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Understanding online fake review production strategies

Abstract: Extending the literature that has, thus far, mostly focused on the detection of fake online reviews, this paper explores a more fundamental yet hitherto-unanswered question: How do people go about creating fake reviews in the first place? To delve deeper, it further investigates the role of individuals' cognitive style—the way one gathers, processes, structures, and applies information. While cognitive style was measured using a quantitative scale, a qualitative approach was adopted to explore fake review production strategies. Fifty participants imagined that they had been hired by a marketing agency to write fake reviews, completed the writing task, shared their experiences, and then filled out a cognitive style questionnaire. Writing fake reviews involved four stages: gathering information, assimilating information, drafting the fake review, and finalizing the fake review production. Through a cognitive lens, the paper uncovers three fake review production strategies and explains why someone would adopt a certain strategy.

Keywords: e-WOM; fake online review; fake review production strategy; online review writer; review fraud; review writing

Understanding online fake review production strategies

1. Introduction

One of the types of online content that has been used unscrupulously for marketing purposes is fake reviews (Casaló et al., 2015; Dacko et al., 2020; Luca & Zervas, 2016; Plotkina et al., 2020): bogus evaluations of products and services written without genuine post-purchase experiences (Banerjee et al., 2015). Their effect on consumer sentiment, purchase decision, and sales volume can be significant (Zhuang et al., 2018). The recent boom in online purchase due to COVID-19 has further aggravated the problem as many businesses were found to have paid third-party agencies to churn out fake reviews in order to create a buzz about their offerings and edge out their competitors (Rowlands, 2020).

Current marketing automation using natural language generation (NLG), although capable of personalizing email replies or generating voice assistant responses (Müller & Christandl, 2019; Reisenbichler et al., 2021), has not reached the level of sophistication required to produce fake reviews that can consistently evade detection algorithms. For one, NLG requires inputs and outputs to be well-defined (Brynjolfsson & Mitchell, 2017). Produced under these constraints, templated fake reviews tend to contain texts with limited diversity and could be blighted by other glaring issues such as spelling mistakes (Yao et al., 2017). Therefore, so long as NLG-based fake reviews can be called out easily, they are unlikely to be widespread.

Nevertheless, fake reviews are estimated to range between 16% (Luca & Zervas, 2016) and 40% (Young, 2018) of all reviews posted. This suggests that there must be a sufficiently large group of lay Internet users who—for reasons that could range from malicious to benign—are devoted to writing reviews based on imagination rather than genuine post-purchase experiences. This behavior of writing fake reviews has, however, hardly come in the research spotlight.

Moreover, what little scholarly attention on fake reviews exists has largely been trained on detection. To separate fake reviews from genuine ones, researchers frequently leverage computational algorithms that run the gamut from supervised learning (Banerjee et al., 2015) and unsupervised learning (Yu et al., 2019) to semi-supervised learning (Rout et al., 2017) and graph-based mathematical models (Wang et al., 2018). Their findings point to the textual characteristics of review content such as exaggeration, and metadata of reviews such as multiple submissions from a group of user accounts within short time intervals as tell-tale signs of fraud (Ramalingam & Chinnaiah, 2018; Rout et al., 2017; Wang et al., 2018).

Despite ongoing efforts, current detection algorithms have yet to be proven effective in practice (Luca & Zervas, 2016; Reyes-Menendez et al., 2019). This is because NLG-based bots, which are often used in computational experiments, tend to produce largely consistent patterns when compared with human spammers who are more intuitive and less predictable (Leimkühler et al., 2021). Moreover, as fake reviewers grow in sophistication, it becomes harder to weed out phony entries algorithmically. In the protracted battle against fake reviews, a more fundamental question that has remained under the radar is this: How do people go about creating fake reviews in the first place? While the literature has shed some light on machine-generated fake reviews (Juuti et al., 2018), there is a dearth of studies on how humans create such bogus entries (Wu et al., 2020). Filling this gap by acquiring a deeper scholarly understanding of how fake reviews are composed could partially account for the subpar performance of existing detection algorithms and potentially set the stage for better detection strategies.

Hence, the objective of this paper is to explore how people produce fake reviews. Given the ethical and methodological challenges involved in accessing elusive professional spammers, the scope is confined to Internet users with the experience of writing online reviews. Since writing fake reviews represents a complex situation that does not fit any a

priori theory, a grounded theory approach was adopted with the intent to develop an empirically grounded theory of fake review production strategies (Glaser & Strauss, 1967).

To delve deeper, the paper examines the nuances in fake review production strategies as a function of users' cognitive style—the way one gathers, processes, structures, and applies information (De Stobbeleir et al., 2011; Hodgkinson & Sadler-Smith, 2003). Cognitive style is an important construct because fake review production is an inherently information-intensive activity that demands mental efforts. A fundamental determinant of actions in any work performance, cognitive style has been shown to affect problem-solving, decision-making, communication, information processing, and creativity (Cools & Van den Broeck, 2007). However, it has yet to be applied in the context of online review writing.

The paper makes several important contributions. First, it represents one of the earliest efforts to shed light on the issue of fake review production strategies, which has received little research attention thus far. In so doing, it answers the recent call for research on how fake reviews are created (Sahut et al., 2021; Wu et al., 2020). A better understanding of how fake reviews are written may pave the way for the development of more effective detection algorithms. Second, through a cognitive lens, the paper uncovers three major fake review production strategies, identifies the stages involved, and offers an explanation as to why someone would adopt a certain strategy. Thus, it elucidates the underlying psychological mechanism of fake review writing.

2. Related Literature

2.1. Writing online reviews

The reasons that compel individuals to write online reviews have drawn much research interest. Some motivations commonly identified include altruism, challenge-seeking, identity-building, and the need for autonomy, reputation-building, and a sense of belonging

(Cheung & Lee, 2012; Hennig-Thurau & Walsh, 2003; Mathwick & Mosteller, 2017). More recently, the concept of a motivation mix has been proposed (Burtch, 2018; Wu, 2019). Review writers were found to be motivated by different factors as they rise through the ranks in the online community. For instance, while a novice could find intrinsic enjoyment in writing, one who is close to earning a reputation badge is likely to be driven by the need for recognition (Wu, 2019).

