How Regulatory Orientation and Feelings of Gratitude Shape Online Review Helpfulness

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Online review helpfulness ratings are an important indicator of the impact of online reviews. Often times, helpfulness is explained in terms of observable qualities of online reviews that predict helpfulness ratings. This research proposes that focusing on the psychological processes that underlie helpfulness voting informs a better understanding of what shapes review helpfulness ratings. Specifically, because goal orientation influences information processing, consumers' regulatory orientation interacts with review valence to determine review helpfulness. When review valence and regulatory orientation match, consumers are more likely to express helpfulness through voting. The findings show that this effect occurs at least in part because matching review valence and regulatory orientation instills feelings of gratitude towards the reviewer. As a consequence, consumers are more likely to reward the reviewer with a helpfulness vote to express their feeling of gratitude through actions. However, when reviewers actively state expectations of reciprocal behavior by readers, gratitude is reduced and so is the likelihood that a review receives a helpfulness vote. Evidence from five studies using review data and online experiments show support for these effects.

Keywords Online consumer behavior; Agents; Recommendations; And word of mouth; Goals and motivation; Affect and emotion

Feeling gratitude and not expressing it is like wrapping a present and not giving it.
– William Arthur Ward

Despite the extensive research on online reviews and their impact on consumer decision-making, there is disagreement on the role that a review's valence plays with regard to helpfulness (Purnawirawan, Eisend, de Pelsmacker, & Dens, 2015). Some research shows that negative reviews are

more helpful than positive reviews, while other evidence indicates that positive reviews are more helpful than negative reviews (Babic Rosario, Sogtiu, De Valck, & Bijmolt, 2016). Moreover, research that addresses why consumers vote certain reviews as helpful but dismiss others as not helpful is scarce (Kuan, Hui, Prasarnphanich, & Lai, 2015). Understanding these processes is essential because firms adapt their review systems to rely more heavily on helpful reviews (Rubin, 2015). As a result, they also take measures to increase the number of readers who express review helpfulness through voting (Tyson, 2016). In the context of this study, expressed helpfulness is defined as the reader's decision to vote a review as helpful.

This research attempts to reconcile previous findings on the role of valence and focuses on the process that underlies readers' decision to vote a review as helpful. Specifically, it is proposed that regulatory orientation (Higgins, 1997) moderates the helpfulness of positive and negative reviews. In turn, this interactive effect should inform subsequent helpfulness voting behavior because helpful advice leads readers to develop feelings of gratitude towards the

reviewer. The reciprocal nature of feeling grateful should increase the probability that a reader will vote a review as helpful because he or she wants to express the felt gratitude.

Online recommendations influence sales and shape consumers' product attitudes (Schlosser, 2011). However, a large number of reviews for an increasing number of products creates problems such as information overload (Gottschalk & Mafael, 2017). Helpfulness ratings assist consumers in evaluating reviews efficiently and facilitate identification of the most relevant reviews. Improving this metric is important for firms because both consumers (Mudambi & Schuff, 2010) and review websites (Anderson, 2015) give more weight to helpful reviews.

The present research extends the existing literature on review helpfulness in two ways. First, this paper discusses consumers' regulatory orientation as a goal-pursuit framework that provides predictive value regarding individual differences in information perception. It then proposes conditions under which positive or negative reviews can be more helpful to consumers. Most research has focused on review or reviewer characteristics to explain the effect of valence on review helpfulness. This research suggests that goal orientation also influences which type of valence is more relevant to readers when identifying helpful reviews and that this contributes to readers' decision to express helpfulness. This extends prior research on review helpfulness voting (Cao, Duan, & Gan, 2011; Kuan et al., 2015) and the influence of goal orientation on review persuasiveness (Zhang, Craciun, & Shin, 2010).

Moreover, the present findings suggest that the development of gratitude towards the reviewer is a key process that influences the voting decision. As the findings show, whether or not the reader is grateful depends on whether the review matches his or her regulatory orientation. This finding extends the emerging literature that links goal orientation to the development of gratitude (Mathews & Shook, 2013) and thereby provides more insight to the role that giving matching advice plays in determining a grateful response. Further, the findings on the role of gratitude hint at ways in which reviewers can affect readers' gratitude towards them.

