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## Online Evaluators: Ethics of Conviction versus Ethics of Responsibility in Building Evaluations

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## Abstract

Purpose - In this study, we seek to understand which types of evaluators build their evaluations based on the ethics of conviction and which ones build them based on the ethics of responsibility. Theoretical framework - The concepts of the public sphere from Habermas (1991) and ethics of conviction and ethics of responsibility from Weber (1978; 2004) are used to understand the public responsibility of online evaluations by the types of evaluators who produce them (whether real or false). Design/methodology/approach – A cluster analysis with 6,344 evaluations identified four groups of evaluators (speculators, pseudo experts, amateur critics, and real experts). A Spearman correlation matrix is used to verify the correlation between some variables and these groups. Using the quantitative text analysis technique, bigrams (word associations) were identified. Findings -(i) Speculators and pseudo experts tend to present only one score, exercising the act of evaluating using clear ethics of conviction; and (ii) amateurs critics and real experts associate responsibility and experience in the dynamics of translating the gastronomic experience, emphasizing the ethics of responsibility. Practical & social implications of research – As the study by Cruz et al. (2021) presented the types of online evaluators, we characterized them by understanding (i) whether they act based on the ethics of conviction or ethics of responsibility and (ii) the form and content of fake online reviews. Originality/value - We discuss the public responsibility of online reviews - particularly of people who acted as diners.

Keywords: Types of online evaluators, ethics of conviction, ethics of responsibility.

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## 1 Introduction

The discussion on fake online reviews is herein guided by two theories addressed in social sciences: (i) Weber's social action types and (ii) the Habermasian logic of the public sphere. If Weber's (1978, 2004) social action types address the motivations capable of guiding an individual (herein expressed in the writing and publication of online reviews), we can analyze the act of reviewing based on the ethics of conviction or the ethics of responsibility. Yet, based on the logic of the public sphere (Habermas, 1991), a review available on a digital platform becomes public; moreover, it can involve the forms of Weberian rationality (rationality in terms of ends, rationality in terms of values, affective rationality, or traditional rationality).

Reviews encompass ethical processes regarding their social action. They are not a monolithic action, or an isolated action, but produce public effects due to their embodiment by other agents who react to the act – thus, reviews involve a political action element. Based on the conception of ethics of conviction and ethics of responsibility by Max Weber (1978, 2004), we can state that the ethics of conviction weigh on the agent's orientation through their moralities and views of the world (Turner et al., 2012), whereas the ethics of responsibility are a sort of consequence that unites the causalities of the referred action (Colliot-Thélène, 2014). Therefore, overall, a review comprises moral and causality elements in terms of its production and effects.

The magnitude of the topic herein presented can be understood from different perspectives. If we take into consideration fake news production in different fields (in politics or in health, for instance), we can observe how narratives spread by individuals can have an impact on several decisions made by a subject - whether related to consumption or to the exercise of citizenship. In gastronomy, for example, the increased number of restaurant reviews on different platforms (such as Tripadvisor, ifood, or Uber Eats) observed in the last few years highlights the relevance of better understanding fake online reviews, and how they can affect gastronomic understandings and decisions made about micro and macro environments. The content of reviews has an impact on decisions; they (re)structure internal actions or point out the need for changes of small-, medium-, or big-sized players who act in the food and beverage sectors. Thus, online reviews are a reality for these sectors and they influence behaviors, strategies, and decisions.

Studies regarding the online review topic still do not address fake online reviews based on the features of the appraiser's profile and on its association with public responsibility – see the studies by Lappas et al. (2016), Wang et al. (2015), Luca and Zervas (2016), Malbon (2013), and Hunt (2015), who discussed this topic in light of the algorithmization, robotization, and competitiveness process. Accordingly, problematizing the social action types and the Habermasian logic, based on appraiser types, is a contribution focused on the actions taken by groups that present similar features in the production of fake online reviews, rather than the impact of these fake online reviews on certain stakeholders or economic sectors.

Cruz et al. (2021) presented four types of online restaurant appraisers, namely: real expert, amateur critic, pseudo expert, and speculator; the last two types are the ones that produce fake online reviews. Although the aforementioned study highlighted particularities related to the notable presence of television in Brazil, it did not provide evidence related to behavioral features of these appraisers, based on the produced comments, nor a discussion on the public responsibility of reviews themselves. This perspective can be problematized, including when it comes to the impact of fake online reviews on businesses – mainly on gastronomy – and the algorithmization of reviews on digital platforms (Monty, 2021), as well as competitiveness in this sector.

Unlike in the study by Cruz et al. (2021), who only identified the appraiser types, the research gap covered in this study involved the following research problem: is there public responsibility in the parameters applied to reviews by speculators and pseudo experts, when they are compared to amateur critics and real experts? In other words, we aim to reveal the appraiser types that substantiate reviews based on the ethics of conviction, and which of these types are based on ethics of responsibility.

This research gap is mitigated by contributions from the present study, since, based on empirical research supported by the theoretical references assessed, it shows that: i) by measuring the amount of observations, we confirmed the permanence of the appraiser types listed by Cruz et al. (2021); ii) speculators and pseudo experts tend not to adopt content writing in their reviews, but are limited to scoring based on the number of stars; iii) based on Weber (1978, 2004) and Habermas (1991), we find that speculators and pseudo experts act according to



the ethics of conviction, whereas amateur critics and real experts act based on the ethics of responsibility.

## 2 Online reviews and their impacts

As digital platforms give voice to different people and contents that, in the past, were exclusive to limited groups, as well as shining light on these people, they end up leading to anonymity (Abidin et al., 2015). If, in the past, gastronomic reviews were produced by journalists trained to build such critiques (Monty, 2021), everybody can give online restaurant reviews in the redactional society (Hartley, 2000) – including reviewing without even having had the experience. Some studies have deepened the topic of fake online reviews, such as those by Wu et al. (2020), Martinez-Torres and Toral (2019), and Luca and Zervas (2016); yet, there is a knowledge gap regarding the profile and behavior of individuals who act as diners.

Online reviews gather consumers' real experiences and play a part in the social influence previous reviews had on these same consumers (Li et al., 2019). Reviews can be functional or emotional; functional ones are based on service efficiency (Parikh et al., 2017) and the emotional reviews express in words feelings towards experiences (Standing et al., 2016).

