THE WRAP EFFECT IN ONLINE REVIEW SETS REVISITED: HOW PERCEIVED USEFULNESS MEDIATES THE EFFECT ON INTENTION FORMATION

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ABSTRACT

We investigate the effect of primacy-recency reinforcement (wrap), i.e. when the first and last review of a set have the same valence, on the behavioral intentions (purchase and recommendation intention) of review readers. In addition, we study how this effect is mediated by the perceived usefulness of the reviews. The results of a 2 (Valence of first review: positive, negative) x 6 (Review sequence) full factorial between-subjects experiment (n = 552) confirm that wrap effects bias intentions. A positively wrapped review set leads to a higher purchase and recommendation intention than a non-wrapped review set with a positive first review. Conversely, a negatively wrapped review set leads to lower intentions than a non-wrapped review set with a negative first review. In case of a negative wrap, this relationship is mediated by the perceived usefulness of the reviews such that a negative wrap increases the perceived usefulness of the review set which, in turn, affects intentions. In case of a positive wrap, the positive relationship between wrap and intentions is direct and not mediated by perceived usefulness.

Keywords: Online reviews; Valence; Sequence; Wrap effect; Perceived usefulness; Behavioral intentions.

1. Introduction

Online reviews are information posted by existing consumers about their consumed products or services on e-commerce or third party websites (e.g., Amazon.com, Yelp, TripAdvisor) [Zhu et al. 2014]. Studies indicate that 78% of consumers consider online reviews before making a purchase, while 44% post reviews themselves [eMarketer 2013]. Compared to advertising, reviews are more likely seen by prospective customers as trustworthy and credible [Chih et al. 2013], as they do not trigger persuasion knowledge (i.e., the attitude bias that results from the awareness of a persuasion attempt) [Friestad & Wright 1994; Purnawirawan et al. 2012]. Electronic word-of-mouth (eWOM) is any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet [Hennig-Thurau et al. 2004]. eWOM can be spread, for example, through brand communities (e.g., Apple, Lego), professional (LinkedIn) and non-professional

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networking sites (Facebook), consumers' review websites (e.g., TripAdvisor, Cnet) and (micro) blog sites (Twitter). Although the importance of eWOM in consumer behavior has been studied extensively [Cheung & Thadani 2012; Doh & Hwang 2009; Park & Lee 2009], there is little understanding of how the mix of positive and negative reviews in an online review set affects attitude formation and behavioral intentions.

In the academic literature on electronic word of mouth, there are only a few studies that have investigated the impact of a set of reviews instead of a single review. Additionally, the few studies on the impact of the balance (the degree of positivity or negativity) of a set of reviews have often assumed that people form impressions and attitudes on the basis of an accurate assessment of a positively, a neutrally and a negatively balanced set, but have ignored the effect of review sequence [Doh & Hwang 2009; Lee et al. 2008]. The current study builds on the research of Purnawirawan et al. [2012] who introduced the concept of the "wrap effect" (or the primacy-recency reinforcement effect) in online review sets. Wrapping occurs when the first and the last review in a set are of the same valence. Specifically, they showed that, for a neutrally balanced review set (containing an equal number of positive and negative reviews), when the first and last review in the set are both positive (positive wrap), readers' recall and impression about the reviews is positively biased, compared to when they were exposed to a non-wrapped review set. Conversely, when the first and last review are both negative (negative wrap), impressions are biased negatively. In a second study [Purnawirawan et al. 2012b], they also found that both positive and negative wrapping can increase the perceived usefulness of a review set. Purnawirawan et al. [2012, 2012b] thus demonstrated that a mix of positive and negative online reviews triggers cognitive biases, depending upon the order in which these reviews are read. More specifically, "wrapping" is important: wrapped review sets have a different effect on readers' responses than non-wrapped review sets.

The focus of the Purnawirawan et al. [2012] study was to use the wrap effect to predict review impression and the attitude towards a service (a hotel). The first contribution of the present study is that it extends the findings of Purnawirawan et al. [2012] to behavioral intentions, i.e. the intention to perform a certain behavior, more specifically purchase intention and intention to recommend the reviewed service, and provides insight into the mediating role of perceived usefulness in this process. Second, in both studies by Purnawirawan et al. [2012, b], the number of reviews read was kept constant for reasons of internal validity. In the present study, we enhance the external validity of the research by leaving respondents free to read as many reviews as they want. As such, the article represents a test under more ecologically valid circumstances of the robustness of the wrap effect, through perceived usefulness, on behavioral intentions.