Research has also revealed details on how reviews are written. Reviews typically present either a one-sided or a balanced perspective. One-sided reviews maintain an evaluative tone and express either approval or disapproval unequivocally while balanced reviews tend to be more descriptive in reporting both pros and cons (Forman et al., 2008; Stoddard et al., 2016; Zhu et al., 2020). When it comes to one-sided reviews, differences in individuals' approaches to praise and criticism have also been identified: Positive reviews justify expectation confirmation and satisfaction whereas negative entries are written to explain expectation disconfirmation and dissatisfaction (Nam et al., 2020).

However, these works implicitly deal only with authentic reviews. A notable exception in the literature is Thakur et al. (2018), who studied motivations to post bogus entries. Factors found to compel fake review writing intentions ranged from brand love to perceived betrayal and a thirst for revenge. Another related line of inquiry has revealed that fake reviews, in order to grab readers' interest, are often fraught with exclamation marks and affective words such as "awesome" and "awful" (Banerjee & Chua, 2017; Ott et al., 2011). However, many templated fake reviews produced using NLG can be called out easily using detection algorithms (Yao et al., 2017). This has led to the emergence of "fake review farms" that hire individuals to write fake reviews (Knapman, 2019). Although fake reviews are openly bought and sold online (Box & Croker, 2018), how users write bogus entries based on imagination—a cognitively challenging task (Hancock et al., 2004; Hartwig et al., 2011; Juuti

et al., 2018; Plotkina et al., 2020; Tausczik & Pennebaker, 2010)—is not yet well understood. Expectedly, a recent systematic literature review on fake reviews has called for research to cast the spotlight on fake review writers and their writing strategies (Wu et al., 2020). Given the under-theorized nature of the phenomenon, this paper adopts a grounded theory approach to inductively theorize how individuals write fake reviews. Moreover, it explores the possibility of mapping fake review production strategies to cognitive style.

2.2. Cognitive style

Cognitive style has been recognized as a major factor that shapes individuals' information processing behaviors, including performance in writing tasks (Cools & Van den Broeck, 2007, 2008; De Stobbeleir et al., 2011; Hodgkinson & Sadler-Smith, 2003). As writing fake reviews is an information-intensive and cognitively challenging activity (Juuti et al., 2018; Plotkina et al., 2020), cognitive style is deemed to be a relevant concept.

A nuanced conceptualization of cognitive style holds it to be three-dimensional involving three styles: knowing, planning, and creating (Cools & Van den Broeck, 2007). A high degree of knowing style places great emphasis on data, details, facts, and logic. High-knowing individuals look for rationality, try to develop objective solutions to problems, exercise caution in evaluating information, and are able to present arguments based on evidence. A high degree of planning style is characterized by a need for control, certainty, structure, and preparation. Planners tend to be well-prepared, have conventional routines, follow a systematic approach to process information, and are able to produce predictable and cohesive arguments. Finally, a high degree of creating style is associated with the proclivity for creativity, freedom, and experimentation. Viewing rules as obstacles, such individuals tend to be impulsive, spontaneous, innovative, and are able to devise unconventional arguments against detractors (Cools et al., 2012).

In the context of writing fake reviews, which requires not only the effort to concoct falsehoods persuasively but also a dose of imagination (Juuti et al., 2018; Plotkina et al., 2020), all three dimensions of knowing, planning, and creating appear to be at play. Pure knowers are expected to invest efforts into seeking information for writing fake reviews, pure planners are anticipated to stick to a methodical course of action, and pure creators could write the most creative bogus entries (Cools & Van den Broeck, 2007; Cools et al., 2012; De Stobbeleir et al., 2011; Hodgkinson & Sadler-Smith, 2003). Nonetheless, since individuals may also exhibit each of the three dimensions of cognitive style to varying degrees, this paper employs a cluster analysis to identify different archetypes of cognitive style, and then explores how these archetypes shape the strategies of producing fake reviews that are uncovered using grounded theory.

3. Methods

3.1. Data collection

This paper specifically focuses on hotel reviews given that this industry is severely plagued by the problem of fake reviews. In fact, about one in seven reviews for hotels located in popular tourist destinations are estimated to be fake (Carruthers, 2019). Such widespread review fraud stems perhaps from the realization that a 1% increase in hotel review ratings translates to an approximately 2.6% increase in sales per room (Gössling et al., 2018). Moreover, hotel reviews are topical for the post-pandemic world due to what is known as revenge travel—the expected boom in travel and hotel stays over the next few years as it gradually becomes safer (Bologna, 2021).

While cognitive style was measured using a quantitative instrument, a qualitative approach was adopted to explore fake review production strategies. This was necessary

because writing fake reviews is a complex and creative task (Juuti et al., 2018; Wu, 2019) that cannot be explained using any a priori theoretical framework.

Participants were recruited using a combination of purposive and snowball sampling. The inclusion criterion was that they must have had written at least one hotel review in the past year. Three seed contacts consisting of working adults and part-time postgraduate students in a large public university in southeast Asia were purposefully recruited and requested to further disseminate the study invitation among their networks.

The final sample comprised 50 participants ranging in age from 21 to 64 years. Among them were 17 females and 33 males. In terms of race, the majority were Asians, except for two Caucasians and two mixed-race individuals. Eight participants were full-time students (five postgraduate and three undergraduate). Apart from a homemaker, a self-employed professional and a retiree, the remaining participants came from diverse professions including engineers, managers, management executives, pilots, IT consultants, office administrators, real estate agents, and web designers.

