national culture-based reviews on review consumption (reading).

Many of the existing studies on online reviews have documented the impacts of valence, which is the affective response (Chevalier and Mayzlin 2006; Li and Hitt 2008), and the influences of variance, which is the average of the squared differences from the mean (Sun 2012; Zimmermann et al. 2017), on consumer decision making because these two elements provide a clear picture of the shape of customer review distribution.

Accordingly, we examine the impacts of cultural background on the valence and the variance of online reviews. In addition, we explore the impacts on textual content of reviews because textual content is likely to reflect both elements (Wu et al. 2015). Accordingly, we are able to understand overall roles of cultural background in the review generation process.

However, prior studies on review consumption usually discover the business values of reviews, such as the influence of reviews on the decision-making process, and examine what factors make customer reviews helpful (Kumar and Benbasat 2006; Mudambi and Schuff 2010). Since the usefulness of reviews hinges on how a consumer evaluates the value of reviews, it is regarded as a measure of how influential the reviews are in customer decision-making (Jiang and Benbasat 2004, 2007; Pavlou and Fygenson 2006; Pavlou, Liang, and Xue 2007). Thus, we investigate how cultural backgrounds affect the perceived usefulness of reviews and consumer purchase intention. This perceived usefulness may speak to the benefits of providing the review search option based on national culture.

By uncovering the roles of cultural background in both review generation and consumption together, we can respond to a crucial research call in the context of online reviews (Kozinets 2016; Winer and Fader 2016). Kozinets (2016) emphasizes that current research on online word-of-mouth (henceforth, OWOM) needs to incorporate different cultural realities into consumer-generated reviews. Winer and Fader (2016) also suggest examining the heterogeneity of the underlying population and context, such as cross-cultural aspects, to fully understand the role of culture in the relationship between generating reviews and consuming reviews. In addition, this study might help managers of review sites and hotel managers develop customized strategies by uncovering the positive effects of customized information based on cultural backgrounds.

We begin with a thorough literature review on OWOM and explore the relationship between OWOM and culture to develop cultural role-related hypotheses. Then, we examine the benefits of providing culturally customized information such as the consumer's intention to recommend. Next, we explore the systematic differences in review generation influenced by cultural backgrounds. Finally, we discuss conclusions, implications, limitations and future research directions.

Literature Review

The Dimensions of OWOM

OWOM helps prospective customers find products and services that fit their needs and preferences (Dellarocas 2003). Loaded with sufficient information on products and services, they are able to reduce uncertainty and search costs, reaching a better purchase decision (Brynjolfsson and Smith 2000). Prior literature has explored diverse impacts of OWOM on marketing variables such as consumer choice and sales in the review consumption process. For example, Chevalier and Mayzlin (2006) find that higher valence (ratings) is linked to higher sales. Ba and Pavlou (2002) show that negative reviews have a greater influence than positive reviews (negativity bias). Meanwhile, some researchers pay attention to the dispersion (e.g., variance) of review ratings because dispersion is a measure of the heterogeneity of consumer evaluations, and it helps companies understand how much consumers like or dislike their brands and products. According to Sun (2012), a higher variance contributes to a higher demand when the review rating is low. Together with this finding, the influence of the degree of variance on the usefulness of reviews and on purchase decisions has also been widely explored (Clemons, Gao, and Hitt 2006; Sun 2012).

Along with review rating, textual content (written reviews) is a major component of reviews, which provides detailed information about products to consumers and is an important factor in improving the usefulness of reviews (Mudambi and Schuff 2010; Yin, Bond, and Zhang 2014). According to a market survey conducted by Channel Advisor in 2010, 92% of consumers read or use the textual content of reviews before making a purchase decision online. In particular, review authors express their emotions through the textual content of review (Yin, Bond, and Zhang 2014). The emotions embodied by their words not only provide additional information related to the products to prospective consumers who read the reviews (Kim and Gupta 2012) but also contribute to shaping the attitudes of prospective customers toward products reviewed (Cohen et al. 2008) It, in turn, influences consumer purchase behavior (Das, Martinez-Jerez, and Tufano 2005; Jones, Ravid, and Rafaeli 2004). Yin, Bond, and Zhang (2014) examine the impact of textual content on the perceived helpfulness of reviews.

Despite the importance of the textual content of reviews, the roles of reviewer characteristics in the review generation process, such as cultural backgrounds, have not been thoroughly explored yet, particularly with respect to textual content (Hong et al. 2016). In this study, considering the importance of both the quantitative (ratings) and the qualitative (textual) aspects of reviews in the review consumption process, we examine the differences in the review generation process due to cultural backgrounds of review authors. Accordingly, we explore the effects of the generated differences on the review consumption process.

OWOM and Culture

OTAs such as TripAdvisor.com, Expedia.com and Booking.com are not only international websites that people from all over the world access to book hotels or flights but also places where consumers from a diversity of cultural backgrounds can share information and communicate with each other about their

experiences. OTAs are a place to generate OWOM. Since cultural backgrounds play roles in determining how consumers from the same culture meet their needs and their expectations (Ko, Seo, and Jung 2015; Monga and John 2007), it is necessary to understand what types of roles cultural backgrounds play in both review generation and review consumption (King, Racherla, and Bush 2014; Shankar and Meyer 2009).

Several previous studies have examined the impact of culture on review generation or consumption in online review sites, respectively (Fang et al. 2013; Koh, Hu, and Clemons 2010; Park and Lee 2009; Purnawirawan et al. 2015). For example, regarding review consumption, Purnawirawan et al. (2015) investigate whether culture plays a significant role in determining the effect of review valence on the perceived usefulness and purchase intention. Park and Lee (2009) found that national culture has a moderating impact on the relationships among the perceived usefulness of reviews and its antecedents, such as consumer susceptibility and internet shopping experience based on different scores on individualism and uncertainty-avoidance dimensions by Hofstede (1980). With respect to review generation, Koh, Hu, and Clemons (2010) examine whether collectivist-leaning societies have a tendency to place emphasis on harmony and thus write fewer excessively negative reviews than individualistic societies. Following the flow of prior literature, this study explores how collectivistic and individualistic tendencies contribute to the perceived helpfulness of reviews, as well as how those tendencies affect both the review ratings and textual content of reviews. This study will help to synthetically understand the role of national culture in review generation and consumption of online review websites.

Culture and Nation

Previous literature on the relationship between culture and opinion sharing behavior is primarily based on Hofstede cultural dimensions (1980, 2001) to form its theoretical basis. The cultural dimensions by Hofstede (1980, 2001) have been used extensively in much research in various fields. It shows that the U.S., the U.K., The Netherlands, and Australia rank highly on individualism, whereas China, Indonesia, Pakistan, and Korea are rank low. The U.S. and China are usually regarded as the representatives for the two distinct cultures. Between them, the U.S. has been considered as an example of Western culture and China represents the archetype of Eastern culture. The U.S. and Chinese cultural values have been shown to be different (Hofstede 1993). Because it is usually assumed that cultural values are reflected in country-level constructs shared by countrymen (Hong et al. 2016; House et al. 2004), we also formulate and evaluate our culture-related hypotheses using a country-level basis. As shown in Table 1, several studies, which investigate cultural differences in online review posting behavior use country-level constructs as archetype for corresponding cultural dimensions such as individualism vs. collectivism (Fang et al. 2013; Fong and Burton 2008; Hong et al. 2016; Pavlou and Chai 2002; Singh and Matsuo 2004; Singh, Zhao, and Hu 2003). Based on these prior studies and using the cultural dimension, individualism, we regard the U.K. and U.S. as individualistic and China and South Korea as collectivistic countries in this study.

Table 1
Summary of prior research on countries representing individualistic and collectivistic societies.