The remainder of this paper proceeds as follows. First, the literature on review helpfulness and the role of review valence is discussed. Second, it is argued why accounting for readers' regulatory focus is important when making predictions about the helpfulness of different reviews. Third, the gratitude literature is reviewed and the relationship between review valence, regulatory focus, and gratitude for review helpfulness are discussed. Fourth, an argument for facets in a review that may inhibit the development of gratitude in readers is proposed.

This research derives a framework that relates the key concepts to each other and tests these relationships in five studies. A discussion of the results and an elaboration on the theoretical and practical contributions of the findings, as well as their limitations and potential avenues for future research, conclude this manuscript. Please see Figure 1 for an overview of the conceptual framework.

Review Helpfulness and Review Valence

A helpful online review is a "peer-generated product evaluation that facilitates the consumer's purchase decision process" (Mudambi & Schuff, 2010). Helpfulness is determined by the evaluation of the review with regard to decision-making and expressed through voting a review as helpful. Research on the determinants of review helpfulness has identified different factors contributing to helpfulness on an aggregate level but remains inconclusive regarding the role of review valence in determining helpfulness (Hong, Di, Wang, & Fan, 2017; Purnawirawan et al., 2015). More importantly, these insights have not been able to explain the process underlying the voting decision (Kuan et al., 2015).

Review valence refers to the positivity or negativity of review content and is signaled by the review's star rating. Prior research indicates that negative reviews have a stronger negative impact on sales in comparison to the positive impact of positive reviews (Chevalier & Mayzlin, 2006). One possible reason for this effect is that negative information is more diagnostic than positive information (Herr, Kardes, & Kim, 1991). As negative reviews also occur less frequently than positive reviews, their content appears less biased and more credible (Sen & Lerman, 2007). Some studies find that negative reviews are more helpful, but only under certain conditions. For example, product characteristics (Mudambi & Schuff, 2010), review quality (Wu, 2013), and review extremity (Cao et al., 2011) have all been shown to influence the helpfulness of negative reviews. On the other hand, Pan and Zhang (2011) show that positive reviews have a higher probability to receive helpfulness votes. Babic Rosario et al. (2016) provide further evidence for this effect and show that positive reviews also influence consumers' decisions to a greater extent than
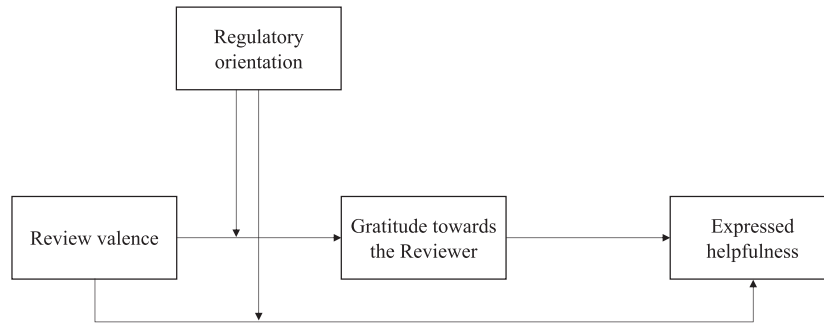
Figure 1. Conceptual framework.

negative reviews. Wu (2013) finds that positive reviews are perceived as more helpful when the overall rating of the product is negative.

Taken together, there is no clear evidence of whether negative or positive reviews are more helpful. One possible reason is that existing research has focused on review characteristics but largely omits the role of goal orientation. Decision goals shape the relevance and salience of different informational cues (Aaker & Lee, 2001) and determine whether the information is used as decision input (Langan, Besharat, & Varki, 2017).

More specifically, the relevance of positive or negative information could depend on the compatibility of the information with the current goal orientation (Skowronski & Carlston, 1987). This research proposes that regulatory focus provides insight into the differential relevance of positive and negative online reviews to consumers.