If we take into consideration consumers as "review agents" based on a functional-emotional duality, the gastronomic experience issue acquires a new meaning as these agents weigh up their critiques by compensating one or the other side of that duality – therefore, those who do not have gastronomic experience are guided by a "first hand" experience that lacks comparison parameters other than the very moment of that experience; thus, this produces a single picture. According to Aureliano-Silva et al. (2021), online reviews with a high emotional degree and appeal lead to higher potential intentions to visit a restaurant; on the other hand, customers presenting lower involvement with restaurants suffer a stronger impact from emotional comments than from technical ones.

Online reviews have been having an impact on opinions and preferences, as well as on intentions to use a given service (Moro & Esmerado, 2020). Therefore, they have been the object of restaurants' strategies when it comes to their organizational design and services (Mariani et al., 2019) given the hostile competitive environments sometimes observed. As highlighted by Zhang et al. (2010), saturated high competitiveness contexts make managers think of online alternatives as a business path. People can use online reviews to form opinionated involvement before consuming a particular service (Aureliano-Silva et al., 2021; Zhang et al., 2010), although this does not mean that there is a positive causal correlation between a set of available online reviews and its direct impact on potential visits (Lu & Chi, 2018).

Reviews about services and experiences provided by a restaurant are common practices; in a way, they are part of good-governance actions. Alkin et al. (2021) state that review theories have a prescriptive profile, since they guide practices, but not necessarily explanations about a given phenomenon. They point out a review framework in compliance with their work and take into consideration the learning-centered review, according to which reviews work as mechanisms of processes that contribute to decision-making and action-taking. In other words, an accountable review requires knowledge not just about what has been evaluated, but awareness of the evaluated parameters – to a certain extent, this becomes a continuous learning process, either for the appraiser or for the reviewed party.

Reviewing a company on a digital platform is a social action that takes place through mediation between private perceptions and the appraiser's public perceptions (that do not necessarily come from concrete experiences). A review has a social impact and triggers reactions (Turner et al., 2012) that can be positive or negative for potential customers who seek other reviews before making a decision about having an experience or for businessmen who can change the demand for products or services. Accordingly, a review is a social action that has a public impact; therefore, we understand reviews as public acts involving political elements that disseminate positions.

According to Rahman (2009), a review is a complex process that cannot be summarized by the concrete experience of an individual with the dynamics of a given service. Gastronomic experiences involve image, space, and environmental elements capable of having an impact on perceptions and reviews. A restaurant's survival relies on the organization's competence in providing an experience that is in compliance with the originally conceived proposition offered to the customer (Kalnins & Mayer, 2004).

As highlighted by Guo et al. (2020), personal factors and environmental stimuli have a positive influence on consumers' intentions to participate. The very basis of a restaurant review, according to Kim and Tanford (2019b), implies some variables, namely: 1) delimitation



(if it is negative or positive – related to the review and choice); 2) effort (short or long distance – associated with the will to displace); and 3) involvement (casual or special occasion – which has an impact on the will to spend resources). Competition is imminent and considerable bearing in mind that the basic strategies are similar and that there is the need for constant reinvention – based on this particular point, a comprehensive overview of customers' reactions can lead to insights about strategies (Rahman, 2009).

Therefore, it is clear that online reviews can be taken into consideration as managerial tools based on five factors. First, they are the result of a prospective process based on an assessment about the' development and quality of services. Second, tools adopted to design corrective and potential propositions allow for (re) adjustment processes concerning the services provided, based on the diagnosis/analysis of the review's feasibility and pertinence, as well as aiming to enhance elements that are perceived as positive. Third, bearing in mind the diagnostics and designs supported by propositions, it is necessary to allow critical decision-making as a result of feasible and pertinent comments. Fourth, these tools are the methodological part of implementation monitoring. Fifth, they are a feedback tool for the implementation of propositions- in this case, a review cycle is allowed based on online reviews.

The act of reviewing is not exempt and it can also have political and public motivations (Habermas, 1991; Linhares & Popolim, 2016; Monty, 2021). Cruz et al. (2021) presented four types of online restaurant appraisers, namely: real expert, amateur critic, pseudo expert, and speculator; these two last do not have a real consumption experience, but act as diners by producing fake online reviews. Although their study highlighted particularities related to the notable presence of television in Brazil, it did not show evidence associated with the behavioral features of these appraisers based on an analysis substantiated by the comments produced, or a discussion about the public responsibility of the review itself. Table 1 summarizes the appraiser types described by the aforementioned authors.

This is significant, since opinion formation is an imminent process and the construction of a review text can have an impact on the use of certain services. The logic of avoiding risks is part of the experience/online review association, since a well-reviewed restaurant tends to make efforts to provide an experience; in other words, there is the applied effort association (Kim & Tanford, 2019a). These dynamics were assessed by Aureliano-Silva et al. (2021), who argued that there is moderate appeal from the effects of online reviews on the obtainment of a potential visit to a restaurant. We can take into account, at this moment, reviews as a two-way road for both restaurant managers and customers. When it comes to restaurant managers, they allow for consideration and weighing-up about the provision of a particular service. With respect to customers, they allow for the assessment of general and specific parameters applied to a given service, based on qualitative features.

Nevertheless, reviews alone should not be taken as a strategic solution to substantiate decision-making. Coryn et al. (2011) understand that some review perspectives can imply the logic of parameters and replication; or, nowadays, the algorithmization of reviews (Monty, 2021). On the other hand, these authors state that such reviews can add ideological biases that end up guiding the prescriptive, or potentially explanatory, ability, mainly when the reviews are only free and lack guidelines, rather than pointing out how and when to review. This factor does not mean that the parametrization and replicability of reviews ensure protection against ideological bias, but that these dynamics can reduce the impact of these elements on reviews.

Kim and Park (2017) highlight that the larger the number of online reviews, the better a restaurant's performance, mainly because of the social influences encompassed in the set of online reviews available for customers, and because the more up-to-date they are, the wider their reach and impact. Accordingly, Li et al. (2019) point out the need to encourage consumers to post online reviews right after their experience, as well as delimiting their text within this temporal framework. This is so, because the longer the distance, the higher the trend to favor pure emotional bases associated with the memory of the experience; at this point, there is little space for functional critiques.