	Individualistic societies	Collectivistic societies
Pavlou and Chai (2002)	U.S.	China
Singh, Zhao, and Hu (2003)	U.S.	China
Singh and Matsuo (2004)	U.S.	Japan
Fong and Burton (2008)	U.S.	China
Fang et al. (2013)	U.S.	China
Koh, Hu, and Clemons (2010)		
Hong et al. (2016)	U.S.	China

Hypothesis Development

Culture and Review Consumption

Past research studies on the roles of culture in marketing examine the effects of cross-cultural differences on consumer decision-making and purchase behavior (e.g., Ko, Seo, and Jung 2015; Mazaheri, Richard, and Laroche 2011; Monga and John 2007). For instance, Japanese consumers who are used to a compact and minimalist environment can have a substantially different experience with the same hotel room from U.S. consumers who are used to spacious and extravagant surroundings. This difference suggests that the satisfaction level of consumers for the same services could be quite different, depending on their preferences encapsulated in national cultures. This procedure could also be applied to the review consumption process. When review readers acknowledge that a review poster shares similarities in preferences and attitudes (Postmes et al. 2001; Walther et al. 2012), they are more likely to evaluate the review as more useful (Ludwig et al. 2013). It is because review readers would assume that they will have similar experiences as those described in the reviews generated by someone with similarities. This phenomenon can be explained by the representativeness of heuristic, which occurs when people make a decision about an event under a haze of uncertainty, to reduce cognitive efforts and simplify the decision-making process (Kahneman and Tversky 1972).

Similarities in the preferences and attitudes for products can be inferred by travel profiles or characteristics of review posters. As culture reflects the shared preferences and attitudes of a population (Aaker and Schmitt 2001; Markus and Kitayama 1991), cultural background could function as a cue to promote implied similarity in preferences and attitudes. Consumers who read reviews generated by reviewers from similar cultural backgrounds would assume that those guests share similarities in preferences and attitudes with their own, resulting in the increased perceived usefulness of reviews. Tse, Belk, and Zhou (1989) support this notion by saying that "*culture may provide detailed prescriptions (norms) for specific classes of situations…*" (p. 82).

OTAs have introduced a national culture sorting option to their websites, and therefore, review readers can now sort reviews more easily according to nationality, promoting similarity inference (i.e., the same cultural background between themselves and the reviewers). This option signals representativeness (i.e., this review might represent my future experiences with this service), which contributes to efficient decision-making with minimal effort (Shah and Oppenheimer 2008).

Therefore, in regard to consumption behavior for online reviews, we conjecture that perceived cultural similarity between reviewers and consumers will elevate the value of posted reviews. Based on the above reasoning, we propose the following hypotheses:

H1. Review consumers are likely to regard the reviews from review posters with the same cultural background as more useful.

H2. Review consumers tend to evaluate the websites providing country-specific information of reviewers more highly than other sites.

Culture and Review Generation

As discussed in the review consumption section, if national homogeneity in the reviews plays a moderating role in the relationship between online reviews and their helpfulness to prospective customers, it would be interesting to examine whether review ratings and textual content are also influenced by cultural backgrounds, because differences in review ratings and textual content eventually affect review helpfulness (Wu 2013; Yin, Bond, and Zhang 2014).

To analyze the impact cultural background has on review generation, we focus on the quantitative aspect of reviews such as review valence (Chevalier and Mayzlin 2006) and rating dispersion (Cao, Duan, and Gan 2011; Hong et al. 2016). We further investigate whether the findings of the quantitative aspect of reviews are also applicable to the qualitative aspects such as textual content.

Positivity

Fong and Burton (2008) found that consumer discussion boards in the U.S. feature a more active resource of information compared to those in China, because of the individualistic versus collectivistic cultural aspect. Individualistic cultures foster more active self-expression and assertiveness compared to collectivistic cultures (Hofstede 2001; House et al. 2004). These differences would encourage people from individualistic cultures to prioritize the enjoyment of life and fun (Hofstede, Hofstede, and Minkov 2010), and foster a positive attitude and optimistic outlook (Hallahan, Lee, and Herzog 1997; Heine and Legman 1995). For instance, Lee and Sligman (1997) find that U.S. consumers maintain a more positive and favorable attitude toward life than Chinese consumers. Based on this literature, we hypothesize that consumers in an individualistic culture will generate more positive reviews compared with those from a collectivistic culture.

According to the scores for individualism in Hofstede's cultural dimensions, the U.K. and U.S. have relatively higher scores in individualism (U.K. = 89, U.S. = 91, respectively) while China has a lower score in individualism (China = 20). Therefore, we expect that U.K. and U.S. customers will maintain more positive attitudes when evaluating, compared to Chinese customers.

H3-a. U.K. customers tend to rate the same hotel services higher than those from China.

The differences between collectivistic and individualistic cultures could also affect the textual content of customer reviews. People who focus on negative aspects tend to show greater "anxiety", "anger", "worry", and "warning" in their verbal expressions (Cameron and Nicholls 1998; Sheese, Brown, and Graziano 2004; Smyth 1998). Conversely, people who are more positively predisposed tend to use words such as "love", "joy", "like", and "favor". Therefore,

H3-b. The textual content of reviews from U.S. customers contains more positive verbiage expressions when compared with reviews from Chinese customers.

Thinking Style

Social differences that exist among different cultures influence the nature of people's cognitive processes—the ways by which they know the world as well as their beliefs about specific aspects of the world (Nisbett et al. 2001). These thinking styles could be categorized as either holistic or analytic, depending on the cultural characteristics of the population (Nisbett et al. 2001). The differences in thinking styles influence the extent to which people consider the context in evaluations (Monga and John 2007), thereby affecting dispersion of review ratings. Specifically, analytical thinking demands objectivity and focus on the attributes of the object (Ji, Peng, and Nisbett 2000; Monga and John 2007). People from societies comprising primarily analytical thinkers will look upon an object separately, outside of its context. This phenomenon causes their evaluations of a service or a product to be little influenced by external factors. Holistic thinking, however, openly includes consideration of the environment in general. People with more holistic viewpoints have a tendency to view the world and themselves as interconnected and interdependent (Markus and Kitayama 1991; Nisbett et al. 2001). Recent research from cross-cultural psychology finds that East Asian societies are characterized as holistic and Western societies as more analytic thinkers (Ji, Peng, and Nisbett 2000; Monga and John 2007). East Asians are more likely to be influenced by their surroundings and peripheral cues, such as the weather of the day, moods of the day, and personal affairs, which may bring about a lack of consistency in service evaluations. This phenomenon can result in a wider dispersion of review ratings completed by Chinese customers. However, Western customers tend to see an object as independent of its context (e.g., Masuda and Nisbett 2001; Nisbett et al. 2001) and are therefore likely to evaluate a service or product without external influences. This tendency contributes to higher consistency in evaluations and may lead to less dispersion in review ratings completed by U.K. customers.

H4-a. The dispersion of review ratings left by U.K. customers tends to be lower than that of those by Chinese customers.

The different thinking styles between societies highly likely affect the textual content of reviews. According to Park and Lee (2009), Westerners tend to communicate with a logical, scientific, data-oriented, and direct style, whereas Asians, prone to holistic thinking, tend to communicate in a more intuitive, subjective, and generally less data-oriented fashion. A similar distinction between thinking styles has been supported by the notion of high and low context cultures, as discussed by Hall (1976). In high context cultures such as China, most communication relies more on context or is internalized by the person, and less information is expressed verbally in their word-selection, sentence structure, and phrasing (Hall 1976; Kim, Pan, and Park 1998).

Therefore, customers from Western societies, such as the U.K. and U.S., might reflect this attitude when writing reviews by using words related to objective language based on logical thinking. For example, expressions such as causal words (e.g., because, effect, hence) and insight words (e.g., think, know, consider) are more likely to be used.

However, Chinese customers tend to use subjective language when describing and evaluating their experience (Ji, Peng, and Nisbett 2000; Masuda and Nisbett 2001). Therefore, we expect that.

H4-b. U.S. customers are more likely to use predominantly analytical verbiage in their textual content compared to Chinese customers.