2. Literature review

2.1. The impact of the wrap effect on behavioral intentions

Potential buyers of a product or service are likely to encounter a plethora of online reviews. According to cognitive load theory, people cannot process all available information in a short period of time due to limited cognitive capacity [Sweller 1988]. As a result, consumers use heuristics or 'shortcuts' to form an opinion. For instance, the sequence in which reviews are read affects readers' attitudes and intentions. Primacy and recency are two well-known sequence effects. The first review in a set is more influential than the rest of the set (primacy effect) as the cognitive capacity of the short-term memory at the beginning of the set is still unburdened [Li 2009]. In contrast, the recency effect is the tendency to take into account the last item in a list as it is the last entry in memory and therefore easiest to retrieve [Cohen 1981].

The wrap effect, or the primacy-recency reinforcement of two reviews of the same valence, is based on a combination of the two effects , i.e., the tendency to consider the first and the last review more than other entries in between [Craik & Lockhart 1972; Murphy et al. 2006]. The valence of the first review plays a crucial role as an "anchor", a reference point or primary idea about whether the target object can be categorized as good or bad [Furnham & Boo 2011; Northcraft & Neale 1987; Purnawirawan et al. 2012]. When the last review of a set is of the same valence as the first one, this reinforces the initial impression. The other reviews in between are less influential. The first and the last review people read bias readers' evaluations, causing a positive (first and last review are both positive) or negative (first and last review are both negative) wrap effect [Purnawirawan et al. 2012].

Reviews, and more specifically the wrap effect in review sets, can have an impact on various responses by the readers of the reviews, both evaluative response and intentions. Purnawirawan et al. [2012] focused on evaluative outcomes (review impression and attitude). In the present study, we extend these findings by focusing on behavioral intentions (purchase and recommendation intention). We propose effects on behavioral intention variables, on top of effects on evaluative outcomes, based on the traditional hierarchy-of-effects principle: advertising messages or reviews lead to behavioral (intention) outcomes through the effect they have on intermediary evaluative brand responses of consumers [Barry 1987; 2002; Barry & Howard 1990; Gordon & Anand 2000]. It is therefore reasonable to expect that, if evaluative effects of wrapped review sets have been found, this will also show in behavioral intention

outcomes. Furthermore, research has shown that eWOM play a substantial role in shaping people's attitudes as well as their behavior [e.g., Bickart & Schindler 2001; Trusov et al. 2009].

In their research, Purnawirawan et al. [2012] only found a significant wrap effect on review impression in neutrally balanced review sets (i.e., sets where the number of positive and the number of negative reviews are equal). In the current study, we take the impact of balance into account by controlling for the number of positive and negative reviews read. Based on primacy-recency reinforcement, we hypothesize:

H1*: Controlling for the number of positive and negative reviews read:*

a) for a review set with a positive first review, positive wrap (when the last review read is also positive) will lead to more favorable purchase and recommendation intentions than no wrap.

b) for a review set with a negative first review, negative wrap (when the last review read is also negative) will lead to less favorable purchase and recommendation intentions than no wrap.

2.2. The mediating effect of the perceived review usefulness

In line with the primacy-recency reinforcement principle, wrapping can reinforce the perceived usefulness of a review set. As mentioned, the valence of the first review plays an anchoring role in establishing a primary diagnosis about the quality of the reviewed object. This diagnosis influences the encoding and retrieval of subsequent information. Information that confirms the initial diagnosis is more likely considered useful, while information that disconfirms the initial diagnosis is often discounted. When the closing review repeats the evaluation of the first reviews in term of valence, this last review serves as a confirmation and reinforcement of the initial judgment. This provides readers with a sense of certainty, which will reflect in a higher perceived usefulness of the review set. When the reviews do not have a wrapped sequence, i.e. the last review disconfirms the initial position, readers will experience confusion about whether their initial diagnosis was correct, and the review set will be perceived as less useful. Purnawirawan et al. [2012] also evidenced that wrapping can increase the perceived usefulness of a review set, but only when the set contains a clear majority opinion. Because we control for the number of positive and negative reviews read in the present study, it represents a stricter test of the effect of wrapping on perceived usefulness.