## 3 Ethics of responsibility and public responsibility of reviews

The act of reviewing consists of listing parameters and criteria that allow for taking context causality into account; moreover, the results of a given action are capable of producing a review at a given moment in time, in comparison to the proposed aims – this action is considered by the reviewed party, since it allows for

| Туре           | Features   |
|----------------|--|
| Real Expert    | This is an appraiser who has previous experience of reviewing on a platform and who also has a real experience as a diner.   |
| Amateur Critic | This is an appraiser who does not often write reviews on platforms, but who had a real experience as a diner and described it.   |
| Pseudo Expert  | This is an appraiser who acts as a diner at the time of writing a review, but who did not have a real experience.<br>However, it is someone who has previous experience on the platform writing several reviews. As they can get some<br>sort of benefit from the platform, because they are quite committed, they end up reviewing in order to increase the<br>number of reviews and the possibilities to profit from these benefits. |
| Speculator     | This is an appraiser who acts as a diner at the time of writing a review, but who did not have a real experience. In addition, they seem to only evaluate in order to feel part of a movement (group behavior), because they also have previous experience in reviewing on that platform.  |

# Table 1Types of Online Restaurant Appraisers

Note. Source: elaborated based on Cruz et al. (2021).

weighing up hits and misses in order to focus on the improvement of its actions (Vedung, 2006). This means that reviewing implies a social action that has a public impact by acknowledging somebody else's action. Thus, a review is a social act that has a public impact – mostly when it is available on free-access digital platforms.

Based on the Weberian logic to explain the description of the main elements of phenomena – in this case, the rationality of the social act that involves the public review of somebody else's action – it is worth setting out a position towards the social act understood by Max Weber. All actions taken by an individual involve a built meaning based on the context of a set relationship, as this same context gives the meaning provided by the agent of the action itself (Weber, 1978); therefore, the social action is a two-way road. Thus, understanding the causal nexus resulting from the social action of the public review of somebody else's action helps in understanding the fact that the action has social impacts and triggers reactions (Turner et al., 2012).

Weber (1978) conceives four social action types, namely: (i) rationality in comparison to ends; (ii) rationality in comparison to values; (iii) affective rationality; and (iv) traditional rationality. The final rationality action systematically relates means to ends based on objective knowledge, which is likely scientific. Valuing rationality, in turn, concerns sharing values at the decision-making stage, which have the power to convince people to act. Affective actions involve actions encouraged by emotions (a type of action that was little explored by Weber). Finally, the traditional action is substantiated by managerially inherited habits (Aron, 1970; Burger, 1976; Weber, 1978). The act of reviewing an establishment involves a social action that has an impact on reality due to the fact that this action is exposed to and can trigger reactions in those who have contact with it – mainly when we refer to restaurant reviews whose appraisers can score and comment on the services provided by a given establishment. Accordingly, we can state that the act of reviewing is a social action that expresses the mediation movement between private and public perceptions and that, to some extent, echoes general interests. At this point, we embody the Habermasian logic of the public sphere by understanding that a review involves forms of Weberian rationality; in other words, it is an action type clearly interested in reaching public aspects whose arguments gain visibility through discourse (Habermas, 1991).

Therefore, a review involves public responsibility, since it results from delimiting the actions of another and from publicly exposing this consideration. At this point, the action of reviewing involves forms of public action; therefore, we can also consider Max Weber and his duality: ethics of responsibility and ethics of conviction. Ethics of responsibility (called initially "ethics of power" by Weber) is the action of the legitimate political man who takes into consideration the consequences of his acts. Ethics of conviction (translated as "ethics of inner will"), in turn, makes the individual put their inalienable beliefs and goals in the mainstream (Weber, 2004). Thus, we have a number of implications:

 Weber takes into consideration the public agent by delimiting their actions; however, we can extend the reach of the social action of reviewing when its public manifestation reaches society, which reacts to it;

- (ii) Weber does not separate, nor opposes, the two ethics; actually, both concern human action;
- Ethics of conviction involves idealism, since the public agent is guided by their moralities and view of the world;
- Ethics of responsibility advocates for a "consequentialism," because it leads to causality articulations (Colliot-Thélène, 2014). Therefore, based on the logic of the public sphere, which demands reason (Habermas, 1991), ethics of responsibility is the most compatible with the pragmatism and consequences of actions; it concerns a public moral subject and a non-private one (Souza, 1994).

In analytical terms, we can, however, state that the act of reviewing a restaurant should take into account the fact that this social action calls out the responsibility for the performed act, given that it involves accountabilities that may involve the appraiser's goals, knowledge, moral values, feelings, and personal background – whether in professional or amateur critiques, as mentioned by Monty (2021). Thus, the act of reviewing is not exempt; objectively, it has political and public motivations – therefore, it is a responsible act that demands public ethics.

A significant part of the literature about reviews related to restaurants focuses on food quality, the infrastructure of establishments, customer service, and nutrition (Linhares & Popolim, 2016; Oliveira et al., 2020; Ramos et al., 2021; Savio et al., 2005). Oliveira et al. (2020) analyzed the quality of appraisers' information and knowledge as necessary elements for a correct review, since criteria are required to observe parameters comprising what is so far considered a review. Thus, a responsible review requires knowing not just what is reviewed, but being aware of the reviewed parameters.

On the other hand, Linhares and Popolim (2016) understand that there are expectations and interests that can have an impact on pre-conceived experiences and on the currently experienced ones – this works as the very basis for the review of the impact of services on customer satisfaction. Accordingly, online restaurant reviews provide information and knowledge, as well as working as parameters applicable to the act of reviewing. The question is: to what extent are reviews carried out based on criteria and taking into account information availability and the construction of differentiation between expectation and lived experience?

In times of fake news, this fake news can have aims that do not necessarily meet the proposition of news reports (Delmazo & Valente, 2018). Thus, a fake review can embody a social action profile, whose rationality needs to be explained. Once reviews are public, the appraiser can have privileged access to information capable of building pre-notions and judgements; simultaneously, the purposes of a review can mention its ends.

Based on the aforementioned implications between the Weberian social action and responsibility in the Habermasian public sphere, we can point out the following construction in Table 2, in light of the appraiser types introduced by Cruz et al. (2021).