Study Overview

We conducted three studies (i.e., Pilot study, Studies 1A and 1B) to explore the effect cultural backgrounds have on consumers' review consumption behavior, and another two studies (i.e., Studies 2A and 2B) on consumers' review generation behavior. The pilot study provides preliminary evidence of the impact perceived cultural similarity has on reviews' usefulness/helpfulness. Study 1A more systematically compares two online travel agency service providers with or without an additional set of reviews generated by the same cultural group of consumers, reflecting the business practice of providing review search options on Booking.com, and shows the business value of cultural similarity matching using U.S. participants. Study 1B confirms the results of Study 1A with data using Korean participants. Study 2A examines different levels of positivity between individualistic and collectivistic cultures in the reviews' quantitative aspects (i.e., review valence and dispersion of review ratings). Finally, Study 2B addresses the qualitative aspect of reviews (i.e., textual content of reviews).

Pilot Study

The goal of the pilot study is to test whether cultural similarity between reviewers and consumers of online reviews enhances consumers' perception of the trustworthiness of reviews. We predict that reviews generated by the posters with the same national backgrounds as review readers would will be perceived as more helpful by those readers, presumably because cultural similarity can function as the representativeness of service experiences, making it easier for the review consumers to picture their own future experiences.

To examine our prediction, U.S. participants (N = 302, female 40.4%, M_{age} = 35.2) were recruited through Amazon Mechanical Turk in exchange for small monetary compensation. Participants were randomly assigned to one of the four conditions: 2 (hotel location: U.S. vs. China) × 2 (rating: $Rating_{U.S.} > Rating_{Chinese}$ vs. $Rating_{U.S.} < Rating_{Chinese}$) with a between-subjects design. To control any possible novelty effects of visiting a new country, we administer two cities in the U.S. (Dallas) and in China (Hefei). Participants were asked to imagine that they were navigating hotel alternatives in Dallas (a familiar location) or in Hefei (a novel location). They were presented with two average ratings generated by U.S. reviewers and Chinese reviewers, while the average ratings from U.S. reviewers were either higher or lower than those from Chinese reviewers (i.e., $Rating_{U.S.} = 4.0$ vs. $Rating_{Chinese} = 4.5$ or $Rating_{U.S.} = 4.5$ vs. $Rating_{Chinese} = 4.0$). Participants were asked to choose which group's average rating they thought to be closer to the actual quality of the hotel and more reliable.

The results reveal that, regardless of the location of the hotel, U.S. respondents perceived the average ratings given by U.S. review posters as more trustworthy. Specifically, they perceived the average ratings given by U.S. consumers to be closer to the actual quality of hotel (% = 83) and more reliable (% = 84) compared to those given by Chinese consumers.

It implies that consumers would more rely on the average ratings given by the review posters who are culturally similar to them, regardless of the magnitude of ratings and locations of the hotel.

The initial finding indicates that online travel agencies might benefit from operating review platforms that offer the cultural similarity matching between consumers and generators of reviews such as the national culture-based review default option on Booking.com. Therefore, in the main study, we examine whether cultural similarity between review posters and readers can improve consumers' perception of the helpfulness of reviews and enhance the intention to recommend the online travel agency, presumably by making it easier for consumers to envision how their experiences with each alternative would go.

Study 1A: Culture and Review Consumption (U.S. Participants)

Study 1A explores whether cultural-similarity matching between reviewers and readers can be beneficial for online travel agencies by testing H1 and H2. This more explicitly reveals the business value of providing culturally customized review options to prospective customers. The primary hypothesis to be tested is whether consumers who are provided with culturally matched reviews would evaluate the travel agencies more favorably. Accordingly, we also investigate whether cultural-similarity matching affects consumer decision making

on hotels. We conducted an experiment where participants are given two hypothetical online travel agencies that either offer or do not offer cultural-similarity matching. We artificially created the *single rating system* (i.e., ratings are from all review posters) and the *dual rating system* (i.e., additional ratings from only U.S. review posters were available).

Moreover, to observe how hotel choices are affected by the discrepancy between the ratings from all nationality review posters and from strictly U.S. review posters, in the control group, we manipulate no discrepancy between the ratings from all nationality reviewers and from U.S. reviewers in dual rating systems. Meantime in the treatment group, we allow a discrepancy between the ratings from all nationality reviewers and from U.S. reviewers in dual rating systems. Namely, we have a 2 (rating system: single vs. dual) × 2 (rating discrepancy: absent vs. present) within-subjects design. That is, all participants were exposed to the *single rating system* and to the *dual rating system*. Thus, we could more accurately identify the effects of providing consumers with a cultural matching system.

Method

Participants were asked to imagine that they were searching for hotels on a hypothetical online travel website and read the following scenario:

"You are going to make a hotel reservation for your U.S. supervisor's overseas business trip to Hefei, China. You have the final list of hotels on online travel website 'A'. The two hotels (hotel 1 and hotel 2) listed have similar prices and are in the same location. You are comparing average review ratings for each hotel to make a final decision."

Participants were shown the image of an artificial review page with two hotels on the hypothetical website with the single rating system. The website provided average ratings from all reviewers (i.e., no cultural-similarity matching). After seeing the review page, participants were asked to indicate the extent to which the website was perceived to be helpful, as well as the strength of their intention to recommend the website to others on 7-point Likert scales (1 = strongly disagree, 7 = strongly agree). They also answered which hotel they would personally choose. After that, they were shown the image of another website "B" with the dual rating system with the same scenario. Website "B" provided additional average rating supposedly given by only U.S. reviewers, representative of cultural similarity matching. The same questions were asked. Finally, participants indicated their gender and age.

The control group comprises 50 participants (female 72%, age: 20s = 54%, 30s = 34%, 40s = 6%, 50s = 6%) who observed the single rating system on website "A", (hotel 1: $rating_{All} = 4.0$, hotel 2: $rating_{All} = 3.0$) and with the dual rating system on website "B", (Hotel 1: $rating_{All} = 4.0$, $rating_{U.S.} = 4.2$; hotel 2: $rating_{All} = 3.0$, $rating_{U.S.} = 3.2$). For the no-discrepancy condition, we set both the rating from all nationality review posters and from strictly U.S. review posters to be identically controlled in the dual rating system: both all and U.S. customers evaluated hotel 1 higher than hotel 2 ($rating_{All} < rating_{U.S.}$). We allowed the average rating from all nationality reviewers to be lower than that from U.S. reviewers to reflect our empirical finding that U.S. customers are more generous in giving ratings. This empirical finding is addressed in Studies 2A and 2B.

The treatment group comprises 50 participants (female 63%, age: 20s = 36%, 30s = 40%, 40s = 10%, 50s = 12%, 60s = 2%) who were given the single rating system on website "A" (hotel 1: $rating_{All} = 4.0$, hotel 2: $rating_{All} = 3.0$) and the dual rating system on website "B" (hotel 1: $rating_{All} = 4.0$, $rating_{U.S.} = 3.0$; hotel 2: $rating_{All} = 3.0$, $rating_{U.S.} = 4.0$). Note that, for the discrepancy condition, we set the dual ratings on website "B" not to be identical in that U.S. reviewers rated hotel 2 more positively.

Results and Discussion

We conducted *paired t-test* analyses to test the effects of cultural similarity on the customer evaluation of an OTA's usefulness. The results show that participants perceived website "B" more helpful than website "A" in the treatment group (control: $M_{single} = 5.18$ vs. $M_{dual} = 5.30$, $p = .52$; treatment: $M_{single} = 5.06$ vs. $M_{dual} = 5.48$, $t = 2.45$, $p = .01$), supporting H1. That means participants only perceive the website providing a dual rating system as more helpful when the additional rating of reviewers from the same nationality is different from review ratings from all nationality reviewers. We find that participants are more likely to recommend the travel website "B" providing dual rating system in both the control group ($M_{single} = 4.52$ vs. $M_{dual} = 5.22$, $t = 3.67$, $p < .00$) and treatment group ($M_{single} = 4.20$ vs. $M_{dual} = 4.96$, $t = 3.18$, $p < .00$), supporting H2. This result indicates that participants tend to evaluate the website providing a dual rating system as more useful even when the additional rating of reviews from the same nationality is not significantly different from review ratings from all nationality reviewers. Taken together, our results suggest that OTAs can be perceived to be more helpful and be more favorably evaluated when they provide consumers with culturally matched rating information.