Consumers read online reviews to reduce purchase risk. However, information overload can occur with an increasing number of online reviews. When readers are able to identify the useful reviews, this can reduce information overload [Baek et al. 2015]. Wan & Nakayama [2014], for example, argue that helpfulness votes are important to help consumers in product research and making purchase decisions. As proposed by accessibility-diagnosticity theory [Ahluwalia & Gürhan-Canli 2000], information is only likely used as an input for judgment when it is both accessible in memory and diagnostic for the judgment [Feldman & Lynch 1988]. Therefore, more diagnostic (useful) online reviews have a stronger influence on intentions [Mudambi & Schuff 2010; Purnawirawan et al. 2015]. Baek et al. [2015] showed that reviews that are considered as more useful indeed more strongly determine product revenue. Obviously, with positive wrapping, the net effect should be positive, while negative wrapping should decrease behavioral intentions:

H2*: The impact of the wrap effect on readers' purchase and recommendation intention is mediated by perceived usefulness, such that a wrapped review set leads to a greater perceived usefulness than no wrap, and a greater perceived usefulness leads to more (in case of positive wrap) or less (in case of negative wrap) favorable purchase and recommendation intentions.*

3. Method

3.1. Pretests: Selection of review elements

We conducted three pretests to ensure equivalence of the reviews in the set, in a similar fashion as Purnawirawan et al. [2012]. We used a vacation context and collected 48 hotel quality elements through a content analysis of review websites. Respondents (n = 31) were asked to rate the importance of each of these hotel quality elements on a 7-point Likert scale. The 24 most important elements were incorporated into 12 positive reviews (each review contained two elements to mimic realistic views). Respondents in a second pretest (n = 33) were then asked to rate how important these reviews were for them on a 7-point Likert scale. A repeated measures ANOVA confirmed that the 12 reviews were all perceived as equally important ($p = .342$). The reviews were then formulated inversely to generate identical reviews with a negative valence, for instance: "The hotel food was very good and we got a big room" vs. "The hotel food was not good and our room was rather small" or "The food was very varied, there is a different buffet every day. The hotel is also close to the beach" vs. "The food was pretty much the same every day, not much variation. The hotel is also far from the beach".

In the third pretest (n = 22), respondents were asked to rate the valence of each review on a 7-point semantic differential ("To what extent do you find this review negative/positive?"). A repeated measure ANOVA confirmed that the 12 positive reviews were perceived as equally positive, and so were the negative reviews ($p > .636$). This resulted in 24 equivalent final reviews (12 positive reviews and their negative counterparts) for use in the main study.

3.2. Design and Participants

The main experiment consists of a 2 (Begin valence: positive, negative) x 6 (Sequence of reviews) full factorial between-subjects design (Table 1). We composed 12 sets of reviews, each containing 6 positive and 6 negative different reviews from the pretest. We chose to present a total of 12 reviews to all respondents, because prior research indicates that over 90% of people read five to ten reviews per search session [Purnawirawan et al. 2012]. By offering more than 10 reviews, we avoid that all respondents would read all possible reviews. Note that, a priori, the review sets are all equally balanced, but because respondents could stop reading at any time, the actual balance will differ. Half of the review sets started with a positive review, while the other half started with a negative review. The reviews were then offered in 6 different sequences to neutralize sequence effects [Purnawirawan et al. 2012].

Respondents were recruited by a professional market research agency. They were reached via e-mail containing a link to the online survey. Data of 678 respondents (average age = 46 years, 43.6% male) were collected. Respondents were instructed to imagine that they were booking a hotel in Tenerife (Spain). Having read this scenario, each respondent was randomly assigned to one of the 12 conditions. Respondents could read a maximum of 12 reviews, each presented on a separate page. After each review, respondents had to choose whether they wanted to read another review, or whether they felt they had enough information about the hotel to stop reading reviews. Respondents could indeed choose the number of reviews they wanted to read, instead of imposing a fixed number of reviews to be read, as the latter was the case in the Purnawirawan et al. [2012, b] articles. This was done for reasons of ecological validity: in reality, people also read as few or as many reviews they want. The average number of reviews read was 5.80, and the standard deviation of this mean was 4.109. Consequently, there is a large variation in the number of reviews read, and the current study is thus, in that respect, fundamentally different from the Purnawirawan et al. [12] study. 18.6% of the participants only read one review. Investigating primacy-recency reinforcement is meaningless if only one review is read. Therefore, we removed these participants from the analyses.