Data were collected using online questionnaires that sought both open-ended and close-ended responses. Informed consent was obtained prior to the data collection, which included three steps. First, as recommended by Ott et al. (2011), participants were told to imagine that they had been hired by a marketing agency to write three unique fake reviews—one for each of three randomly selected hotels in Hong Kong, a popular Asian tourist destination. The hotels met the following two criteria: (1) have over 500 online reviews across platforms (e.g., TripAdvisor.com and Booking.com), and (2) their websites must have sufficient information on facilities and location. In this way, participants had ample reference sources to craft realistic fake reviews. In terms of review polarity, participants were randomly and evenly assigned to the conditions of writing consistently in either positive, negative, or neutral tones. This obliviated the need for an individual participant to context-switch in the

task while ensuring that the overall dataset covered the full range of sentiments (Banerjee & Chua, 2017; Luca & Zervas, 2016). As part of the instruction, participants were asked to write each fake review with an intelligible title and a convincing description of at least 30 words.

In the second step, participants answered a series of open-ended questions on how they had composed the fake reviews (Ott et al., 2011; Viviani & Pasi, 2017). If they had relied on any information sources, they were asked to identify them and explain why those sources were consulted. Participants were further asked to elaborate their strategies of writing review titles and review descriptions, including reporting any challenges faced along the way and how those were tackled. They were also encouraged to share any additional details about their experiences of writing fake reviews.

In the third and final step, participants provided their demographic details and responded to Cools and Van den Broeck's (2007) 18-item cognitive style instrument on a 5-point Likert scale: four items for knowing and seven items each for planning and creating. Thus, knowing style scores could range from four (a response of one to all the four items) to 20 (a response of five to all four items). For both planning and creating styles, the scores could range from seven (a response of one to all the seven items) to 35 (a response of five to all seven items).

At the end of the data collection, participants were debriefed. In particular, to allay their ethical concerns about being potentially involved in creating fraudulent entries, they were reassured that their fake reviews would only be used for academic research and their entries would not unfairly advantage or disadvantage any business.

3.2. Data coding and analyses

Fake review production strategies. A grounded theory approach was adopted to explore how people write fake reviews. Allowing room for interpretation and adaptation, its versatility as a method allows researchers to inductively study under-researched topics by uncovering new themes from qualitative data (Charmaz, 2011; Glaser & Strauss, 1967). Such an approach was deemed appropriate because the literature on fake review production strategies is not sufficiently mature to specify a list of pre-set codes.

The coding was jointly done by three research assistants who were trained in qualitative research and had the experience of writing reviews, under the supervision of the authors. A transcript was randomly picked, and the participant's responses were read line-by-line. Every word, sentence, or idea that seemed relevant to fake review production strategies was assigned a descriptive code (King, 2004; Miles et al., 2013; Wu, 2019). It continued until all the transcripts had undergone this procedure. This constitutes open coding, which helps build a preliminary set of insights and develop a bird's eye view of the findings (Glaser & Strauss, 1967; Wolfswinkel et al., 2013). Emergent themes on how participants had gathered information and drafted fake reviews were established. Thereafter, various themes were categorized and compiled chronologically to establish logical connections in the fake review production process. Themes were constantly compared with one another as they evolved (Miles et al., 2013). This constitutes axial coding (King, 2004). Finally, selective coding was employed to integrate and refine the output of the axial coding in order to fit the puzzle at hand and a develop a coherent narrative (Miles et al., 2013; Wolfswinkel et al., 2013). All disagreements in the coding process were resolved through discussion and reaching a consensus among the researchers to confirm the reliability of the coding.

Finally, four stages in the fake review production process and three fake review production strategies were identified. Quotes from the participants were used as evidence to

report these findings. A draft write-up was shared with 20 participants as a form of member checking. No changes to the original interpretation were necessary, thereby ensuring coding validity. These findings are presented in Section 4.

Fake review production strategies as a function of cognitive style. To explore the mapping between fake review production strategies and cognitive style, a hierarchical cluster analysis was conducted on participants' cognitive style scores (Ketchen & Shook, 1996). The mean knowing style score was 16.1 ± 2.45 (Min=8, Max=20), the mean planning style score was 27.2 ± 4.14 (Min=14, Max=35), and the mean creating style score was 26.84 ± 3.6 (Min=15, Max=34). Hierarchical cluster analysis has been used in similar exploratory research; for example, to identify groupings of personality traits encompassing five dimensions: extraversion, agreeableness, openness, conscientiousness, and neuroticism (Zha et al., 2014). Hence, it is likewise used here to group participants into different archetypes of cognitive style based on their scores on knowing, planning, and creating.

Ward's method was leveraged for cluster formation while Euclidean distance was used as the similarity measure (Zha et al., 2014). Bearing in the mind the need for parsimony, a visual inspection of the dendrogram along with an examination of the distance coefficients in the agglomeration schedule suggested a three-cluster solution. As shown in Table 1, the one-way Analysis of Variance (ANOVA) revealed a significant difference across the three clusters in terms of knowing ($F=25.51$; $p<0.001$), planning ($F=14.66$; $p<0.001$), and creating ($F=30.49$; $p<0.001$). Tukey's honestly significant difference (HSD) post-hoc test showed all but one cluster-pair to be significantly different on each dimension of cognitive style. Thus, the three clusters were deemed to be statistically disparate.

[Insert Table 1 about here]

Each cluster was assigned a name based on its cognitive style pattern. Cluster 1 is characterized by a high planning score but moderate knowing and creating scores.

Participants in this cluster are called *planners*, given that planning is their dominant cognitive style. Specifically, they tend to adopt a conventional and systematic approach in processing information and producing coherent arguments. Cluster 2 includes individuals with fairly high scores on all three cognitive style dimensions and are known as *holists* since they are equally adept in all these dimensions. Holists lean on facts and logic and process information systematically but also have an appetite for experimentation. Cluster 3 includes those associated with relatively low levels of each of the three dimensions. They are referred as *laggards* because they do not clearly demonstrate a strong preference for any cognitive style. Having identified the three clusters, the qualitative data were trawled again to examine how participants belonging to each cluster differed in their fake review production strategies. The findings related to cognitive style are presented in Section 5.

