Exploring the Behavioral Drivers of Review Valence: The Direct and Indirect Effects of Multiple Psychological Distances.

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Abstract

Purpose – While the literature has established the effect of online reviews on customer purchase intentions, the influence of psychological factors on online ratings is overlooked. This paper examines these factors under the perspective of Construal Level Theory (CLT).

Design/methodology/approach – Using review data from TripAdvisor and Booking.com, we study three dimensions of psychological distances (Temporal, Spatial, and Social) and their direct and interaction effects on review valence, using regression analysis. We examine the effect of these distances on the information content of online reviews employing a novel bag-of-words model to assess its concreteness.

Findings – Temporal and spatial distance have positive direct effects on review valence. Social distance, on the other hand, has a negative direct effect. However, its interaction with the other two distances has a positive effect, suggesting that consumers tend to *"zoom-out"* to less concrete things in their ratings.

Practical implications – The findings provide implications for the interpretation of review ratings by the service providers and their information content.

Originality/value – Our study extends the CLT and eWOM literature by jointly exploring the effect of all three psychological distances that are applicable in post-purchase evaluations. Methodologically, it provides a novel application of the bag-of-words model in evaluating the concreteness of online reviews.

Keywords: Construal Level Theory, Review Valence, Online Reviews

1. Introduction

Imagine that you are on holiday having happy times of relaxation with your friends/family or even alone. At the hotel, however, there are some smaller or bigger annoyances. The couple in the next room is a bit noisy, the breakfast is not to your taste, and the swimming pool is not of the dimensions that you believed it would be based on the photos on the hotel's website. After returning home, you receive a message that asks for an evaluation of your experience with the hotel. You can choose to do it right away, but you can also opt to postpone it until a later date. Could the decision of when to write the review affect your evaluation?

The main theoretical underpinning behind the formation of online ratings is that of expectation confirmation (Oliver, 1980) where consumers' *a posteriori* evaluations derive from the deviations of the real experience with their *a priori* expectations. Nevertheless, this process may be regulated by several psychological factors which influence the way ratings are formed and their subsequent textual justification. This is primarily related to the recall mechanisms that consumers use when evaluating an experience. Social psychology suggests that psychological distances (Temporal, Spatial, Social, and Hypothetical) have an effect on the way people think about objects and events (Trope and Liberman, 2010). The closer someone is with the event, he/she *"zooms-in"* into his/her experience, focusing on the more concrete aspects, even on small details (low-level construals). On the other hand, as someone becomes more and more distant, the *"lens"* he/she uses to recall the experience *"zooms out"* to the more abstract aspects (high-level construals). In our example, it is possible that if the review is posted immediately after returning home, focusing more on the small annoying details would result in a lower rating, than if the review is delayed for an amount of time.

Several studies in the literature have examined the effect of psychological distances on consumers mainly on pre-purchase decisions and evaluations (Yan et al., 2016; Zhao and Xie, 2011). On the other hand, few studies such as those of Pizzi et al. (2015) and Huang et al. (2016) explore their effect on post-purchase evaluations. Considering the significant influence that post-purchase evaluations (expressed through online reviews) exercise to sales, it is important to understand if similar dynamics such as that of future decisions affect past experiences. These effects also have implications for the information content of online reviews since lower level construals will result in more concrete reviews which contain more useful information for managers to improve their service offering.

We address these gaps by studying the concurrent effect of three distances (Temporal, Spatial, and Social) in a hospitality setting and how they impact hotel ratings. In doing so, our study complements and extends previous research in the CLT literature by jointly exploring the effect of a third distance (Social distance). Specifically, we answer the following set of questions: (a) *Does the time elapsed between customer experience and the date he/she posts the review has an effect to the rating provided?* (b) *Is the geographical distance between the country of the customer and the destination country a factor that may influence the overall satisfaction?* (c) *If a customer's culture is close to the visiting country and/or the customer knows the local language does it make the experience better?* The importance of examining the concurrent effect of all distances rather in isolation has been pointed in the literature as a way to address reduced sensitivity (Maglio et al., 2013) or asymmetries (Zhang and Wang, 2009). To examine the effect of one distance in isolation without controlling for the others and their interaction is problematic and could lead to wrong conclusions as some dimensions could be considered more primary than others (Bar-Anan et al., 2007).

Our study examines the influence of psychological distances on a rather unexplored context, that of eWOM, and their effects on the formation of online ratings. The closest study

4

in the literature, is the one by Huang et al. (2016) who examine the formation of online ratings in restaurant service encounters. Our study is different in several ways. First, we examine three dimensions instead of two including Social distance. Second, reviews in hotel service encounters, compared to reviews in restaurant service encounters, usually arrive from a more disperse pool of international reviewers creating a bigger variation regarding the Spatial and Social distances. As a result of the different variation of spatial distances, a significant portion of restaurant reviews could come from locals or repeated customers, and therefore reverse causality could be an issue. In our sample, we exclude local visitors diminishing that way such concerns. Finally, the duration of a service encounter in hotels is longer than the service encounter in restaurants which could result in different mental representations (Miao and Mattila, 2013) and therefore the effect of psychological distances may be different.