Regulatory Orientation and the Relevance of positive and Negative Online Reviews

According to regulatory focus theory, individuals operate under two dominant regulatory orientations that influence attitudes and behavior (Higgins, 2000). Promotion focus relates to individuals' self-regulation with regard to their hopes and aspirations. Prevention focus relates to self-regulation with regard to individuals' duties and obligations. Promotion focus aims at achieving positive outcomes, thus contributing to advancement and accomplishment while prevention focus aims at minimizing negative outcomes, which contributes towards safety and security (Higgins, 1997). These higher-order goals in turn shape pursuit goals that are more concrete, such as functional goals related to product usage (Aaker & Lee, 2001). Which regulatory orientation prevails can also change as a function of the specific situational context (Keller &

Bless, 2006) or the consumption goal (Zhou & Pham, 2004). Regulatory focus theory is therefore useful to describe behavior at a broad level of general tendencies that guide individual behavior but also to explain the influence of different decision contexts (Cesario, Corker, & Jelinek, 2013).

Regulatory Orientation and the Relevance of Information

Regulatory orientations also shape the relevance of different means, such as information, to the decision maker (Avnet & Higgins, 2006). Therefore, when a piece of information matches the recipient's regulatory orientation, this information is more likely to aid in the decision process and is evaluated more favorably (Cesario, Grant, & Higgins, 2004). Hence, regulatory orientation may affect the relevance of information (Pham & Avnet, 2004). This proposed matching process could be used to better understand the relationship between review valence and helpfulness. Specifically, regulatory orientation may determine whether a positive or a negative review is more relevant for decision-making. When the review is relevant, this increases its likelihood to be helpful to the reader. In this case, review valence serves as the message frame that helps consumers make sense of the implications of positive or negative reviews for their decision.

A positive review emphasizes a product's qualities and helps consumers make up their mind about its performance relative to other alternatives. As a result, following a positive review will likely result in the presence of positive outcomes, while not following such a recommendation will likely result in the absence of positive outcomes. Hence, positive reviews may be more helpful when a promotion focus is active. Contrary to positive reviews, negative reviews will be more helpful to consumers who operate under a prevention focus. Negative reviews point out a product's shortcomings and

provide reasoning for other consumers not to buy the product relative to other alternatives. Not following a negative review is more likely to result in a decision that leads to the presence of a negative outcome, for example buying a faulty product that breaks down quickly, while following such a recommendation more likely results in the absence of negative outcomes. Hence, negative reviews may be more helpful when a prevention focus is active.

Regulatory orientation is based on individuals' concerns or interests that may arise from a variety of sources (Avnet & Higgins, 2006). For example, situational context primes such as advertising messages may cue regulatory orientations (Micu & Chowdhury, 2010). Similarly, different attributes and benefits associated with different products may also cue regulatory orientations. For example, buying antivirus software most likely serves the goal that consumers want to prevent a virus from entering their operating system (Zhang et al., 2010). Certainly, different benefits associated with a product can cue different regulatory orientations (Lee & Aaker, 2004). However, some products are likely to relate more to prevention or promotion concerns because of the main function they serve (e.g., preventing a virus infection). Hence, the context of a specific product may potentially cue a certain regulatory orientation and thereby influence the type of information that is relevant to that decision.

There is some evidence in the literature that is consistent with this proposition. Chernev (2004) examines consumer choice and finds evidence that weighing of product attributes is influenced by regulatory orientation. Specifically, promotion orientation is more compatible with hedonic product attributes while prevention orientation is more compatible with utilitarian attributes. Similarly, performance attributes were more compatible with promotion orientation while reliability attributes were more compatible with prevention orientation. In a similar vein, Levav, Kivetz, and Cho (2010) find that participants associate different product attributes more with promotion- or prevention-orientation and are likely to choose products where attributes are compatible with their regulatory orientation. These findings are consistent with research that suggests that consumers tend to compartmentalize product decisions into promotion-related or prevention-related categories. For example, Zhou and Pham (2004) find that when managing financial decisions, consumers develop separate mental accounts and that different financial products are more representative of promotion or prevention focus.

Consistent with this view, this research proposes that positive reviews are more compatible with the concerns of individuals operating under a promotion orientation, while the opposite holds for individuals operating under a prevention orientation. This matching further determines whether a review provides relevant advice and, consequently, will affect the likelihood that a review receives a helpfulness vote. Formally, this results in the following hypothesis:

H_1: Regulatory orientation moderates the effect of review valence on expressed helpfulness in such a way that positive (negative) reviews are more likely to receive a helpfulness vote when a promotion (prevention) orientation prevails.