In addition, we found that almost all participants choose hotel 1 (97%) in the control group. This outcome was expected since U.S. customers and all nationality customers gave hotel 1 higher ratings than hotel 2. However, more importantly, we find that most participants (N = 82) changed their hotel choices, shifting from hotel 1 to hotel 2 in the treatment group. Note that hotel 2 was rated more highly by U.S. reviewers (hotel 1: $rating_{All} = 4.0$, $rating_{U.S.} = 3.0$; hotel 2: $rating_{All} = 3.0$, $rating_{U.S.} = 4.0$), and if participants rely more on the ratings from all nationality customers, they should have remained with the same hotel and have chosen hotel 1 as they did in the single rating system. This outcome means that participants put greater weight on ratings from U.S. than from all nationality customers. These findings imply that consumers are presumably more influenced by the rating information given by the review posters who signal cultural-similarity compared to aggregated consensus.

Study 1B: Culture and Review Consumption (Korean Participants)

The purpose of Study 1B is to confirm the results of Study 1A with Korean respondents. We duplicate the experimental design and procedure used for Study 1A. The only difference between two studies is the reviewers' nationality in the *dual rating system*. Accordingly, we manipulate that the rating was completed by Korean instead of U.S. reviewers.

Method

We recruited the Korean participants through the Tillion panel service in Korea, with the assistance of a slight monetary incentive. The control group comprises 57 participants (female 38.6%, $M_{age} = 38.1$) who give the single rating on website "A" (hotel 1: $rating_{All} = 4.2$, hotel 2: $rating_{All} = 3.2$) and the dual ratings on website "B" (hotel 1: $rating_{All} = 4.2$, $rating_{Korean} = 4.0$; hotel 2: $rating_{All} = 3.2$, $rating_{Korean} = 3.0$). We also allowed a slight difference in the average ratings from all nationality reviewers and from Korean reviewers to reflect our empirical findings that customers from collectivistic culture are more punctilious in giving ratings and the Korean society has lower score in individualism (South Korea = 18).

The treatment group comprises 54 participants (female 35.2%, $M_{age} = 38.7$). Note that the dual ratings in the treatment condition are not congruent with the single rating in that, although all review posters rated hotel 1 higher, Korean review posters rated hotel 2 higher. Specifically, they were given the single rating on website "A" (hotel 1: $rating_{All} = 4.2$, hotel 2: $rating_{All} = 3.2$) and the dual ratings on website "B" (hotel 1: $rating_{All} = 4.2$, $rating_{Korean} = 3.0$; hotel 2: $rating_{All} = 3.2$, $rating_{Korean} = 4.0$).

Results and Discussion

We conducted *paired t-test* analyses to test the effects of cultural similarity matching on customer evaluation of an OTA's usefulness. Similarly, with the results of Study 1A, we found that Korean participants perceived website "B" more helpful than website "A" in the treatment group (control: $M_{single} = 5.18$ vs. $M_{dual} = 5.30$, $p = .52$; treatment: $M_{single} = 5.06$ vs. $M_{dual} = 5.48$, $t = 2.45$, $p = .01$). They were also more likely to recommend website "B", which provided the additional Korean reviewers' rating in both the control group ($M_{single} = 4.96$ vs. $M_{dual} = 5.26$, $t = 2.98$, $p < .00$) and treatment group ($M_{single} = 4.88$ vs. $M_{dual} = 5.20$, $t = 4.00$, $p < .00$). More importantly, we confirmed that most participants (87%, N = 47) also shifted their preference from hotel 1 to hotel 2 on website B (dual rating system) in the treatment group.

Given the results of Studies 1A and 1B, we suggest that offering cultural-similarity matching between review posters and readers can benefit OTAs. It is even significant enough to affect consumer decision making on hotels. We found these results consistently across consumers in different cultures (i.e., individualistic culture, the U.S. and collectivistic culture, Korea), which implies that the advantage of accommodating additional information based on the review poster-reader cultural matching is not specific to a particular culture but generalizable to broad consumer populations.

In the next two studies, we address the roles of culture in the review generation process. Specifically, we focus on the cross-cultural differences between individualistic and collectivistic cultures to examine differences in consumer reviews from the perspective of quantitative (i.e., review ratings) (Study 2A) and qualitative (i.e., textual content of reviews) aspects (Study 2B) to test H3-a and H3-b and H4-a and H4-b.

Study 2: Culture and Quantitative and Qualitative Review Generation

Study 2 investigates how differences in cultural characteristics, such as an individualistic culture (i.e., the U.K.) and a collectivistic culture (i.e., China), have an impact on the quantitative (review rating) and qualitative (textual content of reviews) aspects of review generation behavior. In particular, we examine the impact the degree of positivity and the dispersion of consumer reviews have across the two different cultures.

Data Description

In this study, we collected online reviews from May 2014 to May 2016 using custom-made automated tools, written in "vb.net" to access and parse HTML and XML pages containing hotel information with online reviews on the travel website, Booking.com. The entire dataset comprises all the site's reviews with their review ratings for hotels in Beijing and London. In addition, we gathered the textual content of all English written reviews, for hotels in New York, left by U.S. and Chinese customers, to confirm whether the effects are also found in reviews' textual content.[1] The reviews' textual content comprises positive and negative expressions. These reviews are merged with hotels' information such as hotel address and star-ratings assigned by the site. The available pieces of information for each review are the following: reviewer nationality, review date, type of trip, travel companion specifics, and whether the review was posted from a mobile device. Our objective in this study is to identify the impact differences in cultural background between reviewers from the U.K., the U.S., and China have on review ratings as well as textual content of reviews in a non-experimental setting. The analysis is done by a regression approach for review ratings and the LIWC (Linguistic Inquiry and Word Count) method for textual content of reviews.

[1] Our reason for choosing textual contents of reviews from Chinese and U.S. customers is the issue of the number of observations. By using the Mahalanobis matching process to reduce sample selection bias, the number of observations can be significantly reduced. When we use the textual contents of reviews written in English for hotels in London by Chinese customers, the number of observations is insufficient to properly infer statistically meaningful results.

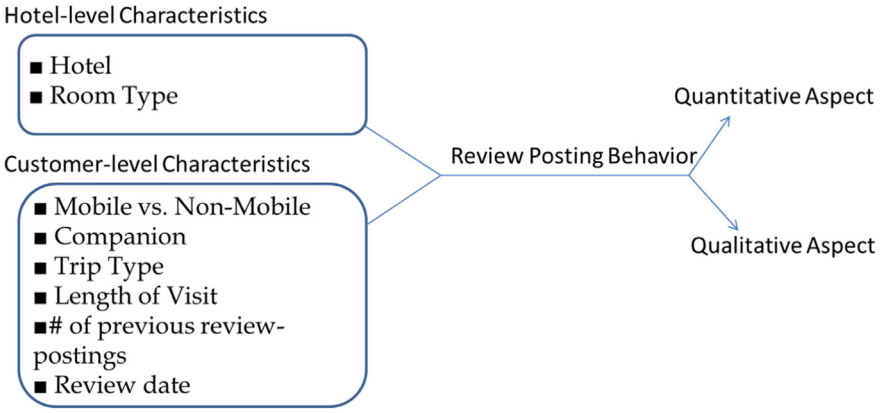

Fig. 1. Main characteristics to deal with sample selection bias.