A parallel contribution of our study is methodological and deals with the measurement of review text concreteness/abstractness using an automated procedure. We introduce a novel bag-of-words approach based on the work of Brysbaert et al. (2014) that offers several advantages compared to standard coding practices used in the literature (e.g., the linguistic categorization model), allowing us to analyze the whole sample of reviews.

To this end, the rest of this paper is organized as follows. Section (2) provides the theoretical background and the hypotheses formulation. In section (3) we present a description of the data used, the operationalization of the variables, and the empirical specification for the analysis. Section (4) provides the results and the hypotheses testing and our study concludes in section (5).

2. Literature Review and Hypotheses

Electronic Word of Mouth (eWOM)

With the emergence of Web 2.0 and the advent of review aggregators, there is a revitalization of the WOM studies mainly exploring online reviews. Online reviews substitute or complement the traditional forms of word of mouth and customer to business communication about product quality (Chevalier and Mayzlin, 2006). A stream of studies in extant literature investigates eWOM and its impact on products or services from several different perspectives, such as their influence on sales, reviewer motives to engage in eWOM or elements that make a review helpful (Brodie et al., 2013; Korfiatis et al., 2012; Zhao et al., 2015).

Specifically in tourism and hospitality, online reviews could help companies to engage customers and lead to greater revenue offering unprecedented opportunities for understanding and responding to customer preferences (Leung et al., 2013). Given the significant influence that online reviews exert on hotel booking intentions (Zhao et al., 2015), and as a complimentary tool to traditional customer satisfaction measures (Kim et al., 2017), we find a proliferation of studies for the specific topic (see for example Kwok et al., 2017 for a systematic analysis on 67 studies with online reviews as their core theme). However, there is a considerable asymmetry on the volume of literature that examines the behavioral determinants of review valence and the influence of psychological factors on online ratings. We address this from the perspective of Construal Level Theory (CLT).

Construal Level Theory and Consumer Evaluations

Extant literature in social psychology postulates that peoples' memories of events are inconsistent with their perception of these events at the time they happen (Wirtz et al., 2003). A theoretical framework that explains those differences, Construal Level Theory (CLT),

argues that as the psychological distance from objects, events, or individuals increases, people tend to use different mental representations (construals) when they recall their experiences with them (Trope and Liberman, 2010).

Four psychological distances and their respective construal levels are established in CLT, namely temporal, spatial, social, and hypothetical distances (Trope and Liberman, 2010). The temporal distance changes people's mental representations of events and consequently mediates temporal changes in the perceived value given. Specifically, people use abstract mental representations (high-level construals) when they are planning or thinking about distant future events compared to more concrete mental representations (low-level construals) when they are thinking about near-distance events. The same dynamics also apply in the case of spatial, social, and hypothetical distances where social distance is defined as the measure of space between two or more social groups or individuals. However, for post-experience evaluations, the hypothetical distance is non-applicable since it applies to the likelihood of an event occurring in the future.

Several studies examine the effect of psychological distances to consumer evaluations and choices. Ding and Keh (2017), by conducting two lab experiments, show in the context of service evaluations and choice that customers when on low-level construals rely more on intangibles while when on high-level construals rely on tangible aspects. Wright et al. (2012) report effects of psychological distance on customers' perceptions about the validity of marketing claims. Customers in low-level construal mindsets have a higher truth rating than customers on high-level construals. Chung and Park (2013) found that both social and temporal distances have an effect on consumers' evaluations of a company with ambivalent behavior in terms of morality or competence. Finally, the results of Zhao and Xie (2011) show that the recommendation of others is more persuasive on distant than the near future. A common characteristic of all these studies is that they examine future decisions and are

performed in a controlled laboratory context. However, evaluating the effect of these distances under realistic marketing mix conditions is challenging as asymmetries in their effect may be materialized (Zhang and Wang, 2009).

Hypotheses development

Although the theoretical background of CLT relates construal levels with future events, Pizzi et al. (2015) extend this understanding by including also past events. In a consumer preference framework, they found that consumers rely on more concrete attributes to represent near-past experiences compared to more abstract attributes that are used for distant-past experiences. They also report an effect of the temporal distance to overall satisfaction as respondents give more (less) weight to high than low-level attributes when the time distance from the experience increases (decreases). Their results support that "*satisfaction judgments shift over time as a result of the different psychological mechanism that are activated as the function of the time elapsing between service experience and its evaluation*" (p.484).