4. Findings on Fake Review Production Strategies

The process of writing fake reviews can be mapped into four stages; in chronological order, they are gathering information, assimilating information, drafting the fake review, and finalizing the fake review production. With these stages as the backdrop, three fake review production strategies could be identified, as shown in Figure 1. The first follows all the four stages and is referred as the systematic strategy (22 participants). The second commences with gathering information but skips its assimilation and is called the expedited strategy (four participants). The final starts from the drafting stage and is referred as the direct-drafting strategy (24 participants).

4.1. Stage 1: Gathering information

Existing online reviews. Several participants said that they would read through existing "reviews" (e.g., P2, P15, P40) of not only the hotel in question but also other "hotels

with the same location and class" (P27) to acquire ideas. Agoda.com (P31), Booking.com (P40), Hotels.com (P44), and TripAdvisor.com (P50) were frequently mentioned as useful information sources.

Other online sources. Besides reviews, online information sources such as hotel websites, blogs, discussion forums, and Google Maps were also reviewed. While one participant would consult the "online information on the hotel web page itself" (P3), another would refer to "Google Maps to see the hotel's locality" (P23), and yet another made it a point to look through "photos of the hotel room and facilities" (P36).

Offline sources. Offline information sources were sparingly used. For example, one participant confirmed bouncing off ideas with "friends and family members" (P15) while another gained inspiration "from TV dramas and news" (P47).

4.2. Stage 2: Assimilating information

Consolidating the information. Participants made efforts to consolidate the gathered information, as evident in remarks such as "extract and consolidate info/points and categorize the points" (P2) and "collate the data and string it into a story" (P14). Their intent was to identify patterns and commonalities. For example, one participant disclosed having "read a number of reviews and consolidated the common points and removed isolated cases" (P20) while another "looked out for keywords" (P10) with the purpose of identifying the "common factors mentioned in reviews" (P2). These were often jotted down as "[bullet] points" (P25). A participant writing a positive review elaborated:

> "I will list out all the merits, and filter out the demerits, after which I will organize the information gathered and select a few merits that are being written by other

reviewers so as to reinforce those merits. I will put in one or two more merits of my own, so that it will not look like I just copied from other reviewers" (P15).

Understanding the target hotel. Several participants confirmed that consolidating the gathered information helped them better understand the target hotel, as evident from their desire to "have an understanding of the details of the hotel" (P19), "to have a general idea of the hotel's pros and cons" (P5), and to be aware of the "location and features of the hotel" (P7).

Lending sufficient credence. According to participants, understanding the target hotel is a key step to lend sufficient credence to their fake reviews. Their familiarity with the hotel in question enabled them to "provide valid info" (P16), "to make the review look more genuine even though it is fake" (P30), and "to avoid writing reviews that look fake for inputting wrong information" (P15). One participant affirmed, "[My understanding of the hotel dictated] what kind of thing I should take note of in regard to the review I am going to write" (P14). Another elaborated, "[I] reviewed the hotel website to look at images and hotel facilities to get a better understanding of the hotel. Looked at several reviews, good and bad, on TripAdvisor to look for credible issues raised by other travelers that I could leverage" (P39).

4.3. Stage 3: Drafting the fake review

Rephrasing the gathered information. A few participants appeared to have gathered information but did not invest time and efforts into assimilating it. Instead, they simply copied the content of the information gathered and then started to rephrase the language. This is evident from remarks such as "I copied all the contents of 5–6 reviews and started editing" (P22), and "I did a copy-paste, then I rephrased" (P26).

Rephrasing the assimilated information. Several participants gathered information and assimilated it. Their first draft was built on the consolidated information, followed by editorial amendments. For example, one participant stated, "[I tried to] pick up key points and rewrite in my own words" (P23). Another participant echoed, "I built on my understanding of the hotel's pros and cons" (P6).

Drafting the review title. Participants made efforts to develop review titles that were "striking and attractive" (P12). Some wanted to make the titles "sound cheesy or eye-catching, so that readers want to read further" (P7). While some titles would contain "captivating words like 'great'" (P13), others would include "the selling point that attracted me the most" (P3). Thus, from the drafting stage, participants seemed to be guided by what they thought would draw readers' attention. One participant stated, "[I added] specific words that readers would be interested in. If you can't get them to be interested in your title, it's unlikely you can get them to read your description" (P30).

Drafting the review description. In this step, participants appeared to provide a "convincing and relevant story" (P29) without revealing deception detection cues. For example, one participant who wrote positive reviews indicated, "I emphasized talking about matters that are hardly verifiable or contradicted by existing pictures. Cleanliness, noise [level], and staff friendliness are convenient topics in this regard" (P50). Another participant who wrote negative reviews stated, "[I] described in detail the problems I faced which I felt might be more relevant to future visitors. Tried to reduce the bias of my emotions, be more factually driven and give a complete account of different facets… before passing my judgment at the end" (P49). In writing both positive and negative entries, participants attempted to imbue their reviews with "emotions" (P43) and "personal feelings" (P26).

Participants who were tasked to write neutral reviews stated that they drew on "both positive and negative information about the hotel" (P1). While some participants said that

their neutral fake reviews contained a "similar ratio of praise and criticism" (P9), others expressed middling views without clearly highlighting "any merits and demerits of the hotel" (P11). Based on the responses regarding this step, the task of writing neutral fake reviews seems to be relatively more flexible compared with that of writing either positive or negative entries.

4.4. Stage 4: Finalizing the fake review production

Plagiarism check. Participants recognized the importance of producing fake reviews that are not overly similar to those that already exist on the Internet. They would "rephrase to avoid total similar reviews" (P1) or "reorganize points and input own language/style" (P2). A few participants (e.g., P1, P11) even went to the extent of googling each of their sentences within quotes to find out if similar content existed in any reviews.