Sample Selection Bias in the Non-experimental Setting

To identify the impact of cultural backgrounds on both sides (generation and consumption) of the review process by using non-experimental data, it is crucial to alleviate sample selection bias, which can be caused by the differences in the characteristics of reviewers' experiences. Such differences, together with cultural aspects, may jointly affect both sides of reviews. Therefore, it is critical to maintain ceteris paribus except for the difference in cultural background. In this study, we use a well-matched sample consisting of customers, who have two different cultural backgrounds. For our study, the Mahalanobis distance-matching method is extensively applied to prepare the samples of the two cultures; this step significantly reduces a potential sampling selection bias (Angrist and Hahn 1999; Flammer 2015; Friedlander and Robins 1995; Mihaela 2015; Rosenbaum and Rubin 1985; Sinclair, Stekler, and Carnow 2012). Specifically, we attempt to make the two groups as much alike to the other as possible by matching the observable characteristics of reviews, which have been known to have an impact on review posting behavior. These include both hotel- and customer-level characteristics, as shown in Fig. 1. The specific matching procedures for our research are discussed in detail in Study 2A. By reducing sampling selection bias, we separate the actual impact of differences in cultural background from the observed difference in review posting behavior between two different cultural groups.

Quantitative Aspects of Reviews—Valence and Dispersion of Online Ratings

If there were systematic differences in review generation behavior, due to the different cultural backgrounds between the U.K. and China, those differences would be reflected in the review distributions of customers from these countries. The distributions of customer reviews can be well summarized by the central tendency and the dispersion. Therefore, the first step is to compare the difference in the central tendency, the review scores, between the reviews of U.K. and Chinese customers. Second, to compare the differences in the dispersion of the distributions, we measure the absolute distance from the average review ratings of each national for each hotel.[2] This absolute distance has been frequently used in the prior literature (Hong et al. 2016; Wang, Zhang, and Hann 2017). To measure this distance, we calculate the average rating and the absolute distance of each review.[3] For example, there are five reviews of U.K. customers (j) for Hilton (l) in London. The review scores are assumed to be 5, 6, 7, 8, and 9. Then, the average rating for these reviews from U.K. customers is 7. However, the absolute distances for these reviews are 2, 1, 0, 1, and 2. The absolute distances of Chinese reviews (j) for Hilton (l) in London are defined the same way.

Qualitative Aspects of Reviews—Emotional Tone and Analytic Style in Online Narrative Reviews

To analyze the impact of cultural backgrounds on the textual properties of reviews, we pay particular attention to the following textual properties reflected in the reviews: positive emotion and analytical verbiage. To measure the degree of positive emotion and the level of analytical verbiage, we use two LIWC dictionaries including "emotional tone" and "analytic". LIWC is a widely used tool for identifying expressed sentiment, mood, etc. in written content (Pennebaker, Francis, and Booth 2001). LIWC has been applied to multiple forms of text, including even

[2] To compare the degree of review dispersion between the treatment and control groups, we need to calculate the distance of each review from the average review score. Therefore, we use the absolute distance for each review rather than some other measure, such as standard deviation.

[3] The average rating and the absolute distance are expressed by the equations below:

$$\text{Average\_Rating}_{jl} = \left(\text{review\_score}_{1jl} + \ldots + \text{review\_score}_{njl}\right)/n$$

$$\text{Absolute\_Distance}_{ijl} = \left|\text{review\_score}_{ijl} - \text{Average\_Rating}_{jl}\right|$$

where i = customer, j = treatment and control group, l = hotel.

online content such as blogs (Cohn, Mehl, and Pennebaker 2004), instant messaging (Slatcher and Pennebaker 2006) and anti-branding semiotics (Krishnamurthy and Kucuk 2009; Kucuk 2008). The marketing literature has also utilized this program to disambiguate sentiment in newspaper articles (Goes, Lin, and Yeung 2014; Humphreys 2010). It has the ability to calculate the prevalence of different word categories in any given body of text; this calculation is done using the percentage of words that can be matched to pre-defined keyword dictionaries (Pennebaker, Francis, and Booth 2001).

Analysis

To investigate the impact of differences in cultural backgrounds between the control and treatment groups on the quantitative aspects of reviews (valence and dispersion of ratings), we use the review score and absolute distance of each review (Hong et al. 2016; Wang, Zhang, and Hann 2017), respectively. The interest is placed on the "nationality" variable, which represents cultural backgrounds. To control the non-linear effect of the star-ratings on review score, we include a vector of dummy variables. Together with this, hotel-level dummy variables are included to control unobserved heterogeneity. To obtain robust estimates, we use the Huber–White sandwich estimator of variance. With both matched reviews, we estimate the following equations:

For the review valence,

$$\text{review\_score}_{ijl} = \text{S\_R}_l + \beta * \text{nationality}_{ijl} + \gamma * \text{X}_l + \varepsilon_{ijl}$$

For the dispersion of ratings,

$$\text{absolute\_distance}_{ijl} = \text{S\_R}_l + \beta * \text{nationality}_{ijl} + \gamma * \text{X}_l + \varepsilon_{ijl}$$

where i = customer, j = control and treatment group, l = hotel,

S_R is a vector of dummy variables that captures star-ratings,
X is a vector of hotel-level fixed effects,
ε_{ijl} is stochastic error term.

Table 2
Summary statistics of hotels.

Variables	N	Average of review score
Number of hotels	1,279	N/A
Number of unrated hotels	166	7.18
Number of 1.0-star hotels	5	6.50
Number of 2.0-star hotels	513	6.56
Number of 3.0-star hotels	248	6.90
Number of 4.0-star hotels	193	7.25
Number of 5.0-star hotels	154	7.98

Table 3
Summary of the distribution of customer reviews.

Variables	N	Score
Number of customer reviews (max = 10, min = 1)	82,311	N/A
Average of review scores	N/A	7.9
Lowest review score of the sample	N/A	2.5
Highest review score of the sample	N/A	10.0
25th percentiles of review scores	N/A	7.1
Median of review scores	N/A	7.9
75th percentiles of review scores	N/A	9.6

Variables	N	Percent
2.5 ≤ number of review scores ≤ 7.1	25,225	30.65%
7.1 < number of review scores ≤ 9.0	29,459	35.79%
9.0 < number of review scores ≤ 10.0	27,627	33.56%
Total	82,311	100%
Number of business trips	20,912	25.41%
Number of leisure trips	61,399	74.59%
Total	82,311	100%
Number of couples trips	24,224	29.43%
Number of family trips	12,803	15.55%
Number of group trips	14,412	17.51%
Number of trips with friends	102	0.12%
Number of solo trips	30,770	37.38%
Total	82,311	100%
Number of reviews left via mobile	28,903	35.11%
Number of reviews not left via mobile	53,408	64.89%
Total	82,311	100%

Study 2A: Quantitative Aspects of Reviews (U.K. vs. Chinese Consumers for Hotels in Beijing)

Study 2A investigates how differences in cultural backgrounds between the U.K. and China impact the quantitative aspect of review generation behavior. To examine the effect, we first use customer review data from hotels in Beijing.

Data Description

In Table 2, we provide the sample's summary description for the hotels in Beijing. As shown in Table 3, this sample comprises 1,279 hotels in Beijing, whose star-ratings (granted by Booking.com) represent the quality level of the hotels. Approximately 40% of the hotels have a 2-star rating, and approximately 27% of the hotels have a star rating greater than or equal to 4. The site has 166 of the sample hotels left unrated.

From Table 3, we can also see the customer review distribution for each hotel. Approximately 70% of the customer reviews have scored higher than 7.1, and approximately 75% of the reviews fall under the leisure trip category. We also find that a greater majority of people prefers traveling solo (37.38%) or as couples (29.43%). Some 35.11% of the 82,318 reviews were posted from a mobile device.

Matching Groups

As is evident in Fig. 1, many factors, including hotel-and-customer-level characteristics, might influence customer review

posting behavior (Ahn, Park, and Yoo 2017; Goes, Lin, and Yeung 2014; Huang et al. 2016). Therefore, without successfully controlling for these factors, it is quite difficult to eliminate the influence of selection bias on the estimated coefficients when we evaluate the impact of cultural backgrounds on review posting behavior.

To address this potential issue, we used a matching estimator by constituting the treatment and control groups based on the Mahalanobis matching method. This method is used to achieve the highest possible similarity between the control group and treatment group. The detailed procedure is explained in Appendix A.

Treatment Group

Primarily, the review data we use came from the hotels in Beijing (China). The treatment group comprises reviews left by U.K. customers who stayed at one of these Beijing hotels. The Mahalanobis matching method leaves us with 1,987 British customer reviews that satisfy our matching criteria.