The study by Cruz et al. (2021) presented the appraiser types, but it did not go into depth on the features related to the content of online reviews. Therefore, we highlight that the elaboration of the hypotheses in the current study is based on the qualitative character of the theoretical-empirical deepening of the associations

### Table 2

# Weberian analysis of social action and responsibility in the Habermasian public sphere based on the online appraiser types matrix

| Online Appraiser Type           | Weberian Analysis of Online Appraiser Types   |  |  |  |  |
|---------------------------------|---|--|--|--|--|
| Real Expert and                 | The act of reviewing based on individuals' knowledge and on their goal of showing acquired experience. The act of   |  |  |  |  |
| Amateur Critic                  | reviewing that gathers information and knowledge, based on the dimension of analyzing and weighing up reality according to the criteria of provided services. There is a higher degree of ethics of responsibility than that of ethics of conviction, because the appraiser has a fair review in mind, as well as its impacts, equally taking into  |  |  |  |  |
|                                 | account distancing from value judgements.   |  |  |  |  |
| Pseudo Expert and<br>Speculator | Act of reviewing based on individuals' own assumptions. The act of reviewing that poorly gathers the produced information and knowledge, or that does not weigh up the lived experience, since it is only substantiated by pre-assumptions and by value judgements about a given action. There is little rationality involved and a higher degree of ethics of conviction than that of ethics of responsibility, since the individual does not use enough criteria to make differentiations and only follows their own moral bases. |  |  |  |  |

Note. Developed from Weber (1978, 2004), Habermas (1991), and Cruz et al. (2021).



 $(\mathbf{i})$ 

between the review, responsibility, and their derivative impacts. Their study focused on evidencing the existence of a social TV phenomenon in Brazil, and its influence on viewers' actions to produce fake online reviews by acting as diners. Our goal is to go beyond the simple search to understand the content of these reviews based on the appraiser types, and to understand the lack of responsibility by those who produce realistic reviews (amateur critics and real experts) in relation to those who produce fake online reviews (speculators and pseudo experts).

Ryu and Han (2010), Harrington et al. (2013), and Bai et al. (2019) added to the appraiser types of Cruz et al. (2021), based on a critical sense of responsibility and on the impacts online reviews have not just on individuals themselves, but also on the public sphere, as well as on management processes. We took this into consideration based on the impact on reviews, articulating the studies by Aureliano-Silva et al. (2021), Zhang et al. (2010), Rahman (2009), Guo et al. (2020), and Kim and Tanford (2019b), as well as inputs in sociological theory, using Turner et al. (2012), Weber (1978, 2004), Burger (1976), Aron (1970), Colliot-Thélène (2014), Habermas (1991), Souza (1994), and Monty (2021) as references.

If we take into account that the speculator appraiser type writes reviews based on their own pre-assumptions (their beliefs), we can state that they disregard the lived experiences and lack criteria at the time they act as diners. Assumingly, there is a lack of public responsibility by speculators when they review restaurants based on a television show; this could be identified in reviews that may be empty (without comments) and that only show star scores. Thus, we have hypothesis  $H_1$ :

H<sub>1</sub>: Speculators tend not to present comments in their reviews (only star scores).

We assume that pseudo experts behave similarly to speculators when it comes to review contents – they lack comments, make short comments, or even make comments that are not related to online reviews of restaurants. Cruz et al. (2021) pointed out that pseudo experts can benefit from Google because they are local guides (they are experienced in writing reviews on the Google Review platform) – this process can influence the appraiser type's commitment to producing reviews on this platform. This context suggests that reviews by these appraiser types may not have the features identified in the literature about restaurant reviews, such as price, customer service type, food, customer service speed, food safety, menu variety, and distance to reach the restaurant, as pointed out by Bai et al. (2019), Ryu and Han (2010), and Harrington et al. (2013). Thus, we have hypotheses  $H_{\gamma_2}$  and  $H_{\gamma_2}$ :

- H<sub>2a</sub>: Pseudo experts tend not to present comments in their reviews.
- H<sub>2b</sub>: Pseudo experts do not describe an experience as diners in their comments.

On the other hand, we believe that the appraiser types called amateur critics and real experts – because they do not produce fake online reviews and are real diners – present content in their reviews that is close to features already addressed in the literature about restaurant reviews, such as price, food quality, customer service quality, customer service speed, and environmental cleanliness.

Thus, we assume that reviews by both amateur critics and real experts are longer because they describe an experience and are aware of their public responsibility, a fact that evidences an acquired experience (real expert) based only on a few rational criteria, on their experience lived as diners; these appraisers do not depart from their value judgement (amateur critic). Thus, we have hypotheses  $H_{3a}$  and  $H_{3}b$ :

 $H_{3a}$ : Amateur critics present comments with more contents; they contribute to describing an experience.

 $H_{3b}$ : Real experts present comments with more content; they contribute to describing an experience.

## 4 Method

We adopted the quantitative research type, based on descriptive statistics, cluster analysis, and on the creation of dictionaries for experience with diners and social TV by building algorithms in the R language. A database (Appendix A. Supplementary Data 1 – Database) was built to replicate the methodological strategy adopted by Cruz et al. (2021) to create the following groups: amateur critics and real experts, and speculators and pseudo experts, based on cluster analysis (Appendix B. Supplementary Data 2 – Coding in R Language for Cluster Creation). The specificities of this methodological approach are presented below.

# 4.1 Data collection and creation of clusters

The seven restaurants participating in the second season of the TV show "Kitchen Nightmare" received a total of 6,344 reviews (more than double the original study), which were gathered through data screening



from the most recent to the oldest ones – it was possible to collect 930 reviews per restaurant. If in the study by Cruz et al. (2021) there was manual data collection, we adopted an automatized system based on an algorithm – this is a relevant methodological decision that can be updated in other studies.

The Google webrobots.io extension via Instant Data Scraper was used to carry out the screening, as observed in Appendix A (Supplementary Data 1 – Database). Thus, it was possible to collect the following variables in XLSX format: (a) being or not being a local guide; (b) link to the appraiser's profile; (c) number of the appraiser's previous reviews; (d) number of stars in the written review; (e) content of the written review; (f) number of likes received from third parties in the review; and (g) day of the review.

After gathering all this information, it was possible to reproduce the cluster analysis presented by Cruz et al. (2021), based on the Gower distance recorded at the time to calculate the dissimilarity matrix (Gower, 1971), according to the dummy variables (a) local guide and (b) real experience – this can be observed in Appendix B (Coding in R Language for Cluster Creation). Therefore, there was discrimination based on the four groups – as can be seen in Figure 1. These groups allowed for a descriptive analysis to address the hypotheses in the current study.

### 4.2 Descriptive analysis

This approach was used to empirically assess the hypotheses results. The calculation applied to the total and mean number of characters per review, number of comments, number of blank comments (missing values), the mean and standard deviation of star scores, and the number of reviews per cluster, are based on this approach. A Spearman's correlation matrix was developed to assess the association between "number of reviews," "number of stars," "number of characters per review," and "number of likes by third parties, per review."