Credence check. Participants made it a point to check whether the fake reviews were credible. They would "weave some true experiences with fake claims" (P45), "use simple words because it can be clearly understood" (P19), and "make them sound more down to earth" (P21). To add a personal touch, one participant reported having "added in a [seemingly intuitive] reason for the stay to make them more legitimate" (P21). As a form of final credence check, another participant examined if the reviews were "generic but believable, something that hotels shouldn't be able to claim is completely untrue (e.g., saying that I had something stolen when their records would clearly show no report of a theft)" (P39).

Title-description congruence check. To enhance coherence, several participants attempted to ensure that their review descriptions were "going with the flow" of the review titles (P9). They checked that they created "reviews [descriptions] that expand on the title" (P12) and viewed review descriptions as content that should logically follow from "what I [they] have written as the tittle or subject" (P11).

Cosmetic embellishments. Several participants garnished their fake reviews with paralinguistic features. This is evident from remarks such as "[I] added emoticons to demonstrate my emotions" (P43), "used multiple punctuations to appear more like people using social media" (P19), and "use[d] exclamation marks… to make the review look more expressive" (P3).

4.5. Three fake review production strategies

Systematic strategy. Those who followed the systematic strategy emphasized the importance of gathering and assimilating information so as to compensate for the lack of genuine experiences. This enabled them "to make it [fake reviews] more realistic as I [they] did not experience the hotel personally" (P2), as further echoed in remarks such as "It is difficult to fake it if you don't really know it" (P7), and "The difficulty is in the specifics" (P36). Some participants confirmed that consolidating the gathered information was useful for familiarization purposes, and that a good understanding of the target hotel prepared them to craft convincing fake reviews.

Expedited strategy. The handful of participants who followed this strategy took a cognitive shortcut and skipped the information assimilation stage altogether. They believed in "just doing it spontaneously" (P9) along with "copy-paste" (P26) followed by editorial amendments. One of these participants indicated, "As a person, I found it hard to be mean while writing fake negative reviews in hotels I never stayed in" (P15). Moreover, not being involved in the cognitively-intense task of assimilating the gathered information may have helped the participant maintain a psychological distance from the fake content.

Direct-drafting strategy. The remaining participants who followed the direct-drafting strategy directly started drafting due to two reasons. First, they felt it was easy to imagine circumstances, as reflected in comments such as "It is not hard to fake" (P45), and "Because

of my experiences with hotel service, it's not hard to imagine them [fake reviews]" (P46). In fact, one of them affirmed, "It was fun writing fake reviews. If I were to read my [fake] review, I would have believed [it]" (P37).

Second, these participants were motivated to keep their fake reviews unadulterated. In other words, they were keen "to start on a clean sheet" (P37). One participant explained as follows: "Writing without any sources of information allows me to think without being restricted" (P31). Another added that this approach allowed them to express themselves with a "combination of creativity and personal experience" (P27). Those who followed this strategy appeared confident in their ability to fake based on "imagination" (P31), "past experiences" (P8), and "gut-feeling" (P11).

[Insert Figure 1 about here]

5. Findings on Fake Review Production Strategies as a Function of Cognitive Style

Table 2 shows the mapping of the three fake review production strategies to the three archetypes of cognitive style. Of the 23 planners in the sample, 16 (69.56%) followed the systematic strategy whereas the other seven (30.43%) relied on the direct-drafting strategy. Of the 19 holists, six (31.58%) followed the systematic strategy, two (10.53%) used the expedited strategy, and 11 (57.89%) employed the direct-drafting strategy. Finally, of the eight laggards, two (25%) used the expedited strategy while the remaining six (75%) employed the direct-drafting strategy.

[Insert Table 2 about here]

Planners. The majority of the planners employed the systematic strategy. Given their need for structure and control, they were conscientious about progressing through all four stages of fake review writing. For them, gathering information was necessary "to find relevant information as reference" (P22) and "to have a better understanding of the product

[hotel] before writing" (P8). Information assimilation could not be skipped because this stage allowed them "to get what others feel about the hotel" (P24) and to "differentiate between the negative and positive points" (P8). In terms of the drafting stage, planners would "write in points form and elaborate more when writing" (P25). They would also "reorganize [the] points" (P2) depending on the intended review polarity. When finalizing the fake review production, they ensured that their arguments were "sharp and concise" (P8). They also tried to use attention-grabbing review titles: "The titles must be striking and attractive" (P12).

Holists. The majority of the holists employed the direct-drafting strategy. Given their high knowing style scores, their writing approach showed an inclination toward facts and logic, as best reflected in the following comment: "[I] described more in detail the problems I faced which I felt might be more relevant to future visitors…be more factually driven..." (P49). Next, owing to holists' high planning style scores, they seemed quite methodical in their use of the direct-drafting strategy, as evidenced by remarks such as "I tried to think of some faults, then elaborate how bad they are" (P46) and "[I wrote the] problem first in the heading, but the main content followed the structure of introduction then problem" (P43). Furthermore, their high creating style scores meant that drafting reviews without seeking information was easy for them, as exemplified in comments such as "It's not hard to imagine" (P46) and "Writing without any sources of information allows me to think without being restricted" (P31).

Laggards. Laggards represented the least common archetype of cognitive style. Apparently averse to the systematic strategy, almost all of them embraced the direct-drafting strategy instead. However, unlike planners and holists who were quite methodical, laggards undertook the task of writing fake reviews spontaneously. Ideas were largely drawn from their own personal experiences. Moreover, comments such as "Just relive memories … I would incorporate my travel experience and hotel stay to write fake reviews" (P34), "It was

impromptu" (P35), and "[I] just tried to be frank" (P44) suggest little evidence of careful planning. Nonetheless, before finalizing their fake reviews, they still ensured that the entries were "credible" (P17), review descriptions "flow[ed logically]" with the review titles (P9), "looked professional" (P34), and paralinguistic features such as punctuations and emoticons were added "to make it more interesting" (P9).