Control Group

After making the control group as similar to the treatment group as possible using the Mahalanobis matching method, the control group comprises 1,987 reviews left by Chinese customers.

Analysis

We investigate the impact differences in cultural backgrounds between the control and treatment groups have on the quantitative aspects of reviews, valence and dispersion of ratings. To perform such an investigation, we use the review score and absolute distance of each review (Hong et al. 2016; Wang, Zhang, and Hann 2017), respectively. After calculating the scores and the absolute distances for both matched and treated reviews, we examine the impact of difference in cultural backgrounds, represented in different nationalities, by estimating the following equation:

$$\text{Dependent\_variable}_{ijl} = \text{S\_R}_l + \beta * \text{nationality}_{ijl} + \gamma * \text{X}_l + \text{error\_term}$$

where i = customer, j = control and treatment group, l = hotel,

S_R is a vector of dummy variables that captures star-ratings,
X is a vector of hotel-level fixed effects,
Dependent_variable = the review score or the absolute distance.

Results

The regression results for the review score are presented in Table 4. The first column shows the estimated coefficients for the regression, which include the nationality dummy proxying differences in cultural backgrounds between the U.K. and China, a vector of dummy variables for star ratings to control the non-linear effect of hotel quality on review scores, and hotel dummy variables to control hotel-level heterogeneity. In accordance with our expectations, we find that U.K. customers, on average, leave higher ratings than Chinese customers ($\beta_{nationality} = 0.22^{***}$). This outcome means that U.K. customers tend to maintain a more positive perspective when evaluating the services of hotels in China, empirically supporting H3-a.

The regression results for the dispersion of review ratings are also shown in Table 3, in the second column. The control variables are the same as those in the first column of Table 3. For the impact of nationality on the absolute distance, we find that the absolute distance of reviews authored by U.K. customers, on average, is less than that of those left by Chinese customers ($\beta_{nationality} = -0.17^{**}$). This comparison supports our hypothesis that dispersion of review ratings left by U.K. customers is lower than those by Chinese customers (H4-a).

Robustness Check

In this robust check, we attempt to determine whether our empirical results on the differences in review posting are caused by alternative reasons such as novelty or sample-selection except cultural backgrounds. In the first robustness check, we test whether the differences in ratings originate from a novelty or foreign effect, rather than from cultural differences. To test these differences, we look at the reviews of Chinese vs. U.K. consumers for hotels in London. In the second check, we investigate whether our findings could be still maintained when we compare the reviews from Chinese customers with customers from another country that is culturally similar to the U.K., based on Hofstede, Hofstede, and Minkov (2010). Therefore, we examine the differences in reviews between U.S. and Chinese consumers for hotels in Beijing.

Table 4
Differences in review score and absolute distance between the U.K. and China (hotels in Beijing).

	Dependent variable	
	Review score	Absolute distance
Nationality (The U.K. = 1, China = 0)	0.22*** (0.04)	−0.17** (0.02)
Hotel_Stars = not rated	8.95*** (0.13)	0.59*** (0.16)
Hotel_Stars = 2.0	5.78*** (0.86)	2.12*** (0.51)
Hotel_Stars = 3.0	7.51*** (0.54)	0.91*** (0.20)
Hotel_Stars = 4.0	9.28*** (0.22)	0.96*** (0.31)
Hotel_Stars = 5.0	7.63*** (0.60)	0.77*** (0.10)
Constant	No	No
Hotel dummy	Yes	Yes
R-squared	97.33%	65.36%
Observations	3,974	3,974

Robust standard errors are enclosed in parentheses. The coefficients are significant at levels ***<.01, **<.05, and *<.10.

Table 5
Differences in review score and absolute distance between the U.K. and China (hotels in London).

	Dependent variable	
	Review score	Absolute distance
Nationality (China = 1, The U.K. = 0)	−0.29*** (0.03)	0.05*** (0.01)
Hotel_Stars = not rated	7.02*** (0.68)	2.02*** (0.60)
Hotel_Stars = 1.0	7.59*** (0.45)	1.12*** (0.24)
Hotel_Stars = 2.0	8.14*** (0.86)	0.95*** (0.27)
Hotel_Stars = 3.0	6.79*** (1.08)	1.41 (0.96)
Hotel_Stars = 4.0	6.59*** (0.57)	1.14*** (0.47)
Hotel_Stars = 5.0	8.69*** (0.65)	0.56*** (0.18)
Constant	No	No
Hotel dummy	Yes	Yes
R-squared	96.72%	64.47%
Observations	8,960	8,960

Robust standard errors are enclosed in parentheses. The coefficients are significant at levels ***<.01, **<.05, and *<.10.

Table 6
Differences in review score and absolute distance between the U.S. and China (hotels in Beijing).

	Dependent variable	
	Review score	Absolute distance
Nationality (The U.S. = 1, China = 0)	0.20*** (0.06)	−0.07**(0.03)
Hotel_Stars = not rated	9.06*** (0.64)	1.46*** (0.44)
Hotel_Stars = 2.0	8.14*** (0.41)	1.26*** (0.28)
Hotel_Stars = 3.0	8.87*** (0.35)	1.85*** (0.45)
Hotel_Stars = 4.0	7.72*** (1.17)	1.71*** (0.53)
Hotel_Stars = 5.0	9.29*** (0.11)	0.67*** (0.10)
Constant	No	No
Hotel dummy	Yes	Yes
R-squared	97.08%	64.88%
Observations	2,718	2,718

Robust standard errors are enclosed in parentheses. The coefficients are significant at levels ***<.01, **<.05, and *<.10.

Chinese vs. U.K. Consumers for Hotels in London

The focus of this test is to confirm that the existence of a difference in reviews is still maintained when alternative explanations such as unfamiliarity or a novelty effect are allowed. For example, the differences in review ratings in Study 2A could be explained by the alternative theory that U.K. customers, who are most likely visitors and are unfamiliar with hotels in China, might have lower expectations for, and requirements of, those hotels and their services than Chinese customers. When travelers visit other countries, there is also the possibility that their mood is elevated by the fact of being in a novel environment of another country. For these reasons, we need to examine these alternative explanations to confirm whether the differences in review posting behavior between U.K. and Chinese customers are the results of differences in cultural backgrounds or one of the alternative explanations. One way to handle this issue is to use Chinese and U.K. customer review data from hotels in London. That is, if low-expectation due to unfamiliarity is the cause, Chinese customers who are visiting hotels in London might leave higher review ratings than U.K. customers because of their low expectations.

The treatment group comprises reviews from Chinese customers who stayed at one of the hotels in London. Using the same matching procedure, we are left with 4,480 Chinese customer reviews that met the mentioned matching criteria in previous study. The control group comprises reviews from U.K. customers who matched with the reviews of the Chinese treatment group.

Table 5 shows the regression results. What is shown in the first column is the estimated impact of differences in cultural backgrounds on review scores. Contrary to the explanation of low expectations due to unfamiliarity, we find that the review scores left by the U.K. customers are higher than those from Chinese customers ($\beta_{nationality} = -0.29^{***}$). This outcome provides evidence of a general tendency for Chinese customers to be more critical than their U.K. counterparts.

The regression results for a lower level of dispersion in the reviews among U.K. consumers are also confirmed in Table 5. As shown in the second column, depicting the impact of nationality on the absolute distance, we observe that the absolute distance of reviews left by Chinese customers has a tendency to be higher than that of those by U.K. customers ($\beta_{nationality} = 0.05^{***}$). This tendency means that there is less dispersion in ratings from U.K. customers than in ratings from their Chinese counterparts.

U.S. vs. Chinese Consumers for Hotels in Beijing

To ensure that our empirical findings do not stem from sample selection bias, we extend our comparison using another sample. To do this, we compare the reviews from Chinese customers and other nationals who are culturally similar to the British. We chose to use the U.S., because they can be put into the same category, according to Hofstede's study (1980, 2001). We use the same matching procedure to match the reviews from U.S. customers with those from Chinese customers.