In addition, a contingency table was created based on the cluster analysis groups (local guides and real experience) to label the amateur critic, real expert, pseudo expert, and speculator groups. This table allowed for  $H_{2a}$ to be addressed and  $H_{3a}$  and  $H_{3b}$  to be partly addressed. Bigrams provided the answer to  $H_{2b}$  and completed the answer to  $H_{3a}$  and  $H_{3b}$ .

### 4.3 Bigram development in R language

N-grams are sequences of adjacent words built from an algorithm in R language. A bigram is a sequence of two words statistically generated from a *corpus* (Silge & Robinson, 2016). According to Wickham (2014), data cleansing to generate a *corpus* is essential because there are several meaningless words such as "https," "www," "#,"









and emojis. This cleansing process enabled us to create a database in the tidy format in the R language.

Accordingly, the unnest\_tokens function of the tidytext package was used to create the bigrams in the R language by creating four subgroups for this *corpus*; this methodological strategy can be accessed in Appendix C (Coding through R Language for Bigram Creation). In total, 6,344 reviews were divided based on the amateur critic (n = 1,445), real expert (n= 2,458), pseudo expert (n= 325), and speculator (n= 2,116) groups in order to create the bigrams of each appraiser type. The algorithm automatically provided 100 bigrams per appraiser type as an output, but we opted to only choose the first 10 for the current analysis.

## 5 Results

The clusters resulting from the 6,344 reviews allowed for a better understanding of the general features of the four groups formed from the production of real and fake reviews. Before the TV show was broadcasted there were only 66 reviews carried out by speculators, but this number rose to 2,050 after it went on air and on YouTube. Thus, there were only 66 reviews before the show went on air, but after it went on air, and became available on the internet, the number of reviews rose to 2,050, almost 2,000 reviews more.

Table 3 summarizes the descriptive statistics regarding some of the herein systematized variables, such as the mean and standard deviation, which were applied to the number of stars scored by the appraiser, to the reviews, to the number of characters in the reviews, and to the number of likes from third parties for a review written by the appraiser.

# 5.1 How real experts and amateur critics evaluate restaurants

The groups of experienced diners (real experts and amateur critics) and the unexperienced ones (pseudo experts and speculators) recorded different means; i.e., those who had a real experience gave a larger number of stars than those who did not. The real expert and amateur critic groups wrote their reviews based on their acquired knowledge and the aim of their reviews was to show expertise at the time to write a review in order to feature their sense of accountability for what was reviewed within the service provision context. This can be observed in texts that add clear terms about the lived experience, flavor, and sensations – this is an objective part of the act of reviewing within the gastronomic context – similarly to the observations by Pudlowski (2011).

The real expert writes reviews without caring about showing authority to perform the act of reviewing, for example "a little careless with appearance and cleaning" or "excellent food and fair price"; they are objective, clear, and straight-to-the-point about what they can be accountable for. Their terms are less qualitative and quite straight forward, such as "Indian" and "customer service," which do not contain any value judgement. On the other hand, the amateur critic tries to show critical competence by choosing qualitative terms that guide their reviews, for example "(...) the dishes are well-served and prepared with excellent ingredients" or

### Table 3

| Descriptive statistics of systematized | variables | (contingency table) |
|--|-----------|---------------------|
|--|-----------|---------------------|

| Variables                           | Amateur Critic | Real Expert | Pseudo Expert | Speculator |
|-------------------------------------|----------------|-------------|---------------|------------|
| n                                   | 1,445          | 2,458       | 325           | 2,116      |
| Local Guide                         | No             | Yes         | Yes           | No         |
| Real Experience                     | Yes            | Yes         | No            | No         |
| Mean stars of review                | 4.22           | 4.24        | 3.75          | 4.00       |
| SD of stars                         | 1.34           | 1.09        | 1.64          | 1.55       |
| Mean reviews of reviewer            | 8.72           | 65.40       | 31.21         | 3.18       |
| SD of reviews                       | 32.32          | 93.25       | 62.34         | 12.58      |
| Mean number of characters of review | 101.07         | 94.65       | 44.99         | 15.61      |
| SD of characters in review          | 195.87         | 170.79      | 104.70        | 54.47      |
| Mean number of likes of review      | 0.97           | 0.57        | 4.48          | 0.84       |
| SD of likes in review               | 8.08           | 6.26        | 18.67         | 6.14       |

Note. Source: Elaborated by the authors based on field research

"(...) the space is small and cozy" – thus, it is possible to observe the care taken with the chosen terms. At the same time, they use terms such as "wonderful," "good," "excellent," and "delicious."

Briefly, the sense of argumentation by real experts and amateur critics provides a perspective about the provided service, which is substantiated by the experience actually lived. The core factors guiding these two actors involve the judgement of the objective and a clear critique (although this is a little less expressive in the reviews of the amateur critic – who tries to show their competence at the time to evaluate), which is supported by the commitment to translate the act of reviewing in a real way. Real experts and amateur critics articulate a correct review based on the quality of information, criteria, and knowledge, as highlighted by Oliveira et al. (2020) regarding restaurant reviews.

This fair act that translates the experience is what we called public responsibility of the review, since this review act will be exposed to other appraisers – at this point, responsibility is accessed based on its clarity and objectivity; moreover, the translation experience (weighed up based on its purpose to add to a person) is at stake. Such responsibility complies with the ethics of responsibility because a broad range of causal bases substantiates it.

We can herein show one more difference between the real expert and the amateur critic. Both weigh up scores based on a lived experience. This difference lies in the fact that the real expert does not necessarily give a score as a review measure, but the textual translation of their experience, whereas the amateur critic focuses on translating either the text in the score and their own experience, given their on-going gastronomic evaluative trajectory. The amateur critic focuses on elements outside the gastronomic experience that the real expert is not focused on (probably because they do not take into account such elements as part of the experience itself). One amateur critic states that "(...) unfortunately, I saw many owners being rude with employees, and this is the reason for their 3 star score"; this is the justification for the score given to a restaurant. In a way, reviews like this one highlight how far the variables are from diners' viewpoint, since they go beyond the experience with the food and the service and they do not act as observers who believe they have the right to review a restaurant.