We expect the more distant a reviewer is from the experience, the less negative to be. This is also supported by evidence from clinical psychology. Siedlecka et al. (2015) show that there is a correlation between rumination of negative events and temporal psychological distance. Kross et al. (2012) also explain the mechanism that enables people to reduce anger and negative emotions from negative experiences. They report that a self-distant perspective which is connected with more abstract information enables individuals to focus on their experience without reactivating their aversiveness compared to a self-immersed approach where the mental representation of experiences is more concrete. Spronken et al. (2016) explore if the temporal distance from an event induces more positive thoughts about it and in a lab experiment found evidence to support it. The results from Huang et al. (2016) also point

to this direction, reporting that the temporal and spatial distances are positively associated with the review rating. Considering the above, psychological distances and high-level construals should induce positivity to the overall satisfaction. As such, we expect:

H1: The *temporal distance* between the hotel stay and the time point of review publication has a significant *positive* effect on review valence.

H2: The *spatial distance* between the location of the reviewer and the location of the hotel has a significant *positive* effect on review valence.

Williams et al. (2013) report influences of psychological distances on affect-based evaluation. Specifically, their results show that distance reduces the intensity of experiences, but at the same time, abstract thoughts increase the positivity in both negative and positive experiences improving evaluations. Kim et al. (2008) examine the effect of temporal and social distances on consumer evaluations and found that customers with a greater distance focus more on abstract information. Based on the results of Huang et al. (2016), who report a "*distance boosting effect*" of the temporal and spatial construals on the review rating, we expect high-level construals to be realized with a more positive rating as they are more abstract. Consequently, low-level construals will be realized with a more negative rating due to their concreteness. In that direction, we examine how textual features of online reviews are affected from psychological distances. High-level construals would result in more abstract textual justifications and positive ratings as a by-product of the reasoning we followed on H1 and H2. On the other hand, low-level construals will lead to more concrete textual justifications which will lead to less positive ratings. As such, we consider the following hypothesis:

H3: Review text concreteness has a negative effect on review valence.

For the social distance, we expect the adverse relationship as according to Liberman et al. (2007), in-groups are perceived more positively than outgroups and therefore social

9

distance reduces positivity. Karakayali (2009, p. 538) suggests that when the social distance is high, "*relationships tend to lose their affective content or, worse negative affections dominate the relationship*". Moreover, social closeness and familiarity display a positive and statistically significant correlation (Segal et al., 2003) and familiarity activates affective responses and might provide a sense of security and comfort to customers (Tasci and Knutson, 2004). Even from ancient history it is known the panic the people feel when they cross the boundaries of certainty (Korstanje, 2011). In general, social distance and the specific operationalization in the form of cultural distance will have an influence on customer experience either through their interaction with locals or with employees and other customers. Customers from different cultures have different expectations of service employee behavior (Kong and Jogaratnam, 2007), therefore deviations from the expected behavior derived directly from cultural difference may be perceived as negative. Furthermore, literature denotes the effect of customer to customer interactions (e.g., Nicholls, 2011) to the overall experience and its importance in service environments (Martin and Pranter, 1989). This is more pronounced in hospitality services where the interaction among the customer is for a more prolonged period of time than in other forms of service encounters. In that aspect, cultural differences among customers may lead to tensions because of the different views of what is a socially accepted behavior. Therefore, the cultural distance between a customer's country of origin and the host country is expected to have a negative effect on his/her service evaluation. Thus, we have:

H4: The *social distance* between the reviewer and the host country has a significant *negative* effect on review valence.

3. Data and Methods

Dataset description

We collected online reviews from TripAdvisor for all London-based hotels. Our choice to sample reviews from a specific city is grounded on two reasons. First, we wanted to secure homogeneity in the experience levels for all reviewers. Second, as an alternative proxy for measuring the social distance, we use the knowledge of the local language, and we capture this by the language used in the review text. Reviewers in these platforms usually communicate in English, so the selection of a city where the official language is English is a natural choice. Our dependent variable is the review score, a Likert scale variable that takes values between 1 to 5.

An initial dataset of more than 900,000 reviews from TripAdvisor was collected. After excluding those reviews where the reviewer's location was not disclosed and those from UK-based we have a final sample of $N = 215,034$ reviews. The basis of the exclusion was to ensure the distinction of the effect of social and spatial distances since in the case of UK customers they would equal (*Social D*) to or close to zero (*Spatial D*). In addition, we wanted to avoid reverse causality in the case of spatial distance since locals may choose to stay in a far away hotel because perhaps there are loyal customers. These reviews come from a pool of travelers from approximately 90 countries where US travelers account for ~30% of the total sample. The ratings are provided for a total of 1022 hotels with an average of 210 reviews per hotel. The average time to post a review in our sample is 1.3 months. From the 215,034 reviews, 151,707 are in English, and the average length of a review with English text is 136 words.

Operationalization of Variables

Temporal Distance

Temporal distance (*Temporal D*) captures the time between the service encounter and the time that the review was posted on TripAdvisor. For each review, we computed the temporal distance from a self-reported field where the reviewer declared the month and year of staying and subtracted that from the date of the review publication. Since we do not have information about the exact review date, the distance is measured in elapsed months.