The Effect of Gratitude Towards the Reviewer on Helpfulness Voting

Helpfulness votes are a means of stating one's appreciation for the advice transported through the review. Receiving advice, for example through online reviews, occurs because of others' intention to help and aid in decision-making (Goldsmith & Fitch, 1997). In fact, helping others is one of the main motives that drive consumers to share their opinion online (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004). Expressing gratitude as a response to help received is one of the basic mechanisms of functional social life (Emmons & McCullough, 2003). Central to the development of gratitude is the acknowledgment that someone else is responsible for a positive outcome. Gratitude is defined as "the willingness to recognize the unearned increments of value in one's experience" (Bertocci & Millard, 1963). Conceptually, gratitude entails two aspects. First, it refers to the emotions that are generated when a person feels that he or she has been the recipient of a benefit (Emmons & McCullough, 2003). Second, it refers to the behavioral reactions that result from a feeling of gratitude towards the benefactor. For example, when useful advice is received, feeling grateful for the benefits created through this advice motivates individuals to return the favor (Weiner & Graham, 1989). Because receiving benefits generates an obligation to repay the benefactor, gratitude has also been characterized as a "moral affect" (McCullough, Kilpatrick, Emmons, & Larson, 2001). Expressing one's gratitude,

therefore, serves as a means to reciprocate this "moral" obligation. Next, it is proposed how gratitude relates to expressed helpfulness.

Gratitude as a Reason for Helpfulness Voting

Both the emotional and behavioral aspects of gratitude offer insights when trying to explain a consumer's helpfulness voting behavior and the role of regulatory matching. Review websites, such as amazon.com, are a form of online community, where consumers communicate and exchange information (Forman, Ghose, & Wiesenfeld, 2008). Users share common interests because consumers looking for information about a certain product are relying on information from consumers who have already bought the product and share their advice. Even though reviewers and review readers usually do not know each other, readers are appreciative of reviewers that share helpful advice (Mathwick & Mosteller, 2017).

Research shows that as gratitude increases, so does the propensity to express it (Wood, Froh, & Geraghty, 2010). Gratitude encourages the recognition of help or advice received, as well as helping others in return, even when the benefactor or beneficiary is a stranger (DeSteno, Bartlett, Baumann, Williams, & Dickens, 2010). In the present study, it is proposed that feeling grateful depends on the matching of review valence to the current regulatory orientation because this affects whether the review advice is relevant to the reader. The increased relevance of positive reviews (negative reviews) for individuals who operate under a promotion (prevention) orientation, in turn, increases the perceived helpfulness of the review to the reader. Increased relevance and perceived helpfulness are closely linked because relevant advice is more likely to be helpful to consumers.

Therefore, the likelihood to express gratitude through a helpfulness vote as a way of thanking the reviewer should increase when individuals feel more grateful. In turn, readers feel more grateful when they receive relevant advice from the reviewer which depends on the interaction between review valence and regulatory focus. This results in the following hypothesis:

H_2: The interactive effect of regulatory focus and review valence on expressed helpfulness is mediated, at least in part, by readers' feelings of gratitude towards the reviewer.

Inhibiting Gratitude

Given the positive influence of gratitude on human behavior, another interesting question pertains to factors that inhibit gratitude (Solom, Watkins, McCurrach, & Scheibe, 2017). The perception of benevolence is central to the development of gratitude and also determines whether beneficiaries are likely to reciprocate. For example, Watkins, Scheer, Ovnicek, and Kolts (2006) find that when benefactors communicate clear expectations of reciprocal behavior, this may decrease gratitude because it suggests that the help received was not merely motivated by benevolence. When expectations are clearly communicated, this can inhibit the willingness to reciprocate (McCullough et al., 2001). If a reviewer asks the reader to cast a helpfulness vote this is a clear indication that he or she expects to receive something in return for help given. Importantly, this request is unreasonable when the review was less likely to convey helpful information. However, if the review itself is helpful because it matches the reader's regulatory focus, but the reviewer communicates expectations that reduce gratitude, the likelihood of the review being voted helpful is also reduced. Hence, when reviewers state reciprocity expectations, this should inhibit the interactive effect of valence and regulatory orientation on gratitude. As a result, readers are less likely to express helpfulness by voting the review as helpful. Consequently, the indirect effect of the interaction between review valence and regulatory orientation on expressed helpfulness through gratitude should be weaker when the reviewer states expectations.