# 5.2 How speculators and pseudo experts perform as appraisers

The reviews written by speculators and pseudo experts are not able to cover the reality of the experience (whether in textual translation or scores), because there is no link between knowledge, experience, and responsibility in their act of reviewing. Accordingly, both act based on the ethics of conviction, but to a higher degree than that of the ethics of responsibility.

As highlighted by Linhares and Popolim (2016), expectations about, and interest in, pre-conceived experiences build the conviction framework these appraisers are closely connected to. Thus, it is possible to observe how scores given by speculators and pseudo experts can change, but they are in line with review trends, since there is no critical dimension regarding the responsibility of the act of reviewing in compliance with the performative act of gastronomy.

Therefore, we can infer that the review act that separates responsibility from experience in the dynamics of translating gastronomic experiences is an act of irresponsibility towards the public sphere, since it concerns describing an act that does not match reality and that, consequently, adheres to what a restaurant aims to provide as a gastronomic experience. All restaurant review acts on online platforms are public review acts that work as parameters for other appraisers, featuring the dimension of public responsibility of the review. Nevertheless, it is necessary to bear in mind that both the text and the score are review measures that must be observed based on their public aspect.

Thus, the speculator may understand that the mean star score observed in the current sample was close to 4 stars. Therefore, it is possible to understand that the appraiser tended to give a larger number of stars, although there were not a large number of them in reviews available on the platform (even if this score does not reflect the experience as a diner). The same was observed for the pseudo expert group – which recorded a mean of 3.75. Thus, it is possible to understand that the speculator and pseudo expert groups tend to grant scores ranging from 3.75 to 7 stars to these establishments (even if they do not have a previous history of reviews on the platform).

The pseudo expert (rho = -0.1209332, p-value = 0.02928), real expert (rho=-0.0818608, p-value = 0.00004839), and speculator (rho=-0.08268849, p-value 0.0001401) groups recorded a significant and negative

correlation in the variables "stars" and "history of reviews on the platform" (being a local guide). This finding suggests that a larger number of reviews tend to generate a smaller number of stars in the analysis of the establishment. This correlation was not significant in the group of amateur critics (p-value = 0.1161); the number of reviews in this group seemed to disregard the number of stars.

The function of a gastronomic critic described by Pudlowski (2011) points out that people with real experiences tend to be more careful in their real reviews, and this reinforces the result herein recorded for the negative and significant correlation observed in the real expert group. In other words, the real expert appraiser acts as a professional critic when they review the features of commensality; thus, although they are in the habit of writing reviews, they do not usually give 5 stars, since they seem to be more judicious as gastronomic critics. Based on this result, it is curious to observe that the pseudo expert seems to have more ethics of conviction than ethics of responsibility, since they do not assess commensality features.

Table 4 shows the results that allowed us to address the first hypothesis of our study  $(H_1)$ , since 77.84% of speculators did not write their reviews – not even one character (not even a period, exclamation point, or any letter or sign). Thus, it is possible to understand that, overall, speculators only give reviews through the "number of stars" tool. The information in Table 2 also helps to address  $H_{2a}$ : pseudo experts do not present any characters in 60.92% of their reviews.

We must highlight that the act of responsibility implies translating the experience based on knowledge (whether information or previous experience). This translation is substantiated by texts and scores; texts are subjective and scores are objective. Translating an experience means building a knowledge and experience framework capable of being used as a parameter. However, this does not mean that such an act is irresponsible. See the example of the real expert and amateur critic groups, which recorded 32.22% and 22.84% of blank reviews, respectively – real experts have knowledge and experience, but amateur critics can try to show some knowledge given their ongoing trajectory; they are different from real experts, who tend to show the gastronomic experience itself. Still, both appraisers act based on the ethics of responsibility and understand that the review act concerns descriptively showing the experience.

This context is different from that of speculators and pseudo experts, who simply cannot translate this experience due to a lack of knowledge (whether information or previous experience). They give reviews based on their own pre-conceptions and value judgements about a given action. This process is explained by a comment made by one pseudo expert: "(...) turn off your freezer at night"; or by one speculator: "I never went there, but as they are giving negative reviews without going there, I will give a positive review."

The speculator's terms are intentionally associated with television shows about restaurants, such as the case of "turn off" and "freezer" ("turn off the freezer at night"), "shut-up" (which refers to the show's host, who says "shut-up"), or "Erick" and "Jacquin" (which refer to the show's hosts). The pseudo expert, in turn, also uses terms close to the aforementioned ones, such as the case of "TV show" and "nightmare" (to refer to the Kitchen Nightmare show), "night," "turn-off," and "freezer" (to refer to "turn off the freezer at night"). The only term referring to quality, in both cases, is "good."

It is possible to observe that there is no concern about associating responsibility with experience in the dynamics to translate the gastronomic experience in these two groups. Thus, there is no public responsibility in speculators' and pseudo experts' review acts since they are built based on the ethics of conviction. This

# Table 4Reviews with and without characters per groups

| Туре           | Total | Total blank reviews | Total reviews | % of blank reviews | % of reviews with characters |
|----------------|-------|---------------------|---------------|--------------------|------------------------------|
| Amateur Critic | 1,445 | 330                 | 1,115         | 22.84              | 77.16263                     |
| Real Expert    | 2,458 | 792                 | 1,666         | 32.22              | 67.778682                    |
| Pseudo Expert  | 325   | 198                 | 127           | 60.92              | 39.076923                    |
| Speculator     | 2,116 | 1,647               | 469           | 77.84              | 22.164461                    |

Note. Source: elaborated by the authors based on field research.

scenario gives birth to a public sphere where one finds a gap in insights regarding the reach of the review act of an individual who produces information that works as a parameter to be analyzed by others. This concerns the intentional fake construction of reality; therefore, it is a fake online review created from ethics of conviction. According to Delmazo and Valente (2018), irresponsibility is shown in the induced dubiety dimension, which can embody elements that do not meet the proposition of the given review.

Table 5 gathers examples of reviews by the four appraiser types in the present investigation.  $H_{2b}$  (pseudo experts do not describe an experience as diners when they make a comment), H<sub>3a</sub> (amateur critics make comments with more content that contribute to the description of an experience), and H<sub>3b</sub> (real experts make comments with more content that contribute to the description of an experience) cannot be answered by this chart, although it allows for an understanding that both the amateur critic and the real expert have common features that were already discussed in restaurant reviews available in the literature, such as food, service, cleaning, and location - as observed by Bai et al. (2019) and Harrington et al. (2013). The pseudo expert and speculator groups, in turn, did not worry about discussing the features often observed in an online restaurant review; they only focused on discussing the content seen in the TV show.