Spatial Distance

Our second explanatory variable, the spatial distance (*Spatial D*), is operationalized as the geographical distance between the self-reported reviewer location and the city of London. From the self-disclosed location of the reviewer, we compute the longitude and latitude, and derive the geographical distance from central London by applying the shortest distance between those two pairs of latitude and longitude with the Haversine method. We used a comprehensive named entity recognition procedure (NER) to identify the location coordinates of the reviewer (e.g., *Boulder, Colorado*) using Google's map API.

Social Distance

A key idea that facilitates our study is that a form of social distance is the interpersonal similarity and that people perceived similar others as socially closer (Liviatan et al., 2008). Consequently, as the cultural similarity is a form of interpersonal similarity with others, we used the Hofstede (2010) cultural dimensions to measure the social distance of the reviewer with the country he/she visits. As a proxy for the social distance (*Social D*), we computed the cultural similarity between the country of the reviewer's location and the U.K. This operationalization of the social distance was calculated by using the Kogut and Singh (1988) formula:

$$Distance_{ju} = \frac{1}{4} \sum_{n=1}^{4} \frac{(D_{ji} - D_{ui})^2}{V_i}$$

Where D_{ji} is the *i-th* dimension for country *j*, D_{ui} is the value of this dimension for the U. K., and V_i denotes the variance of that specific dimension. We used only four out of the six main Hofstede dimensions (Power Distance, Uncertainty Avoidance, Masculinity, and Individualism) to compute the distance measure, since for several countries in our sample there are no values for the other two (Long term orientation and Indulgence). Hofstede (2010) measures core social values across different nationalities such as if people accept and expect inequalities and are respectful or obedient to hierarchy (Power Distance), if the collective interest is more important than individual interest (Individualism), the degree of tolerance of people towards uncertainty and ambiguity (Uncertainty Avoidance), or the degree of emotional role differences among the two genders and how society perceives *"tough"* and *"soft"* values (Masculinity).

Ghemawat (2001) discusses the concept of distance and the different forms that should be taken into consideration before expanding in a foreign market. The author considers the cultural distance not only as a factor of social norms but also in terms of religious beliefs, race, and language differences. While social norms are many times invisible, other cultural attributes such as the language are more easily identifiable. Having that in mind as an alternative proxy for the operationalization of the social distance, we use the source language of the review text. Reviewers that have the ability (and confidence) to express their evaluation in English (and therefore we assume that are more fluent and have more interactions with the locals during their stay) should feel less socially distant in London compared to the reviewers that do not have the same ability. We recognize that even in the group of the reviewers that choose to write a review in a different language could be English-Fluent speakers, but on average the two groups should have a significant difference.

Therefore, as an alternative specification we employ a dummy variable that captures the language of the review text (Language) and takes the value *"0"* if the text is in English and *"1"* otherwise. Our operationalization of social distance is in line with the extant literature. Karakayali (2009) summarizes social distance into four distinct conceptions, namely Affective, Normative, Interactive, and Cultural and Habitual distances. While culture pertains to the cultural and habitual distance which refers to the cultural similarity between two groups, language pertains to the interactive social distance which focuses on the frequency of the interaction between groups. Apparently, a common language is the tool that will facilitate the interaction between groups and individuals.

Control Variables

For robustness, we control for hotel average review score , monthly dummies to capture seasonality, dummies for customer types (Business, family, couple, solo, group) and the reviewer's level of contribution which captures a snapshot of the reviewers' involvement in providing reviews on TripAdvisor.

4. Results

The effect of psychological distances on review valence

We are interested in examining the effect of Temporal, Spatial, and Social distances in review score but we also aim to evaluate the effect of the interaction among these variables. Therefore, our main model includes the interaction among the pairs of distances and a triple interaction of all distances. Considering the nature of our dependent variable, we employ an Ordinal Logistic regression. For each particular review i on our dataset, our econometric specification has the following form:

$$ReviewScore_i = \beta_1 TemporalD + \beta_2 SpatialD + \beta_3 SocialD + \tag{1}$$

$$\gamma_1 (TemporalD \times SpatialD) + \gamma_2 (TemporalD \times SocialD) +$$

$$\gamma_3 (SpatialD \times SocialD) + \gamma_4 (TemporalD \times SpatialD \times SocialD) + \delta_1 \, Hotel \, Average +$$

$$\delta_2 Reviewer \, Experience \; + \sum_{l=1}^{11} \delta_3^l Month \; + \sum_{k=1}^{4} \delta_4^k \, Customer \, Type$$

Where β corresponds to the direct effects of the distances, γ reflects interaction effects and δ the coefficients of the control variables, respectively. Our estimation procedure considers two pairs of models to be estimated using a Maximum Likelihood estimator. The first pair of our models considers *Social D* operationalized by the cultural distance and the other pair operationalizes *Social D* using the language. In each pair, the first model considers a regression of the dependent variable with the three distances and the control variables, while in the second model we also include the interaction effects. Results are reported in Table 1 and reveal that all three distances (*Temporal D*, *Spatial D*, *Social D*) have a significant and direct effect on review valence.