H_3: The interactive effect of review valence and regulatory orientation on gratitude is moderated by reciprocity expectations in such a way that when the reviewer states expectations (vs. states no expectations) the effect is stronger (weaker).

Overview of Studies

Five studies are conducted to test these predictions. Across these studies, the hypotheses are tested using different conceptualizations of regulatory orientation, different products, and different data sources. Specifically, study 1 examines review data from amazon.com and explores the interactive effect of review valence and regulatory orientation on helpfulness counts. Study 2a provides initial

evidence that positive and negative reviews differ with regard to their perceived relevance, depending on readers' regulatory orientation. Study 2b replicates the results of study 1 and finds support that valence and regulatory orientation interactively influence helpfulness voting. More importantly, study 2b provides evidence for the mediating role of gratitude towards the reviewer. Study 2c establishes the robustness of these effects. Finally, study 3 focuses on the underlying mechanism and manipulates the level of gratitude towards the reviewer. Thus, building on the finding that gratitude mediates the interactive effect of regulatory orientation and valence on expressed helpfulness (Studies 2b and 2c), it retests this mechanism through moderation.

Study 1: Analysis of Online Review Data

The first study utilizes online review data collected in November 2016 from amazon.com to test H_1. Amazon.com specifies that low ratings (e.g., 1- and 2-star ratings) equate to negative product experiences and high ratings (e.g., 4- and 5-star ratings) equate to positive product evaluations. In addition, users provide a text where they describe their experience with the product. The number of helpfulness votes each review has received is displayed alongside the review. Amazon.com also asks readers whether the review was helpful to them or not. At the time of data collection, "Yes" and "No" were the two options. The platform only displays helpfulness votes (i.e., votes where readers selected "Yes") when the review has received at least one vote.

Pretest

To measure whether consumers associate certain product categories more with promotion or prevention goals, a pretest with one hundred and eleven participants recruited from MTurk (M_{age} = 36 years, 64% female) was conducted. The aim was to obtain a proxy for consumers' regulatory orientations in relation to different products. In total, 48 products from ten product categories (e.g. toys, sports and fitness, outdoor, books, computer and electronics) were included. Participants were divided into four groups and each group evaluated a randomly allocated set of twelve products from the different categories. Following a short product description, participants rated whether their goals when seeking to purchase a respective product were more representative of a promotion or a prevention orientation. Three 7-point bipolar scales measured to what extent participants thought that 1) avoiding negative consequences (vs. achieving positive consequences; 1 = avoiding, 7 = achieving), 2) protecting qualities (vs. enhancing qualities, 1 = protecting, 7 = enhancing), and 3) reliability (vs. attractiveness, 1 = reliability, 7 = attractiveness) were more relevant when looking for each product. The poles represented outcome orientation (orientation away from negative outcomes vs. orientation towards positive outcomes, Dholakia, Gopinath, Bagozzi, & Nataraajan, 2006), captured qualities that are more relevant to such an orientation (protecting vs. enhancing qualities, Zhang et al., 2010), and the focus on dominant attributes (reliability vs. attractiveness, Chernev, 2004). All three items were averaged to form a perceived regulatory orientation index. The average Cronbach's α value was adequate for all four 12-product sets (α = .73), as well as the average variance extracted across all product sets (AVE = 70.35%). For a full account of the descriptive statistics, as well as detailed results for reliabilities and average variance extracted for all products, please refer to the Methodological Details Appendix (MDA) S1.

Data Collection

Next, two pairs of products that belonged to similar categories but differed significantly with regard to their perceived regulatory orientation scores were identified. Specifically, two camera products (surveillance camera, M = 2.71, and digital camera, M = 4.59, $t(53)$ = 5.59, $p < .001$), and two software products (tax software, M = 2.74, and video game, M = 5.75, $t(54)$ = 8.36, $p < .001$) were selected. The two product pairs possess similar technical functionality. From each of these four product categories, five of the ten bestselling products from November 2016 were randomly selected and all available review data was downloaded, resulting in 8.855 reviews. Prior to the analysis, reviews without text or with non-English symbols (16 total), less than two words of text (123 total), or duplicate reviews (one review can be displayed for various variations of one product, 408 total) were filtered from the dataset. 8.308 product reviews remained in the final dataset.