Table 1: Overview of the 2 (Valence of first review: positive, negative) x 6 (Sequence of reviews) between-subjects design

Positive first review

Review set	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
1	+	-	+	-	+	-	+	-	+	-	+	-
2	+	+	-	-	+	+	-	-	+	+	-	-
3	+	+	+	-	-	-	+	+	+	-	-	-
4	+	+	+	+	-	-	-	-	+	+	-	-
5	+	+	+	+	+	-	-	-	-	-	+	-
6	+	+	+	+	+	+	-	-	-	-	-	-

Negative first review

Review set	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
7	-	+	-	+	-	+	-	+	-	+	-	+
8	-	-	+	+	-	-	+	+	-	-	+	+
9	-	-	-	+	+	+	-	-	-	+	+	+
10	-	-	-	-	+	+	+	+	-	-	+	+
11	-	-	-	-	-	+	+	+	+	+	-	+
12	-	-	-	-	-	-	+	+	+	+	+	+

Note: "+" stands for a review with a positive valence; "-" stands for a review with a negative valence.

The number of positive and negative reviews read and the valence of the last review read were recorded for further use in the analysis. Based on the valence of the first and the last review actually read, we constructed the variable 'wrap factor' with 2 levels: when the valence of the last review actually read was different from the valence of the first review, this was coded as 0 (No wrap), whereas when the first and last review were of the same valence (either both positive or both negative), this was coded as 1 (Wrap).

3.3. Measures

After reading the reviews, respondents were asked to rate the perceived usefulness (PU) [Purnawirawan et al. 2012] of the reviews they read, their intention to stay at the hotel (purchase intention - PI) [Netemeyer et al. 2005] and

their intention to recommend it (recommendation intention - RI) [Arnett et al. 2003] on 7-point scales (see Table 2). Scores on the individual items per construct were then averaged to compute the construct scores.

Table 2: Construct items

Construct	Items	Cronbach's α
Perceived Usefulness (PU)	- I found the reviews useful. - The reviews helped me to shape my attitude toward the hotel. - The reviews helped me to make a decision regarding this hotel.	.901
Purchase Intention (PI)	- It is very likely that I will stay at this hotel. - I will certainly try this hotel. - There is a great chance that I will choose this hotel.	.986
Recommendation Intention (RI)	- I will speak favorably about the hotel. - I will recommend the hotel to my family and friends. - I will bring up the hotel in a positive way in conversations I have with family and friends.	.935

4. Results

To test the first hypothesis, we ran a MANCOVA with PI and RI as dependents. Table 3 provides the sample size, means and standard deviations per cell. The valence of the first review (positive vs. negative), the wrap factor (wrap vs. no wrap) and their interaction served as independents, with the number of positive reviews read (Mpos = 3.47) and the number of negative reviews read (Mneg = 3.41) as covariates. The number of positive reviews read has a significant positive effect ($p < .001$), while the number of negative reviews read has a significant negative effect ($p < .001$). The effect of the begin valence was not significant ($p = .268$) and the effect of the wrap factor was found to be significant ($p = .041$).

More importantly, the interaction between the valence of the first review and the wrap factor is significant ($p < .001$). Univariate simple effects tests show that a positively wrapped review set leads to a higher PI ($M = 4.69$) and RI ($M = 4.63$) than a non-wrapped review set with a positive first review (PI: $M = 3.25$, $p < .001$; RI: $M = 3.29$, $p < .001$). This confirms H1a. A negatively wrapped review set leads to a lower PI ($M = 2.10$) and RI ($M = 2.60$) than a non-wrapped review set with a negative first review (PI: $M = 3.61$, $p = .001$; RI: $M = 3.65$, $p = .019$) (Figure 1). H1b is thus also confirmed.

Table 3: Sample size, means and standard deviations for purchase intention (PI) and recommendation intention (RI)

Wrap factor	*No Wrap*			*Wrap*		
Valence of first review	*Positive* (n = 209)	*Negative* (n = 97)	*Total* (n = 306)	*Positive* (n = 104)	*Negative* (n = 142)	*Total* (n = 246)
PI	3.25	3.61	3.36	4.69	2.10	3.19
	(1.57)	(1.18)	(1.47)	(1.67)	(1.22)	(1.91)
RI	3.29	3.65	3.40	4.63	2.60	3.46
	(1.15)	(1.08)	(1.14)	(1.21)	(1.06)	(1.51)

Note: standard deviations between brackets below the mean.