When all interaction effects are considered, Temporal distance has a positive effect on the review score ($\beta_1=0.037$, $p<0.001$) confirming Hypothesis 1. The effect of Spatial distance ($\beta_2=0.021$, $p<0.001$) is also significant, confirming Hypothesis 2. The effect of Social distance, either expressed through the cultural distance index ($\beta_3=-0.013$, $p<0.001$) or through the language of the review text ($\beta_3=-0.022$, $p<0.001$), has the expected negative relationship with the review score, thus confirming Hypothesis 4.

The interactions of Social D with the other distances are reported significant and positive, and this result provides further validity to the expectations derived from Construal Level Theory and reveals a distance boosting effect ($\gamma_2=0.021$, $p<0.001$; $\gamma_3=0.024$, $p<0.001$) on review valence.

Review text concreteness and review valence

To evaluate Hypothesis 3, we followed a novel approach utilizing the dictionary of Brysbaert et al. (2014) in a bag-of-words model to score the concreteness of the review text. The scoring dictionary contains a set of 40,000 lemmas and their corresponding concreteness value and is primarily based on the SUBTLEX – US word frequency list (Brysbaert and New, 2009) and supplemented with additional words such as those found in shop catalogs. Due to its coding nature (with the concreteness rating sourced from human coders), this dictionary represents an ideal base for our text scoring task. The advantage of using this approach over a set of trained human coders using other approaches, such as the Linguistic Categorization Model (e.g., De Angelis et al., 2017), is the coverage of the sample and the efficiency of the human coders involved. In our analysis instead, we were able to estimate a concrete/abstract score for the total sample of reviews written in the English language using an automated procedure.

We used a language identification procedure on the review text to extract only those reviews written in English *(N=151,714)*. From each review, we removed the punctuation marks and transformed the case of each word in order to match it with the lemmas in the concreteness dictionary. Considering a review r_i with its textual justification, we consider the resulting set of n unigrams (single words) after all pre-processing in this review text as:

$$r_i = \{u_{i1}, \dots, u_{in}\}, \forall\, n > 0$$

Since the dictionary we used contains all word forms, no stemming was needed. For the textual content of each review, we calculated the total number of words that match a lemma in the concreteness dictionary and the total score resulting from the sum of each concreteness rating for this particular word as follows:

16

Let C be the universe of all the tuples in our scoring dictionary such as $C^n = \left((c^1, v^1), ..., (c^k, v^k) \right)$ where v is the corresponding concreteness score. We match the unigrams of our review text with the set of unigrams that correspond to the concreteness values and then sum this result and weight it with the length of the unigrams in this review text as follows:

$$AvgConcreteness = \frac{1}{n} \sum_{1}^{k} \left(v_k \in r_i \bigcap C \right)$$

The number of lemmas found in the dictionary, comprised an average 89% of the total words for a particular review, a very high portion of the review text supplied. An example is provided in Table 2 as well as two examples of highly concrete and abstract review text for a given length.

*******INSERT TABLE 2 AROUND HERE*******

Having computed the mean concrete score of the text, we measured the relationship between review valence and concreteness using all of the previously mentioned control variables. Additionally, we also controlled for review length (ReviewLength).

Consequently, our econometric specification has the following form:

$$ReviewScore = \beta_1 ConcreteScore + \beta_2 ReviewLength + \delta_1 \, Hotel \, Average \qquad (2)$$

$$+ \, \delta_2 Reviewer \, Experience \, + \sum_{l=1}^{11} \delta_3^l Month$$

$$+ \sum_{k=1}^{4} \delta_4^k \, Customer \, Type$$

To ensure robustness, we run additional estimations by imposing arbitrary cutoffs on the minimum length of the review text (Nwords = 50 and Nwords = 100) and estimating the

model separately. Results are reported in Table 3 and confirm the negative relationship between review score and concreteness *(β=-0.560, p<0.001; β=-0.586, p<0.001; β=-0.485, p<0.001)* for all the thresholds of the minimum review length. Therefore, Hypothesis 3 is confirmed.

*******INSERT TABLE 3 AROUND HERE*******

Mediation Analysis

Building on Hypothesis 3, we wanted to evaluate whether concreteness mediates the distance boosting effect of the psychological distances on the formation of review valence. To evaluate this, we used the four-step Baron and Kenny procedure (Baron and Kenny, 1986) to test whether the direct effect of each of the psychological distances on review valence becomes weaker for concrete reviews.