Additional analysis of the review content. Prior research shows that fake reviews typically contain exclamation marks and affective words (Banerjee & Chua, 2017; Ott et al., 2011). Hence, to explore how the cognitive style interacts with writing fake reviews of different polarities, the content of the entries was analyzed using a series of 3 (review polarity: positive, negative, neutral) x 3 (cognitive style archetypes: planner, holist, laggard) factorial ANOVA. For a more granular analysis, the fake reviews were broken down into titles and descriptions (De Ascaniis & Gretzel, 2012). The occurrences of exclamation marks and affective words were calculated using the linguistic inquiry and word count algorithm (Pennebaker et al., 2007) and were expressed as average percentages across the three reviews each participant wrote. Percentages rather than absolute counts were used to account for the different content lengths.

The factorial ANOVA with the percentage of exclamation marks in review descriptions as the dependent variable detected a significant main effect of review polarity ($F(2,44)=5.35$, $p=0.008$, partial $\eta^2=0.196$). The main effect of cognitive style and the interaction effect were statistically non-significant. The post-hoc analysis confirmed that regardless of cognitive style archetype, exclamations were significantly more prevalent in descriptions of neutral reviews (1.42±2.03) compared with either positive (0.27±0.6) or negative (0.06±0.16) entries. The usage of exclamations in neutral reviews is reflected in the following review description: "… the cleaner wasn't pleased that I requested the bathroom to

be cleaned! What?! …perfect for tourist who are here for shopping and sightseeing! The train station is just a few minutes away and they have great service!"

The factorial ANOVA with the percentage of affective words in review descriptions as the dependent variable also revealed a significant main effect of review polarity ($F(2,44)=4.76$, $p=0.013$, partial $\eta^2=0.178$). The main effect of cognitive style and the interaction effect remained statistically non-significant. The post-hoc analysis revealed that affective words were significantly more prevalent in descriptions of neutral (7.85±2.08) and negative (7.37±4.07) reviews compared with positive entries (5.04±2.41). Negative affective words such as "awful," "bad," "disappointment," and "useless" appeared in negative reviews. Neutral reviews included not only negative words but also positive words such as "easily," "good," "great," and "nice." This lends further support to the pattern identified earlier that writing neutral fake reviews offers greater flexibility and room to maneuver vis-à-vis either positive or negative entries (cf. Section 4.3).

Overall, the ANOVA results suggest that irrespective of the cognitive style archetype, neutral entries resembled typical fake reviews more closely compared with positive and negative entries (Banerjee & Chua, 2017; Ott et al., 2011). Positive fake reviews, however, bore the least resemblance to typical fake reviews as they were not rich in exclamations or affective words. In other words, neutral fake reviews seem easily identifiable using detection algorithms, whereas positive fake reviews are likely to slip through the cracks. In addition, the ANOVA results highlight that individuals with different cognitive style could write fake reviews in unpredictable ways despite using different production strategies. This explains why detection algorithms have often been found wanting in the face of human-generated fake reviews (Luca & Zervas, 2016; Reyes-Menendez et al., 2019).

6. Discussion

Three key findings gleaned from this paper are worth discussing in light of the literature. First, an attractive review title followed by a credible review description was usually seen as the template for a compelling fake review. Participants were mindful of credence throughout the writing process. Employing online resources, they looked for information about the target hotels to make their fake reviews credible. They also occasionally let their imaginations run wild by drawing on unpredictable information sources such as "TV dramas" (P47). Hence, it is no wonder that the literature holds the currently available algorithms for detecting fake reviews to be largely ineffective (Luca & Zervas, 2016; Reyes-Menendez et al., 2019). Participants also attempted to make their titles attractive. This corroborates previous research that found detection cues to be leaked from review titles (Banerjee & Chua, 2017; De Ascaniis & Gretzel, 2012).

Second, few participants deemed the task of writing fake reviews challenging. This contradicts the literature that has generally suggested lying to be difficult (Hartwig et al., 2011; Tausczik & Pennebaker, 2010). A possible explanation is that the act of lying is perceived to be depersonalized in the online environment. Fake review writers often consider themselves detached from their potential readers. After all, the further a liar is away from the target audience, the more comfortable it is for him or her to lie (Hancock et al., 2004).

A few of the comments proved to be deeply insightful. To maintain a psychological distance between themselves and their readers (Banerjee et al., 2017; Hartwig et al., 2011; Tausczik & Pennebaker, 2010), participants either avoided personal pronouns such as "I" or used collective pronouns such as "we." For example, one participant indicated, "I used a third person approach while writing the fake reviews to sound objective" (P35). Another explicitly stated, "[I] avoided using personal pronouns" (P5). A couple of participants said that they would use collective pronouns to "sound realistic" (P3) but sub-consciously almost as if to

share the accountability of faking with imaginary others: “I used ‘we’ as I’m writing on the assumption that I stayed in the hotel with my family” (P2).

A handful of participants found the task of writing negative reviews to be particularly difficult. One such participant explained, “As a person, I found it hard to be mean while writing fake negative reviews in hotels I never stayed in” (P15). Another questioned, “Why am I badmouthing other hotels?” (P48). These could be vestige of the pangs of conscience that one is likely to experience while writing fake reviews (Banerjee et al., 2017; Tausczik & Pennebaker, 2010). Moreover, their psychological state could have resulted in the use of numerous affective words in the descriptions of negative reviews (7.37±4.07).

The third finding is that cognitive style shaped the fake review production strategy. This confirms its relevance in information processing behaviors, as highlighted in the literature (Cools & Van den Broeck, 2007; Cools et al., 2012; De Stobbeleir et al., 2011; Hodgkinson & Sadler-Smith, 2003). Based on the cognitive style literature, the tentative expectation was that pure knowers would invest efforts in information-seeking tasks, pure planners would stick to a methodical course of action, and pure creators would utilize their creativity to conjure up scenarios when writing bogus entries. In reality, however, pure knowers, pure planners, and pure creators seem to be far and few between. Using clustering, this paper identified three archetypes of cognitive style, namely, planners, holists, and laggards.