Variables

Helpfulness of a review was measured as the number of helpful votes for each review. The default ordering of reviews on Amazon at the time of data collection was by date and users had to

apply filters to alter this order. Several control variables were included. Specifically, review length (Korfiatis, García-Bariocanal, & Sánchez-Alonso, 2012), ease of readability (Kuan et al., 2015), star rating (Mudambi & Schuff, 2010), review age (Chen & Lurie, 2013), reviewer identity (Forman et al., 2008), and verified purchase were included. Review length indicated the number of characters for each review. Ease of readability was measured as the Coleman-Liau-Index (CLI, Coleman & Liau, 1975). Star rating measured the number of stars a reviewer allocates to the product. Review age measured the number of days that a review was online by subtracting the day that each review was posted from a baseline date (November 15th, 2016). Reviewer identity captured whether the reviewer disclosed a name or not (1 = disclosed a name, 0 = else). Verified purchase indicated whether the review was accompanied by a "Verified Purchase" information (1 = verified, 0 = else). Table 1 provides an overview of the data, variables, and descriptive statistics.

Data Properties

Several properties of the data guided the estimation. First, the dependent variable (number of helpfulness votes) is a count variable that ranges from zero (received no votes so far) to any positive integer. In the case of count data where the variance of the count variable is higher than its mean (Here: $\sigma^2_{across\ categories} = 234.1$, $M_{across\ categories} = 5.6$), a negative binomial model is appropriate to address the properties of the data (Gardner, Mulvey, & Shaw, 1995).

Second, 64.32% of reviews received no votes and there may be systematic reasons why a review has not received helpfulness votes (Kuan et al., 2015). Given the excess number of reviews with no votes, a zero-inflated negative binomial regression was utilized. Zero-inflated models estimate a logistic regression to predict the probability that reviews receive zero votes and a negative binomial regression to predict the effect of the focal independent variables on the probability that a review receives helpfulness votes. Here, length, CLI, reviewer identity, and verified purchase were included to estimate the logistic regression. The negative binomial regression is the focal part with regard to hypothesis testing and included star rating, the regulatory orientation related to the product and their interaction as the independent variables.

Third, there are significantly more positive reviews (star rating > 3, 74.6%) than negative reviews (star rating < 3, 19.1%). Thus, other unobserved factors may determine review valence and these factors may confound a comparison between positive and negative reviews. For example, due to their large number, positive reviews may feature more prominently on the review website and might, therefore, receive more votes because of exposure. This poses a potential bias and a threat

Table 1
Variables and Descriptive Statistics

Product type	Category: Camera		Category: Software/Entertainment	
	Digital camera	Surveillance camera	Tax software	Video game
Regulatory character	Promotion	Prevention	Prevention	Promotion
Number of reviews	1690	2806	2473	1886
Average star rating	4.2 (1.3)[a]	4.1 (1.4)	4.1 (1.3)	3.7 (1.6)
% of 1-star reviews	9.6%	12.8%	11.3%	19.9%
% of 2-star reviews	4.9%	4.5%	3.0%	8.6%
% of 3-star reviews	6.6%	4.8%	5.9%	8.2%
% of 4-star reviews	14.6%	14.6%	19.2%	11.2%
% of 5-star reviews	64.4%	63.3%	60.6 &	52.0%
Average helpfulness votes	4.5 (28.8)	2.1 (10.9)	0.9 (6.9)	3.4 (14.6)
Reviewer identity (1 = disclosed, 0 = else)	1 = 86.6%	1 = 82.4%	1 = 85.3%	1 = 81.7%
Verified purchase (1 = verified, 0 = else)	1 = 90.4%	1 = 68.7%	1 = 57.4%	1 = 62.6%
Average lifetime of a review (in days)	267.9 (194.5)	93.2 (116.9)	214.3 (208.7)	75.7 (91.2)
Average review length (in syllables)	286.9 (526.4)	343.7 (560.9)	263.7 (388.8)	422.8 (818.4)
Average CLI	16.6 (5.1)	16.2 (4.3)	16.6 (4.5)	15.8 (4.9)