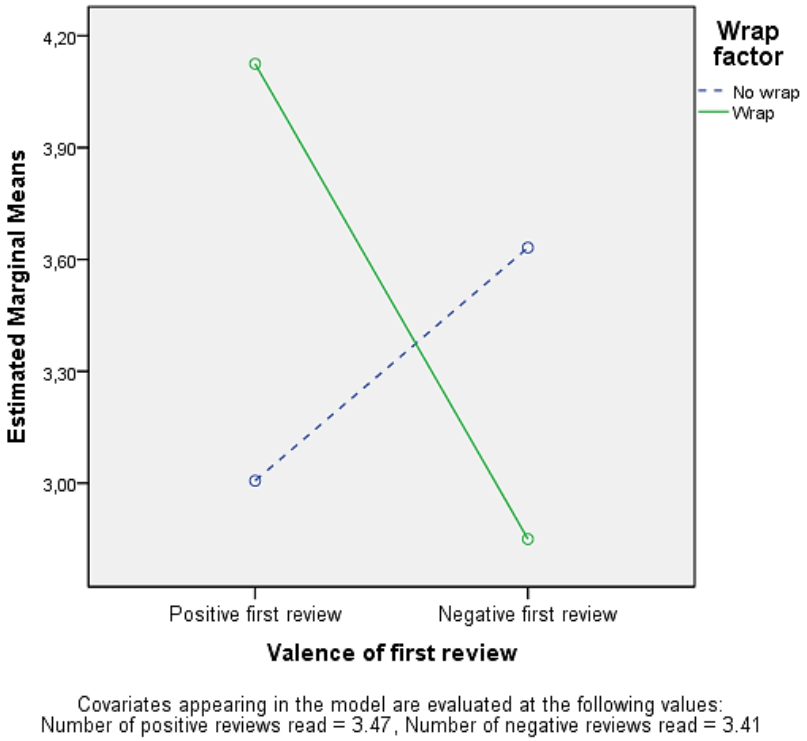

Figure 1: The impact of wrap on purchase intention (PI)

The mediation analyses to test H2 were conducted separately for review sets with a positive and negative begin valence, using Model 4 of Hayes' Process macro [Hayes 2013]. The impact of the wrap factor on PI and RI was tested with perceived usefulness (PU) as the mediator. The number of positive reviews read and the number of negative reviews read were again entered as covariates. For the review sets which started with a positive review, the wrap factor exerts a significant positive effect on PU ($b = .329$, $p = .034$). However, the impact of PU on PI ($b = .027$, $p = .700$) and RI ($b = .069$, $p = .161$) is insignificant. As a result, the indirect effect of the wrap factor on PI and RI through PU is not significant (the 95% confidence intervals contain zero). The direct effect of a positive wrap on PI ($b = 1.122$, $p < .001$) as well as RI ($b = 1.056$, $p < .001$) is positive and significant. This means that positive wrapping works direct-only, and its effect is not mediated. For review sets with a negative begin valence, the impact of the wrap factor on PU is positive and significant ($b = .859$, $p < .001$). PU, in turn, has a (marginally) significantly negative impact on PI ($b = -.263$, $p < .001$) and RI ($b = -.097$, $p = .058$). Additionally, the direct effect of the wrap factor on PI ($b = -.925$, $p < .001$) as well as RI ($b = -.655$, $p = .022$) is negative and significant. The relationship between negative wrapping and behavioral intentions is thus complementarily mediated by the perceived usefulness of the reviews. These findings partly support H2.

5. Discussion and conclusion

5.1. Academic implications

The current study offers a number of academic insights. The results corroborate the existence of a wrap effect, and show that, when controlling for the number of positive and negative reviews people read, and allowing people to read the number of reviews they wish, wrapping influences behavioral intentions in the direction of the valence of the first and last review read. When the first and the last review people read is positive (positive wrap), readers are more likely to book the hotel and recommend it than when the first review is positive and the last one is negative. Similarly, when a set of reviews starts with a negative review, readers are less likely to book the hotel when the last review is also negative (negative wrap) than when the reviews are not wrapped (and so the last review is positive). These findings are in line with the primacy-recency reinforcement and extends the wrap effect on impressions found in prior research to behavioral intentions [Purnawirawan et al. 2012].