*******INSERT TABLE 4 AROUND HERE*******

Table 4 reports the bias-corrected indirect effects on review valence for the mediation estimation. A bias-corrected bootstrapping procedure with n=10.000 iterations was used to obtain confidence intervals (Hayes, 2013). Standardized indirect effects were computed for each of 10,000 bootstrapped samples, and the 95% confidence interval was calculated by determining the total effects at the 2.5th and 97.5th percentiles. The bootstrapped standardized indirect effect for Time D *(β=0.001, p<0.05)* and Spatial D *(β=0.001, p<0.001)* were positive and significant, and the 95% confidence interval ranged from [0.001, 0.002]. We found a significant negative indirect effect for Social D *(β =-0.003, p<0.001)* with a 95% confidence interval for Spatial D between [-0.004, -0.002]. All confidence intervals didn't include zero. The results confirm that the indirect effect of the psychological distances on review valence is mediated through the effect they have on review text concreteness.

How concreteness affects review text polarity?

For the stability of our results, we performed a second study with a different dataset collected from Booking.com. This dataset containing $N_{booking}$ =252,874 reviews allows us to use the same type of controls (with the exception of reviewer experience) but it has two distinct advantages over the TripAdvisor dataset. First, the response variable is measured on a continuous rating scale (0 to 10) allowing for more variation. Second, when a customer provides a review, he/she writes his/her positive and negative points in two different text boxes. In that way, the impact of review text concreteness between positive and negative reviews can be compared. This provides further support for Hypothesis 3.

*******INSERT TABLE 5 AROUND HERE*******

As can be seen in Table 5, we ran three different estimations on the new dataset. For all models, concreteness is highly significant for the positive part (β=-0.034, p<0.001) and with a higher and significant coefficient for the negative part (β=-0.344, p<0.001) of the review text. When both parts are taken together, the effect of concreteness is significant and in the same direction *(β=-0.055, p<0.001; β=-0.202, p<0.001)* as in the estimations provided in Table 4. The outcomes of the third model where we evaluated the concreteness of the positive and negative text simultaneously reveal that for the review score, the concreteness depicted in the negative text has a higher effect. The results of this analysis further confirm Hypothesis 3 suggesting that concrete textual justifications are normally associated more with the negative than the positive part of the review comments.

5. Discussion and Conclusions

Conclusions

Our results reveal that psychological distances and their interactions influence customer evaluations. This effect appears both in review rating but is also expressed in the review text. We highlight the implications for theory and practice oi the sections that follow.

Theoretical Implications

This study adds to the eWOM literature by exploring the effect of psychological distances sourced from the CLT literature by evaluating for the first time the joint effect of three distances (Temporal, Spatial, and Social). We also contribute to the CLT literature by studying past experiences and not future decisions. While we confirm the positive effect of temporal and spatial distances as in Huang et al. (2016) and Pizzi et al. (2015), we assess the direct effect for the social distance simultaneously and we find a negative relationship. By jointly estimating the effect of all three distances, we add to the stream of the CLT literature that discusses psychological distance sensitivities and asymmetries (Maglio et al., 2013; Zhang and Wang, 2009). More specifically, not only did we find that the direct effects are significant in the presence of all three dimensions, but we also report a *"distance boosting effect"* of the social distance with each of the other two distances.

We also considered the indirect effect of the psychological distance on review valence by evaluating the impact of high and low-level construals on review text concreteness. In doing so, our study has a methodological contribution introducing a bag-of-words approach to measure concreteness based on the dictionary provided by Brysbaert et al. (2014).

Practical Implications

Our results provide significant managerial implications for the interpretation of review ratings by managers. Established service quality measurement frameworks such as ServQual (Parasuraman et al., 1988) consider customer feedback as a measure which is independent of time. Our results highlight that the time elapsed between the service encounter and customer feedback, is a significant parameter to consider when evaluating the input of customer reviews in service improvement initiatives. The effect of Spatial and Social distances also adds an additional level of their interpretation considering that the service encounter framework that we have considered is highly heterogeneous regarding customers' cultural backgrounds.

Our findings have implications for managers regarding the time needed to approach the customers for surveys or to post their reviews. Given the effect of online reviews on hotel room bookings, granting some time before asking customers to rate their experience, should result in a higher rating. On the other hand, managers that use online reviews to improve their hotel's service offering and therefore more concrete information is required, should target to elicit customer feedback as soon as possible. Our findings have implications also for platform intermediaries and customers. An indirect result is that customers with cultural closeness with the hotel will be more positive in their evaluation and thus international customers may get influenced by positive reviews from people with different cultural norms. However, reviews from customers that are culturally close are more representative of what to expect for a customer belonging to the same cultural group.