The treatment group comprises 1,359 reviews left by U.S. customers who stayed in one of the hotels in Beijing (China). The control group is equal in size, but refers to reviews from Chinese customers, each of which was matched to a corresponding review from a U.S. customer.

We find that Chinese consumer ratings are still lower when compared to U.S. customers, as shown in Table 6. In addition, the absolute distance of reviews left by U.S. customers is lower than that of those by Chinese customers ($\beta_{nationality} = -0.07^{**}$), confirming that U.S. reviews are less heterogeneous in their evaluations than Chinese customer reviews.

The results from these two robustness checks confirm our findings from Study 1, providing evidence that the differences in ratings between two groups of customers from different national cultures are caused by cultural differences, instead of a novelty or sample-selection effect.

Table 7
LIWC summary language variables and examples.

Summary language variables	LIWC's definition	Examples
Emotional tone	High score means positive emotions and low number indicates "greater anxiety, sadness, or hostility"	(Positive emotion) Happy, nice, sweet, awesome (Negative emotion) Hate, annoyed, sad, grief, worried, nasty, ugly
Analytic	Formal, logical, hierarchical vs. informal, personal, narrative thinking	Because, reason vs. feel

Study 2B: Qualitative Aspects of Reviews (U.S. vs. Chinese Consumers for Hotels in New York)

In Study 2B, we test whether differences in cultural backgrounds between U.S. and Chinese customers have an impact on the textual content of reviews.[4] This study will confirm whether the findings in Study 2A are also consistently found in the qualitative aspects of reviews. By comparing the reviews written in English from the Chinese customers (treatment group) and the U.S. customers (control group) who stayed at hotels in New York, we are able to understand whether the quantitative and qualitative aspects are closely connected with each other.

Matching Procedure and Analysis

To make the two groups as similar as possible before we conduct the LIWC analysis, we use the same matching method (the Mahalanobis distance approach). We match each review in the treatment group on the basis of hotel-and-customer-level characteristics, as previously mentioned. These filtering procedures leave us with a total of 1,016 reviews—508 from Chinese customers and 508 from U.S. customers.

With the matched sample, we analyzed the textual content of reviews using LIWC. In particular, we delve into the two LIWC dictionaries, the summary language variables of "emotional tone" and "analytic", to serve as a proxy for "positivity" and "thinking styles" embedded in the textual content of reviews. LIWC's definitions and examples are shown in Table 7. As done by Ludwig et al. (2013), the automatic retrieval of the word count for emotional tone, referring to positive and negative words in the review text, produced their score for emotional tone; the same procedure was applied to the analytic score. For example, "like" would appear in the dictionary and be counted as 1 of the total number of positive emotional content words in the review. If the word "happy," which also belongs to the positive emotional tone dictionary, appears in the same review text, it would also be counted, making the total score for positive emotional tone 2. At the end of the content analysis, LIWC calculates the total number of times the dictionary words appear in a review, then this number is divided by the total number of words in the review to determine the percentage of the text that falls into a particular linguistic category such as emotional tone and analytic style, as suggested by Tausczik and Pennebaker (2010). The higher percentages for "emotional tone" and "analytic" mean that reviews contain a higher percentage of positive emotional and logical and analytical words, respectively.

After analyzing the contents of each review using LIWC, we compare whether these "emotional tone" and "analytic" aspects differ between the two groups using the same regression model as in Study 2A, where the dependent variables are the scores for "emotional tone" and "analytic". The textual content of each review comprises positive (pros) and negative (cons) experiences with hotel services. To robustly confirm the impact of cultural backgrounds on textual content, we run the regressions for both scores. Note that, as we mentioned, since the reviews are distinguished in terms of positive comments (pros) and negative comments (cons), we analyze "emotional tone" and "analytic" aspects in positive and negative comments, respectively.

Table 8
Differences in emotional tone in the textual content of reviews between U.S. and Chinese customers (hotels in New York).

	Dependent variable	
	Positive emotion (pros = positive aspect)	Positive emotion (cons = negative aspect)
Nationality (China = 1, The U.S. = 0)	−2.92* (1.66)	−4.12** (2.07)
Hotel_Stars = 1.0	63.84** (30.64)	46.82 (33.55)
Hotel_Stars = 2.0	100.46*** (1.44)	64.44** (27.81)
Hotel_Stars = 3.0	100.46*** (1.44)	27.83*** (1.95)
Hotel_Stars = 4.0	100.46*** (1.44)	64.44** (27.81)
Hotel_Stars = 5.0	63.84** (30.64)	52.06 (37.77)
Constant	No	No
Hotel dummy	Yes	Yes
R-squared	93.38%	70.50%
Observations	1,016	1,016

Robust standard errors are enclosed in parentheses. The coefficients are significant at levels ***<.01, **<.05, and *<.10.

Results

As expected, the prediction for "emotional tone" is confirmed by the results of the two regressions (Tables 8, 9). We found that both positive and negative aspects (pros = positive & cons = negative) of the reviews from U.S. customers have a higher level of emotional tone than those from Chinese customers, supporting H3-b ($\beta_{Chinese(pros)} = -2.92$, $\beta_{Chinese(cons)} = -4.12$, respectively). This outcome means that U.S. customers, compared to Chinese customers, are more likely to use the more positive words ("like", "love", "joy", "excited" and "favor") in their reviews when evaluating positive aspects (pros) of hotel services. Higher positivity in

[4] Due to the issue with the number of observations, we compare the textual content of reviews from U.S. and Chinese customers rather than those from British and Chinese customers.

Table 9
Differences in analytic tone in textual content of reviews between U.S. and Chinese customers (hotels in New York).

	Dependent variable	
	Analytic thinking (pros = positive aspect)	Analytic thinking (cons = negative aspect)
Nationality (China = 1, The U.S. = 0)	−2.55 (1.80)	−4.76** (1.98)
Hotel_Stars = 1.0	99.66*** (1.04)	44.72* (26.43)
Hotel_Stars = 2.0	64.51*** (1.29)	46.27 (32.60)
Hotel_Stars = 3.0	59.28** (29.06)	92.98*** (8.72)
Hotel_Stars = 4.0	91.15*** (8.41)	34.46 (25.03)
Hotel_Stars = 5.0	80.97*** (14.20)	31.57 (23.97)
Constant	No	No
Hotel dummy	Yes	Yes
R-squared	89.40%	85.08%
Observations	1,016	1,016

Robust standard errors are enclosed in parentheses. The coefficients are significant at levels ***<.01, **<.05, and *<.10.

the reviews from U.S. customers is also confirmed when they evaluate the negative aspects (cons) of their experiences. Even the score for the negative aspects (cons) of their experiences from U.S. customers is significantly higher than that from Chinese customers. The higher is the score for "emotional tone", the higher is the positivity. Chinese customers, compared to U.S. customers, are more likely to use more negative words (e.g., "hurt", "hate", "ugly", and "nasty") in their reviews when evaluating negative aspects (cons) of their experience.

With respect to "analytic" thinking style, as expected, the results show that the reviews from Chinese customers have lower scores for both positive (pros) and negative (cons) aspects than U.S. customers ($\beta_{Chinses(pros)} = -2.55$, $\beta_{Chinese(cons)} = -4.76$, respectively), although the coefficient for the positive aspect is not statistically significant. This outcome supports our hypothesis that reviews from U.S. customers are more likely to include words associated with logical and analytical thoughts, H4-b.

Even in the textual content of reviews, we found that there also exists a systematic difference in the level of positivity between the two consumer groups, consistent with our findings of quantitative reviews (Study 2A). This difference resonates with previous literature (e.g., Nisbett et al. 2001; Hofstede, Hofstede, and Minkov 2010) that suggest that individualistic cultures such as the U.K. and the U.S. are more inclined toward positivity compared to collectivistic cultures such as China and Korea.