In line with the accessibility-diagnosticity principle [Herr et al. 1991], perceived review set usefulness complimentarily mediates the relationship between the wrap factor and behavioral intentions, but only for negatively

wrapped review sets. As perceived usefulness reflects the perceived diagnosticity of the information [Mudambi & Schuff 2010], our results demonstrate that negative primacy-recency reinforcement (i.e., negative wrap) can enhance information diagnosticity, compared to a negative first and positive last review). The enhanced diagnosticity of the wrapped reviews increases their impact on behavioral intentions. For review sets that start with a positive review, the effect of positive wrapping on intentions is direct-only, and not mediated by perceived usefulness. It seems that positive wrap is not perceived as more useful and usefulness in this case also does not impact intentions. This may signal a more peripheral effect of positive wrapping on behavioral intentions. It is well documented that negative information is indeed more diagnostic than positive information (negativity bias) [Lee 2013; Rozin & Royzman 2001]. Positive information is often more ambiguous, since people expect products or services to have at least some positive attributes. Therefore, a positive review is less likely to be considered as helpful to categorize the reviewed object as high quality [Lee & Youn 2009]. However, for positive reviews, this does not seem to be a necessary condition for positive impression formation. Rather, when both the first review and last review are both positive, people more automatically adjust their behavioral intentions positively, without considering the usefulness of that information. Further research should seek to further explain these alternative processing mechanisms.

Future research should replicate the results for other products, including search goods and products with differing levels of involvement. The current research was based on reviews that were either clearly positive or clearly negative. Future research should also include reviews that contain both positive and negative elements in a single review to further enhance ecological validity. We also used reviews that were of equal importance to consumers. Future studies could explicitly test to what extent the relative importance of reviews in a set mitigates the wrap effect. Participants in our study were exposed to a review set in which positive and negative reviews were randomly ordered and presented one by one. When reading a certain review, participants did not know what the next review would look like. This was done to control for potentially confounding factors. However, there is no standard rule in presenting reviews. Website providers may present the reviews one by one, or a number of them at the same time. Further research can investigate how wrap effects work in different exposure contexts. Review websites often offer rating scores or a combined average score over a couple of reviewers and other visual elements [Malthouse & Shankar 2009]. The availability of such scores or visual elements may affect decision making as they provide the reader with shortcut means to quickly evaluate the quality of the target object [Tsang & Prendergast 2009]. Further research can include these variables and explore to what extent they influence judgment formation. Finally, this study uses self-reported behavioral intention as the dependent variable. Although a number of studies document that there is a strong correlation between intention and actual purchase behavior [Yen et al. 2011], intention does not always predict actual behavior. Future research should consider how the ecological validity of experimental research in online environments could benefit from more naturalistic settings and measurements of actual behavior.

5.2. Managerial implications

In reality, no product or service generates only positive or negative consumer reviews. Our research also shows that the vast majority of consumers reads more than one review. Consequently, consumers are often faced with contradictory information. By understanding how the balance and sequence of reviews influence decision making, companies can adapt their strategies to not only stimulate review readers' impression and attitude, but also their purchase intention and further eWOM intention.

When the first review a reader encounters is positive, the positive first impression is reinforced by reading a "closing" review later which is also positive. In order to stimulate positive wrapping, brand managers may try to motivate satisfied customers to share their positive opinions on the Internet, because reading a first positive review is a necessary condition to create positive wrap. In addition, if a higher number of positive reviews exist on the Web, the chance increases that review readers will stop reading at a positive review. Additionally, brand managers may also try to influence the sequence in which reviews are presented. Arranging the comments in the positive wrap structure (positive/negative/ positive) would be beneficial. Some Web site providers by default show readers positive reviews first. This strategically and prominently placing of positive reviews is intended to maximize the primacy effect, which may be reinforced, as mentioned, if they also provide positive reviews later in the sequence.

A good customer relations center may also reduce the number of negative reviews posted online. Brand managers should encourage dissatisfied customers to voice their complaints to the company itself, so that they may satisfactorily solve them before the negative comments are posted all over the Web for everyone to see. Or they may encourage reviewers to either delete or nuance negative reviews after certain issues have been addressed. This is especially important because the effects on review readers' purchase intention and recommendation intention may be detrimental if they read negative reviews as both the first and last review.

Obviously, there are ethical implications of manipulating review sequence in function of their valence, since this could be qualified as misleading. Online reviewers generally share their experience free of charge and on a voluntary basis, with the main purpose to inform other consumers through independent and unbiased review information.

Review Web site hosts should take into account that this lofty goal might be threatened by wrap effects. If this is the case, they should carefully monitor sequence effects to avoid both positive and negative wrap sequences, since these create undesirably skewed behavioral intentions. The occurrence of unintentional wrap effects may be highly likely when reviews are simply presented chronologically. Opting for a sort of "ranking system" (negative to positive, or positive to negative) may induce more unbiased impressions. In some platforms, reviewers do not only post reviews of objects, but also post replies to earlier reviews of others. In this case, the message order manipulation might not be sensible as the reviews also generate a complete discussion.

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