The algorithm construction in the R language to generate the statistical results to associate words led to complementary results for the hypotheses in this

investigation. As shown in Table 6, the bigrams resulting from the 6,344 reviews for the four groups of appraisers show a clear difference between the amateur critic and real expert groups, and the pseudo expert and speculator groups. It is possible to observe expressions that refer to features found in the literature about online restaurant reviews either by amateurs or real experts (food, service, and price). Expressions by speculators and pseudo experts are related to TV show information, rather than to experiences as diners - the "food" feature only appeared once in these two groups.

## 6 Final considerations, theoretical implications, and further research

We can state that there is no public responsibility by the speculator and pseudo expert appraiser types in the production of reviews because these individuals act based on the ethics of conviction. Thus, for this dataset, and based on the Habermasian logic of the public sphere, we can state that appraisers who produce fake online reviews do not act based on the ethics of responsibility perspective. Thus, we can answer our first question of the present study: there is no public responsibility in the review parameters applied by speculators and pseudo experts when they are compared to amateur critics and real experts. Table 7 summarizes the results and conclusions of this investigation.

Nevertheless, amateur critics and real experts translate their experience into qualitative texts in a

## Table 5 Examples of comments collected from the reviews, based on appraiser type

| Group          | Example Comment   |  |  |  |
|----------------|---|--|--|--|
| Amateur Critic | "Tasty dishes. I loved the <i>funghi</i> risotto. The dishes are well served and cooked with excellent ingredients. I recommended |  |  |  |
|                | it!"  |  |  |  |
|                | "I ordered the salmon with cassava cream and rice. It was great. The staff is polite and the place is calm and cozy. The          |  |  |  |
|                | food was served quite fast."  |  |  |  |
|                | "Excellent food, a wide variety (pasta, meat, risotto, all ready to eat or to-go), good cost/benefit. Small and cozy space.       |  |  |  |
|                | Unfortunately, I saw the owner being rude to employees, and it is a 3-star score."  |  |  |  |
| Real Expert    | "Simple place, but good food."  |  |  |  |
|                | "Great food and fair price."  |  |  |  |
|                | "A little careless with appearance and cleaning."   |  |  |  |
| Pseudo Expert  | "Turn off the freezer at night."  |  |  |  |
| *              | "Watching Kitchen Nightmare, the team is awesome, they all like each other, and I wish them all luck."                            |  |  |  |
|                | "Kitchen Nightmare on Band Show, congratulations, I wish you success."  |  |  |  |
| Speculator     | "I have never been there, but as they are giving negative reviews without going there, I will give a positive review."            |  |  |  |
| -              | "I just watched the show."  |  |  |  |
|                | "I wanted to talk to the owner hahaha."   |  |  |  |

Note. Source: elaborated by the authors based on field research.



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| rank |            | Amateur Critic |    |               | Real Expert |    |
|------|------------|----------------|----|---------------|-------------|----|
|      | word 1     | word 2         | n  | word 1        | word 2      | Ν  |
| 1    | food       | is             | 45 | food          | is          | 84 |
| 2    | food       | good           | 36 | food          | good        | 64 |
| 3    | food       | excellent      | 32 | price         | fair        | 61 |
| 4    | good       | service        | 26 | food          | Indian      | 59 |
| 5    | food       | excellent      | 26 | good          | food        | 48 |
| 6    | Great      | service        | 26 | is            | well        | 44 |
| 7    | food       | Indian         | 24 | good          | service     | 39 |
| 8    | price      | fair           | 23 | great         | service     | 39 |
| 9    | super      | recommend      | 22 | service       | is          | 36 |
| 10   | food       | delicious      | 19 | food          | delicious   | 34 |
| 1    | Speculator |                |    | Pseudo Expert |             |    |
| rank | word 1     | word 2         | n  | word 1        | word 2      | Ν  |
| 1    | night      | Turn-off       | 15 | have          | gone        | 6  |
| 2    | five       | stars          | 12 | gone          | there       | 4  |
| 3    | Turn-off   | freezer        | 8  | twelve        | hours       | 3  |
| 4    | twelve     | hours          | 5  | five          | stars       | 3  |
| 5    | food       | is             | 5  | good          | luck        | 3  |
| 6    | Fábio      | is             | 5  | In this       | restaurant  | 3  |
| 7    | hear       | Shut-up        | 5  | never         | have        | 3  |
| 8    | good       | luck           | 4  | show          | nightmare   | 3  |
| 9    | is         | good           | 4  | night         | Turn-off    | 2  |
| 10   | Erick      | Jacquin        | 4  | Turn-off      | freezer     | 2  |

# Table 6Bigrams identified based on online appraiser types.

Note. Source: elaborated by the authors based on field research

# Table 7Investigation hypotheses and answers

| Hypotheses  | Result  | Conclusion  |
|---|---|---|
| Speculators tend not to make<br>comments in their reviews (only<br>giving stars)                      | 77.84% only gave stars in their reviews   | Speculators and pseudo experts tend to only give a score to a given experience; they exert the act of reviewing based on pre-<br>conceptions, without clear and rational criteria, based on clear   |
| Pseudo experts tend not to make<br>comments in their reviews  | 60.92% of them left blank spots<br>in comparison to the amateur<br>critics – who left 22.84% blank<br>comments in their reviews | ethics of conviction. There is a discernment gap in the reach of the<br>evaluative act. At the same time, there is the intention to produce a<br>fake reality, thus, a fake online review.  |
| They present comments that do<br>not describe an experience as a<br>diner                             | The bigrams did not show<br>features that describe an<br>experience as a diner  | The identified bigrams are not related to features that are often used<br>by other diners. Appraisers in this group focused on written reviews<br>that translate their experience as viewers of a culinary reality show.  |
| Amateur Critics make comments<br>with more content that<br>contribute to describing an<br>experience  | blank and the identified bigrams<br>were related to features discussed<br>in restaurant reviews                                 | Based on this database, this was the group with the largest number<br>of characters – 101 characters, as opposed to 15 characters by<br>speculators, 95 by real experts, and 44 by pseudo experts.<br>Amateur critics and real experts associate responsibility with  |
| Real experts make comments<br>with more content and they<br>contribute to describing an<br>experience | 67.78% of the reviews had at<br>least one character in the written<br>texts of the reviews                                      | experience in the dynamics to translate the gastronomic experience;<br>they aim to describe a scenario close to what they propose as a<br>gastronomic experience. There is notable emphasis on the ethics<br>of responsibility. Amateur critics apply value judgement more<br>than real experts, because they are still building their gastronomic<br>trajectory. Therefore, they may observe elements that are not<br>necessarily part of the service, the environment, the establishment,<br>and the food |