General Discussion

The current research examines how national cultures influence the online review generation and consumption process. First, regarding the review generation, we find that customers from Western societies, such as the U.K. and the U.S., tend to be positively predisposed and that the dispersion of their ratings is significantly less for hotels they stayed at in Beijing when compared to Chinese customers. Similar results are found when both groups left review ratings for hotels they visited in London, negating an alternative explanation that attributes these findings to the novelty effect of Asians and Westerners when staying in a foreign country (e.g., when a Chinese national stays in a hotel in England). We also find that the narrative styles are significantly different between the two groups, represented by two major language variables, as the LIWC suggested (Pennebaker et al. 2015). Westerners are likely to be more positive in their emotional tone and more analytical in their narrative styles. Therefore, customers from Western cultures are inclined to be more positive and less affected by peripheral context in evaluating their experience.

Furthermore, using two experimental surveys, we investigate whether culturally customized information based on nationality positively influences review consuming behavior, which is closely related to OTA's marketing performance. The results reveal that U.S. respondents regard the average review rating from U.S. reviewers more useful in their decision-making process than ratings from reviewers with mixed nationalities. Therefore, we confirm that the nationality-based rating in the dual rating system has a significantly positive impact on marketing outcome variables, such as customers' intention of recommendation and hotel choice. All things considered, our study reveals that providing customers with culturally customized information can be critical for platform managers to increase customer loyalty.

Contributions

Our study has both theoretical and practical implications and limitations. Based on the limitations of this paper, we will discuss the future research directions. From a theoretical perspective, this article explores understudied aspects of the impact of cultural backgrounds on review posting and consuming behavior. Although customers have dual-status as prosumers (Vasquez 2014), little attention has been paid to the possibility that systematic differences in both review generation (posting) and consumption (reading) might arise due to differences in national culture. Our work can contribute to the area of user content generation, as well as literature touching online review platform design, in terms of available review options.

Specifically, according to previous studies on the effect of valence on the helpfulness of reviews, consumers perceive negative information as more helpful for decision making than positive reviews (Ahluwalia 2002; Chen and Lurie 2013; Wu 2013), but based on the results of our studies, customers are likely to perceive the reviews from customers of the same country more helpful, regardless of valence or volume of review. Therefore, the helpfulness of reviews is moderated by reviewers' and readers' cultural background. This outcome suggests that differences in cultural background can be an element, which affects the relationship between valence and helpfulness of a review as established in a previous study (Fang et al. 2013).

We also believe that our study has a methodological contribution. Most of the existing studies of cultural effects

on consumer reviews share methodological limitations such as sample selection biases, as noted by De Langhe, Fernbach, and Lichtenstein (2016). Thanks to the use of the Mahalanobis matching method, an econometric technique, we quite possibly remove the potential sample selection bias in observational data and are able to accurately compare the differences in review posting between countries after controlling other potential factors that might influence review posting (Flammer 2015). Furthermore, we utilize the Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al. 2015) to formally test for the existence of systematic differences in textual content of reviews.

With respect to practical implications, it is crucial that we improve our understanding of the possible unintended consequences of cultural differences regarding review-posting behavior, given the recent trend toward global OTAs having various online review platforms. We suggest that OTAs consider actively providing a culturally customized review option, which can serve to differentiate their OTA from others.

According to one of the main results of this study, consumers have more confidence in the average score from reviewers of the same nationality. As such, we suggest that providing customers with segregated scores rather than aggregated review scores, based on national culture, would be more helpful for online review sites and get them recognized as more helpful by customers.

Furthermore, these results can provide strategic implications not only for review websites but also for hotel owners and hotel managers, with respect to customization. For hotel managers, when establishing a marketing strategy to increase the revisit rate of consumers to their hotels, they should consider that consumers trust more the evaluation and preferences of their countrymen. In case of global hotel chains such as Hilton and Sheraton, it would be a better approach to advertise and promote their hotels in a particular country, by providing locals with customized reviews or evaluations emphasizing that customers from the same country prefer their hotels rather than customers from around the world. For example, it would be effective to use the advertising phrase such as “be loved by Americans” rather than “worldwide favorite hotel” for capturing U.S. consumer's positive responses or securing hotel choice.

This customized strategy can be used not only in advertisement but also in mailing services by putting country-specific reviews or evaluations of consumers from the same country, and in turn, it would increase positive attitudes of prospective consumers. Therefore, hotel managers can develop an effective way to increase consumer choice by using the benefits from preference-similarity of the same national culture.

Limitations and Future Research

Despite the contributions to both academic research and practice, our studies have some limitations. Based on those limitations, we will discuss future research directions.

Our findings do show that reviews written by Westerners are more homogenous than those left by East Asians, but we are unable to link any managerial implications to the dispersion of ratings. According to Ye, Law, and Gu (2009), variation in reviews will negatively affect hotel sales, although Park and Park (2013) find that high-variation reviews are more likely to raise the evaluation of a high-expectation product than those that are more unified. In addition, Sun (2012) discovers that higher variance would have positive influences on sales in a niche market. Our findings on high dispersion (left by Eastern customers) versus low rating dispersion (left by Western customers), caused by cultural differences, might provide some additional understanding to the effects of variance on the marketing variable. For future study, we need to further investigate the effects of high dispersion versus low rating dispersion of online reviews on marketing variables, such as customer choice and loyalty.

It is also important for future research to expand on our findings, i.e., the existence of consistent differences in user-generated ratings between Westerners and East Asians. It would be interesting for a future study to examine how summary ratings interact with the textual content of reviews; such interaction could help consumers in that they would receive more valuable information and be able to place greater trust in these sites. Another line of important future research, particularly based on the cultural differences in textual content of reviews, would be to examine which dimensions of services should receive more attention for Western customers vs. East Asian customers. Hotels are currently spending billions of dollars on managing their facilities and personnel to get customers visiting their websites and locations to increase their sales. Future research can shed light on how companies or hotels can manage their businesses by wisely customizing their business around different target groups, particularly Westerners and East Asians. Finally, it would be useful to explore how ratings are affected by the company's reputation or the hotel's star rating (e.g., 5-star hotel versus 3-star hotel). It also needs to be examined how the ratings are indirectly influenced by brand image, as empirically documented by De Langhe, Fernbach, and Lichtenstein (2016).

Appendix A. Matching Procedures with the Mahalanobis Method

Before conducting a matching procedure, we consider the set of Chinese customer reviews as the control group because matching procedure is conducted to match an observation in the treatment group to an observation in the control group. Accordingly, the number of observations in the control group should be greater than that in the treatment group to obtain a sufficient number of matched observations.

Therefore, we construct the control group of Chinese customer reviews and the treatment group of U.K. customer reviews by matching hotel-and-customer-level characteristics[5]

[5] The number of customer reviews from Chinese customers for hotels in Beijing is significantly greater than that left by U.K. customers. Therefore, we match U.K. customer reviews with a corresponding review from the control group of Chinese customer reviews.

in the Euclidean space (De Maesschalck, Jouan-Rimbaud, and Massart 2000). These groups comprise 1:1 matched observations between the treatment and the control groups. With respect to detailed matching procedure, we place the following restrictions.

For hotel-level characteristics, each review poster of the control and treatment group should stay in the same type of room as well as at the same hotel. A limited number of reviews of the control group are still able to be the potential candidates to be matched with each review of the treatment group after meeting the hotel-level characteristics. To select one review of the treatment group, we used individual-level characteristics such as companion, trip type, length of the visits, and device-type used for posting. We were left with far fewer reviews that matched very closely with the treatment group review. Finally, a single review of the control group is selected using the nearest Mahalanobis distance (Friedlander and Robins 1995) based on two customer-level characteristics: the number of previous reviews left by the customer and the review date. The Mahalanobis distance between a review of the treatment and one of the control group is calculated by the following:

$$MD^2 = (t.g.-c.g.)' \sum^{-1} (t.g.-c.g.)$$

where MD^2 is the Mahalanobis distance; *t.g.* is a vector of two variables, such as the number of previous reviews and the review date of the review in the treatment group; *c.g.* is a vector of the same variables; $\sum^1$ is the (2 * 2) inverse Variance–Covariance matrix of the two variables; and $'$ represents the transpose of a matrix.

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