Planners were indeed methodical in their approach to fake review production, largely following the systematic strategy. In contrast, both holists and laggards were found to widely employ the direct-drafting strategy: the former was keen to leverage their creative juices while the latter was eager to simplify the task at hand and did not appear to be overly conscientious. Planners, holists, and laggards were similar in the sense that they all injected

affective words and exclamations into their fake reviews. However, while planners always avoided the expedited strategy, laggards were never keen to follow the systematic strategy.

According to the ANOVA results, the main effect of cognitive style archetypes never emerged as being significant in the production of typical fake reviews. In other words, individuals with different cognitive styles seem equally capable of writing fake reviews in unpredictable ways but utilize different fake review production strategies. This possibly also explains why fake review detection algorithms are not yet sufficiently effective (Luca & Zervas, 2016; Reyes-Menendez et al., 2019). Moreover, it suggests that human-generated fake reviews are still more difficult to detect than those that are products of NLG.

7. Conclusion

This paper investigates how fake reviews are written as a function of individuals' cognitive style. While cognitive style was measured using a quantitative scale, a qualitative approach was adopted to explore fake review production strategies. Based on the data collected from 50 participants, writing fake reviews was found to involve four stages: gathering information, assimilating information, drafting the fake review, and finalizing the fake review production. Three major fake review production strategies were identified: systematic, expedited, and direct-drafting. Three archetypes of cognitive style were also identified: planners, holists, and laggards. The systematic strategy was mostly followed by planners, while the direct-drafting strategy was widely employed by both holists and laggards. These are completely new insights that extend the scholarly understanding of online fake review writing.

7.1. Limitations and future research directions

The findings of the paper should be viewed in light of two limitations. First, this research used only hotel reviews as the context of investigation. Second, the study was conducted in Asia. Most of the participants were Asians, who were asked to write fake reviews for hotels in Hong Kong—a popular Asian tourist destination. Thus, the generalizability of the findings is limited by the boundary conditions of fake reviews for well-known hotels in Asia written predominantly by Asians. Interested scholars could replicate the current study in an occidental setting focusing on reviews for other products and services. Such studies will enhance the scholarly understanding of the kinds of markets and scenarios that make writing fake reviews easier than others.

The paper also opens several avenues for further research. One option is to carry out a similar study with professional content writers, whose writing style would presumably be more sophisticated than regular Internet users. Another interesting research direction lies in investigating how the review submission interface affects review writing strategies. Moreover, since cognitive style emerged as an insightful lens for studying how reviews are written, future research could investigate how knowing, planning, and creating scores correlate with the ways in which reviews are read and processed prior to making purchase decisions. Attention could also be focused on how cognitive style is brought to bear on individuals' ability to detect fake reviews.

7.2. Theoretical contributions

The paper makes four theoretical contributions. First, it initiates a new line of academic discourse in the realm of fake reviews. Prior research has examined the motivations for writing authentic reviews (Cheung & Lee, 2012; Hennig-Thurau & Walsh, 2003; Mathwick & Mosteller, 2017), how authentic reviews are written (Forman et al., 2008;

Stoddard et al., 2016; Zhu et al., 2020), and factors that prompt fake reviews (Thakur et al., 2018). Extending the literature, this paper responds to the recent call for research (Sahut et al., 2021; Wu et al., 2020) by focusing on how people write fake reviews. Three specific strategies were identified: systematic, expedited, and direct-drafting. The systematic strategy involves a combination of skills ranging from information seeking and assimilation to linguistic competency and creativity. While the expedited strategy does away with information assimilation, the direct-drafting strategy only requires linguistic competency and creativity.

Second, the paper not only shows a taxonomy of fake review production strategies but also explains why people select certain strategies. It is the first work to apply the idea of cognitive style (Cools & Van den Broeck, 2007) to the context of fake review writing, a cognitively challenging task (Hancock et al., 2004; Hartwig et al., 2011; Juuti et al., 2018; Plotkina et al., 2020; Tausczik & Pennebaker, 2010). The majority of the planners were found to follow the systematic strategy of writing fake reviews due to their need for structure and control. Most of the holists employed the direct-drafting strategy but were fact-driven, methodical, and creative as a result of their high knowing, planning, and creating style scores, respectively. Lacking a strong preference for any cognitive style, laggards mostly embraced the direct-drafting strategy spontaneously.

Third, the paper enriches the literature by uncovering a number of new insights (cf. Section 6). Fake reviews are generally known to exaggerate with exclamations and affective words (Banerjee & Chua, 2017; Ott et al., 2011). Examining these cues in fake reviews more granularly, it was found that exclamations tend to be used in neutral reviews while affective words were prevalent in negative and neutral reviews. Both cues, however, were not observable in positive reviews. In fact, human-generated fake reviews do not always conform to the styles and characteristics of phony entries as suggested in the literature. In addition,

planners and holists were anticipated to produce more sophisticated fake reviews vis-à-vis laggards, yet no particular cognitive style was found inferior to another in producing compelling and unpredictable fake reviews. This explains why it is far more difficult for detection algorithms to deal with fake reviews created manually than those templated using NLG (Luca & Zervas, 2016; Reyes-Menendez et al., 2019; Yao et al., 2017).

Finally, dovetailing the cognitive style literature (Cools & Van den Broeck, 2007, 2008; De Stobbeleir et al., 2011; Hodgkinson & Sadler-Smith, 2003), the findings indicate that few people in reality are pure knowers, planners, and/or creators—that is, scoring high in just one of the three cognitive style dimensions and low in the other two. On the contrary, most people exhibit a preference for a combination of knowing, planning, and creating styles. Future research that seeks to map cognitive style with information processing and/or consumer behaviors could leverage cluster analysis to make sense of the data.