Note. Source: elaborated by the authors based on field research

differentiated way; they provide more content and describe the experience, whether with a high- (and more technical) or low-experience (more sensory and emotional) gastronomic trajectory. Accordingly, they regard critical messages that can be taken as valid based on the functional and emotional experience (Aureliano-Silva et al., 2021; Li et al., 2019; Parikh et al., 2017; Standing et al., 2016); they will likely have an impact on the adherence to a service or inclination to have the experience (Aureliano-Silva et al., 2021; Kim & Park, 2017; Li et al., 2019).

At the same time, we observed that reviews begin from parameters known by appraisers; these parameters can start from technical or emotional bases, and are difficult to methodologically replicate when they are freely exerted by appraisers – they are partly prescriptive and scarcely explanatory (Alkin et al., 2021; Coryn et al., 2011; Kim & Tanford, 2019a; Mariani et al., 2019;). Finally, reviews have personal bonds and publicity regarding an experience, and this depends on technical and emotional issues; thus, they can delimit aspects that do not comply with the reality of service provision processes (Aureliano-Silva et al., 2021; Parikh et al., 2017; Zhang et al., 2010) – accordingly, we evidenced the dimension of the ethics of responsibility.

### 6.1 Study limitations, theoretical and managerial implications, and future research

The findings in this investigation are specific to the analyzed context. The fact that the results cannot be extrapolated to other contexts (countries, economic sectors, or cultures) is a research limitation. In addition, the sample cut is not probabilistic; therefore, it does not allow for generalizations, even in the Brazilian context. However, this investigation presents theoretical and managerial implications, as well as contributing to paving a road for further research related to online appraiser types.

Cruz et al. (2021) evidenced four online restaurant appraiser types who performed as diners based on the influence of TV on viewers, but the present investigation contributed to studies related to online restaurant appraiser types in four different ways, namely: (i) it increased the number of observations and proved that the appraiser types remained the same; (ii) it identified the types of appraisers who could present responsibility and the ethics of conviction in light of the Weberian and the Habermasian theories; (iii) it evidenced that speculators and pseudo experts tend not to write contents in their and (iv) it showed that speculators and pseudo experts follow the ethics of conviction, and that amateur critics and real experts act based on the ethics of responsibility. Briefly, while Cruz et al. (2021) only evidenced the four types of online restaurant appraisers, and divided them based on real experience and review experience, we went much further and deepened the understanding about the public responsibility of reviews; we revealed the motivation type, and the content (real or fake experience) and the shape (with or without characters) of reviews, as well as showing that the groups of speculators and pseudo experts act based on the ethics of conviction perspective.

reviews, but instead just grant a given number of stars;

These four findings are relevant to help in understanding the behavior of online appraisers in studies related to online reviews and to fake online reviews. With respect to fake online reviews, we added an overview associated with the shape and content of reviews to the literature. As for the shape of reviews, there are individuals who only score using a star rankings (they do not write any information); there are others who only do so through a ranking and who write at least one character. Regarding content, we understand that there are reviews built based on features that describe the experience, and reviews that do not describe it. Although the association between the restaurants sector and TV influenced the elaboration of fake online reviews by viewers in this study, the results presented herein can be considered based on information from other sectors and contexts.

With respect to the general implications, we suppose that understanding the content and the shape of these reviews can support the arguments presented by restaurant managers and owners (or by representatives from other ventures, from other sectors) to force the platform to rule out reviews that do not describe a real experience. As for the seven restaurants assessed in the current study, their scores were influenced by the broadcasting of the show on the Google Reviews platform – mainly because of fake online reviews. Similarly, we believe that the results in the present study can even help in decision-making by other people in leadership positions in companies, when it comes to participation in reality shows - exposure on TV can be good, but it can also bring losses. The third implication lies in discussing how we think a consumer's education process is related to online reviews, in that they can be carried based on the ethics of responsibility, rather than based on strong traits of the ethics of conviction.

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We also pointed out development through reviews, based on the perception about stimuli in reviews as general contributions based on sensory elements of a broader experience (Guo et al., 2020; Rahman, 2009), rather than the mere and pure functional or emotional critique (often limited to experts or amateur critics), as well as encouraging reviews to be given right after the service is provided in order to cover the moment of the experience (Li et al., 2019). We highlighted that the part played by online reviews can cover a cycle articulated according to: 1) producing an assessment about the development of services and about their quality; 2) the design of corrective and potential propositions; 3) supporting decision-making in relation to feasible and pertinent comments; 4) placing it as a methodological part of implementing monitoring; and 5) allowing for a feedback tool.

We pointed out that the design of reviews must allow for parametrization, as well as explanation (Alkin et al., 2021; Coryn et al., 2011) and, simultaneously, we emphasize service consumers' accountability for the description given (Aureliano-Silva et al., 2021; Parikh et al., 2017; Zhang et al., 2010). Thus, online reviews represent critique strategies (Kim & Tanford, 2019b), rather than just reactions (Kalnins & Mayer, 2004).

Future research in different fields of knowledge and with different aims can be developed based on fake online reviews, on their contents and shapes, in light of the appraiser types and the Weberian and Habermasian discussion. Some research questions open up room for reflections about new research lines triggered by the current results. For example, disregarding a company that has participated in a TV show, we would have the following research questions: (i) what are the motivations for a speculator to write a fake online review? (ii) with respect to content, do speculators tend to write reviews with characters or leave them blank? If they write them, do they try to act as real consumers? (iii) do appraisers tend to more closely follow the ethics of responsibility in their reviews about small businesses than in their reviews about big companies? These and other questions can be answered by future studies that would start from the proposition presented here.

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## **Supplementary Material**

Supplementary material accompanies this paper. Appendix A. Supplementary Data 1 – Database Appendix B. Supplementary Data 2 – Coding in R Language for Cluster Creation Appendix C (Coding through R Language for Bigram Creation) This material is available as part of the online article from https://doi.org/10.7910/DVN/MY0DQR

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The authors have no conflict of interest to declare.

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