The results related to the effect of psychological distances on review text concreteness provide additional insights to the direction of review helpfulness. Prior literature reports that customers perceive as more helpful those reviews that are more concrete than abstract (Li et

al., 2013). Considering this, online travel intermediaries should promote more reviews from customers where the temporal distance is lower. This is more applicable in the case of hotels that already have a large volume of reviews available for consumers. Viglia et al. (2016) find that a large review volume tends to have decreasing returns on hotel occupancy rates. Using the temporal distance as an interface filtering cue, online travel intermediaries can address this issue and increase the conversion rates of their offerings.

Having in mind that overall customer satisfaction may be regulated by cultural distance, hotel managers can be more proactive to communicate to customers possible "*cultural shocks*" or codes of conduct within or outside the hotel. This could take several different forms such as information packages at check-in. This information will allow guests to get more adjusted and less "*surprised*" to the culture of the visiting country. Similar information should also be communicated online. Proper signaling in some areas of the hotel (e.g., for proper conduct in shared areas) should inform visitors about acceptable behaviors. An area of improvement could be the training of employees to cross-cultural understanding. Some cultures are more *"silent"* and more reluctant to complain in a foreign country (Sparks, 2001)**.** Consequently, personnel should be able to understand how some cultures react and try to elicit information from guests about possible issues and subsequently apply service recovery strategies to increase customer satisfaction. Service recovery strategies such as apology, correction, explanation, compensation etc. have been found that increase positive word of mouth but this requires that the hotel management identifies the problem and proceeds with corrective actions (Lewis and McCann, 2004)

Limitations and Future Research

Our study has several limitations which derive mainly from the nature of online reviews. Online reviews are known to exhibit specific biases, such as self-selection bias (Li

and Hitt, 2008) or response biases (Hu et al., 2009), and in some cases can be a subject of manipulation (Mayzlin et al., 2014). However, even in the presence of such biases, given the effect of online reviews on sales, it is important to understand the behavioral determinants of review characteristics. Nonetheless, primary data offers the ability to elicit and control for customers' personal characteristics, which are not available in online reviews. This has implications for the computation of cultural distance as other measures could be used there as well (i.e. religion) or the participants could be directly asked how socially close they feel in their experiences.

In addition, the computation of the social distance using the hotel customers' self-declared country-of-origin may not always be a true proxy of the social distance as it may not capture the specific cultural background (e.g., expats). Also, Hofstede dimensions are aggregate measures and measuring through individual responses could be more representative. However, we address this using language as a second cultural proxy with similar results. Nevertheless, our operationalization of the social distance is through the lens of ingroup vs. outgroup distance and not self vs. others. In the former form, all reviews should be considered socially close, as they reflect the reviewer's personal experiences.

Ghemawat (2001) also argues that the geographical distance should not be considered as a matter of distance *per se* but in conjunction with other characteristics, such as the physical size of the country.

Several avenues for future research can be initiated regarding other features of online reviews that are also important such as review helpfulness. Recent studies have shown that linguistic features of the review affect the perceived helpfulness of a particular review (Mertz et al., 2014; Singh et al., 2017) . However, as we show in our study with the effect of temporal, spatial, and social distance, consumer characteristics may also be taken into account considering the cultural differences between those who write the review and those

that assert its helpfulness. The study by Zhao and Xie (2011) about the influences of the social distance to consumers' responses to peer recommendations support such a hypothesis.

Also, it will be interesting to see the moderating role of emotions and their effect to the perceived distance and consequently the abstractness of the text. The effect of some distances can also be regulated by the adoption and use of technology. With the use of communication services, people can feel at the same time "*home*" and "*away*" (White and White, 2007) if they are in contact with friends and family. Therefore, a possible direction could be to study the moderating role of communication with family and friends to the effect of geographical and social distances.

Future research could measure the effect of a negative experience to the time to post and if there are differences with positive or neutral experiences. Although hypothetical distance is not valid on post-purchase experiences, studying service evaluations and choices under the influence of all four distances is an intriguing subject for study in pre-purchase settings. In addition, we expect differences in the perception of geographical and social distances based on demographics. For example, Millennials or Generation Z which are more exposed to new technologies and social media could be perceived culturally closer to the same generation people from other countries compared to baby-boomers or Generation X. Historical connections or trade flows among countries could also moderate the effect of geographical and/or social distances (Ghemawat, 2001). Finally, our results consider the context of services and not of products. In products, these dynamics may have different directions as it is an ongoing process and the temporal distance between purchase and review posting may reveal failures that occurred during a product's usage life-cycle.