7.3. Practical implications

On the practical front, the paper has implications for algorithm developers, review readers, website designers, and brand managers. To begin with, the paper shows that unlike negative and neutral fake reviews that could be exaggerated with affective words in descriptions, positive fake reviews may not necessarily express substantial emotions. Hence, detection algorithms need to be fine-tuned based on the polarity of the incoming reviews. Moreover, the paper identified three fake review production strategies—systematic, expedited, and direct-drafting—that possess differing levels of sophistication. The simplest approach to weed out fake reviews is to tackle those created using the expedited and the direct-drafting strategies. As such entries tend to miss out on understanding the target hotel and lack sufficient credence, automated detection algorithms could check for these omissions.

For review readers, this paper highlights the presence of affective words in the text as a potential red flag. In particular, a damning review containing excessive negative affective words is likely to be bogus. Unfortunately, positive fake entries may not be so easily identified. The advice is, therefore, to take reviews from any given website with a pinch of salt and to gather more information from multiple sources whenever possible.

The paper also reveals that some fake review writers were plagued by their own conscience. In this vein, website designers could design the interface of review submission systems in ways to appeal to the contributor's moral obligation to be truthful. Additionally, since fake reviews are often written based on existing reviews, text selection should be disabled to prevent the content of the entries from being copied and pasted. In addition, it might be worthwhile to consider running a plagiarism check on every incoming review and displaying the similarity percentage alongside it. Off-the-shelf plagiarism detection software has already been shown to work well in identifying near-duplicate reviews (Ott et al., 2011). Every effort to exact a cost for posting fake reviews would go some way to yield a deterrent effect and promote trust in the website.

For their part, brand managers could collaborate with their technical colleagues to continuously monitor their brands' online reputation and promptly respond to potential review fraud attacks, including employing legal means against bad actors. For example, Amazon has pursued legal actions against four companies accused of inundating its platform with fake reviews, which has subsequently prevented millions of fictitious reviews from being published (Kleinman, 2022).

The prevalence of fake reviews is problematic for online marketplaces in the long run as it erodes consumer trust. Thus, it is hoped that the awareness raised by this paper, as part of the Journal of Business Research's special issue on fake reviews (Sahut et al., 2021), will play a role in discouraging such malpractice.

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Table 1: Cognitive style patterns in the three clusters.

Clusters	**Knowing** (F=25.51; p<0.001)	**Planning** (F=14.66; p<0.001)	**Creating** (F=30.49; p<0.001)
Planners (N = 23)	Moderate (15.78 ± 1.68) • Vs. Holists: p<0.01 • Vs. Laggards: p<0.001	High (28.39 ± 2.52) • Vs. Holists: non-sig. • Vs. Laggards: p<0.001	Moderate (25.87 ± 2.22) • Vs. Holists: p<0.001 • Vs. Laggards: p<0.01
Holists (N = 19)	High (17.89 ± 1.52) • Vs. Laggards: p<0.001	High (28.21 ± 4.04) • Vs. Laggards: p<0.001	High (29.89 ± 2.18) • Vs. Laggards: p<0.001
Laggards (N = 8)	Low (12.75 ± 2.32)	Low (21.38 ± 3.50)	Low (22.38 ± 3.42)

Note. Bullet points represent the results of Tukey's HSD post-hoc test.

Table 2: Mapping fake review production strategies with archetypes of cognitive style.

Strategy	**Archetypes of Cognitive Style**			
	Planners N (%)	**Holists N (%)**	**Laggards N (%)**	**Total**
Systematic strategy	16 (69.56%)	6 (31.58%)	0	**22**
Expedited strategy	0	2 (10.53%)	2 (25%)	**4**
Direct-drafting strategy	7 (30.43%)	11 (57.89%)	6 (75%)	**24**
Total	**23 (100%)**	**19 (100%)**	**8 (100%)**	**50**

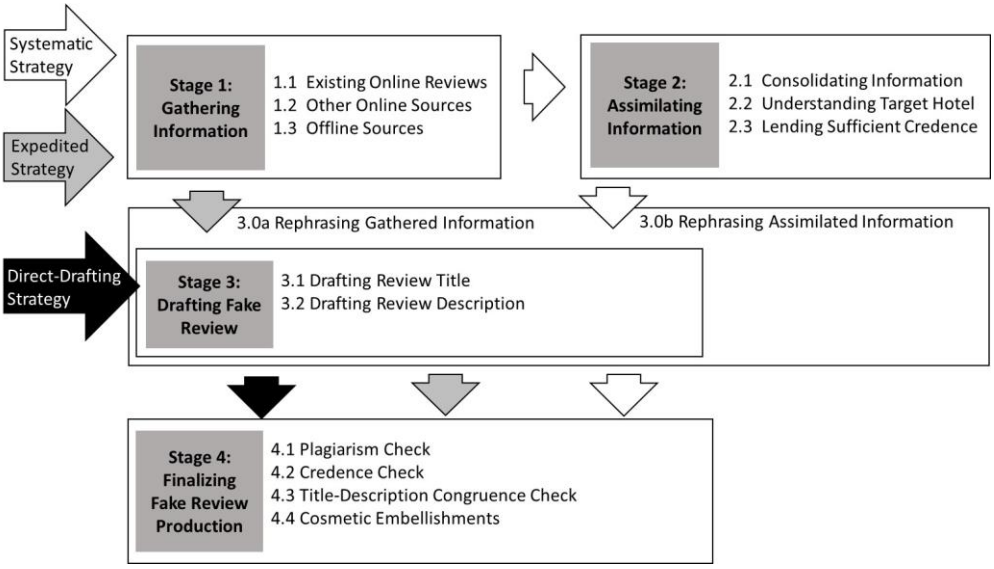

Figure 1: Fake review production stages and strategies.