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Table 1: Ordinal logistic regression results for the effect of psychological distances on the review score (DV)

	Direct Effects		Interaction Effects	
Temporal D	0.037***	0.038***	0.037***	0.028***
	(0.004)	(0.004)	(0.004)	(0.005)
Spatial D	0.016***	0.019***	0.021***	0.014**
	(0.004)	(0.004)	(0.005)	(0.005)
Social D (Hofstede proxy)	-0.015***		-0.013***	
	(0.004)		(0.005)	
Social D (Language proxy)		-0.027**		-0.022***
		(0.010)		(0.010)
Temporal D × Spatial D			-0.008	-0.007
			(0.005)	(0.006)
Temporal D × Social D			0.021***	0.020*
			(0.004)	(0.009)
Spatial D × Social D			0.024***	0.022*
			(0.005)	(0.010)
Temporal D × Spatial D × Social D			0.002	-0.016
			(0.005)	(0.009)
Hotel Average Rating	1.924***	1.922***	1.923***	1.921***
	(0.008)	(0.008)	(0.008)	(0.008)
Reviewer's Level of Contribution	-0.079***	-0.079***	-0.080***	-0.079***
	(0.002)	(0.002)	(0.002)	(0.002)
Monthly Dummies	YES	YES	YES	YES
Customer Type Dummies	YES	YES	YES	YES
McFaden's R^2	0.126	0.126	0.126	0.126
AIC	507979	507658	507940	507953
Observations	215,034	215,034	215,034	215,034

*Note: *p<0.05; **p<0.01; ***p<0.001,*

Table 2: Example concreteness scoring for a review in our sample (TripAdvisor Dataset) as well examples of reviews with low and high concreteness ratings.

Example review: "Neat!" (4 out 5 stars) Reviewed 15 October 2011
Good location. Nice price if you book well in advance. Staff is helpful. Room pretty, small though.

Lemma	Score
good	1.64
location	3
nice	2.18
price	3.63
if	1.19
you	4.11
book	4.9
well	3.33
in	3
advance	2.57
staff	4.36
is	1.59
helpful	1.76
room	4.79
pretty	2.4
small	3.22
though	1.2
Average Score	**2.874**
Low Concreteness Example (1.90):	"Great Experience" 5/5 Reviewed 7 July 2012. *The location is great and nothing is too much trouble for the staff. Overall, had a great stay and would stay again.*
High Concreteness Example (3.03):	"If you need to be in the area - good choice" 5/5 Reviewed 5 July 2013 Old building - needs a bit of refurbishment Rooms facing the road are noisy from heavy traffic Bathroom on my room had paint peeling off the ceiling Breakfast is ok, basic, but filling. Staff very helpful.

Notes: Individual lemma scores obtained from the list of Brysbaert et al. (2014). The average score has been computed based on the sum of each lemma's individual score over the total number of lemmas that were found to be contained in the review text.

Table 3: Ordinal logistic regression results for the effect of review content concreteness on review score (DV)

	(1) (All reviews)	(2) (Review Length >50)	(3) (Review Length >100)
Concreteness	-0.560***	-0.586***	-0.485***
	(0.036)	(0.045)	(0.066)
Review Length	-0.002***	-0.002***	-0.001***
	(0.000)	(0.000)	(0.000)
Hotel Average Rating	1.952***	1.948***	1.898***
	(0.010)	(0.011)	(0.014)
Reviewer's Level of Contribution	-0.077***	-0.069***	-0.043***
	(0.003)	(0.003)	(0.004)
Monthly Dummies	YES	YES	YES
Customer Type Dummies	YES	YES	YES
R^2	0.121	0.121	0.115
AIC	350003	294032.9	187495.8
Observations	151,707	125,137	76,747

*Note: *p<0.05; **p<0.01; ***p<0.001.*

Table 4: Bias Corrected unstandardized indirect effects of the psychological distances on review valence (DV) using review text concreteness as a mediator.

	Estimate	Z-score	Bootstrap CI (95%)
Temporal D	0.001*	2.043*	[0.001,0.002]
	(0.000)		
Spatial D	0.001***	3.044***	[0.001,0.002]
	(0.000)		
Social D	-0.003***	-9.822***	[-0.004, -0.002]
	(0.000)		

Note: Social D has been computed using the cultural distance as a proxy since we use only the reviews that contain English text (N=151,707). Number of bootstrap samples for bias corrected bootstrap confidence intervals is 10.000, *p<0.05; **p<0.01; ***p<0.001.

Table 5: Linear regression results for the effect of concreteness on review score for positive, negative and all part of the review text from the Booking.com dataset.

	(1) (Positive Text)	(2) (Negative Text)	(3) (All)
Concreteness (Positive)	-0.034***		-0.055**
	(0.008)		(0.008)
Review Length (Positive Text)	0.014***		0.018***
	(0.0001)		(0.0001)
Concreteness (Negative Text)		-0.344***	-0.202***
		(0.008)	(0.008)
Review Length (Negative Text)		-0.012***	-0.016***
		(0.0001)	(0.0001)
Hotel Average Rating	0.863***	0.872***	0.808***
	(0.003)	(0.011)	(0.003)
Monthly Dummies	YES	YES	YES
Customer Type Dummies	YES	YES	YES
R^2	0.264	0.271	0.334
Observations	252,874	252,874	252,874

Note: *p<0.05; **p<0.01; ***p<0.001