Note. [a]Standard deviations reported in parentheses.

that positive and negative reviews differ systematically on covariates. Propensity score matching offers a solution to reduce potential bias and create quasi-experimental conditions. In a randomized experiment, the randomization enables unbiased estimation of treatment effects; however, observational data does not offer this benefit (Abadie & Imbens, 2008). Matching uses a pairing of treatment (here: negative reviews) and control units (here: positive reviews) that are similar in terms of their observable characteristics. Hence, the procedure identifies statistical twins from the treatment group that match with comparable observations from the control group to create unbiased effect estimates (Deheija & Wahba, 2002). More specifically, a propensity score is calculated across all reviews. The propensity score is the conditional probability of assignment to either the positive or negative review group based on a vector of covariates. Matched reviews were comparable across a set of review characteristics. All subsequent estimations were carried out on the matched sample.

Estimation and Results

First, relevant covariates were selected from the pool of review characteristics that were not related to the star rating. Specifically, regulatory orientation, review length, CLI, review age, reviewer identity, and verified purchase were included as covariates. The treatment variable for the matching procedure was review valence and the helpfulness vote count was the dependent variable. All negative reviews (star rating < 3) were coded as 1 and all positive reviews (star rating > 3) were coded as 0 (Chen & Lurie, 2013). The final dataset before matching, therefore, consists of 7,784 reviews because 524 reviews had a star rating of 3 and were excluded. Of the 7,784 reviews, 79.66% were positive and 20.34% were negative.

Second, matching positive and negative reviews using the vector of covariates identified 2,024 reviews that were either positive or negative, but otherwise comparable on the covariates. The details of the matching procedure can be found in the MDA, Appendix S1.

Third, a zero-inflated negative binomial regression model was estimated on the matched subset of reviews to test the interactive influence of regulatory orientation and review rating on helpfulness count. The matched dataset consisted of 943 reviews with one or more helpfulness votes and 1,081 reviews with zero helpfulness votes. Further,

the dataset included 1,142 reviews for products that were more related to a prevention orientation and 882 reviews for products that were more related to a promotion orientation. The zero-inflated model fit the data better than the standard negative binomial model ($z = 4.22$, $p < .001$) and, compared to a model without predictors, the estimated model performed significantly better ($\chi^2/df = 69.81$, $p < .001$). The zero-inflation model showed that only length significantly predicts the number of excess zeros. The log odds of receiving zero helpfulness votes would decrease by .01 for every additional word in a review.

In the negative binomial regression model, star rating, regulatory orientation, and their interaction significantly predicted the number of review helpfulness votes. Coefficients in a negative binomial model indicate the expected changes in log(helpfulness) for different values of the independent variables. Review valence was negatively related to helpfulness votes ($\beta = -.72$, $SE = .09$, Wald's $\chi^2 = 58.73$, $p < .001$). Compared with positive reviews, negative reviews were less likely to receive helpfulness votes. Further, regulatory orientation was negatively related to helpfulness votes ($\beta = -.46$, $SE = .12$, Wald's $\chi^2 = 13.45$, $p < .001$) such that products that were more related to a prevention orientation were less likely to receive helpfulness votes compared to products that were more related to a promotion orientation. Finally, the interaction between review valence and regulatory orientation (i.e., the matching effect) was positively related to helpfulness votes ($\beta = .71$, $SE = .15$, Wald's $\chi^2 = 21.71$, $p < .001$). Further evaluation of the mean differences in predicted log(helpfulness) across conditions of the predictors revealed that negative reviews for prevention products are more likely to receive helpfulness votes as compared to negative reviews for promotion products (1.52, $SE = .54$, $p < .01$). Similarly, positive reviews for promotion products were more likely to receive helpfulness votes as compared to positive reviews for prevention products (4.08, $SE = 1.05$, $p < .001$). Interestingly, the results suggest that, overall, positive reviews for promotion products also have a higher likelihood to receive helpfulness votes as compared to negative reviews for prevention products (4.20, $SE = .86$, $p < .001$).

Thus, the general pattern of results supports the prediction that the probability that positive and negative reviews receive helpfulness votes depending on consumers' regulatory orientation. They also seem to suggest that positive reviews have a higher probability to receive helpfulness votes. See the

MDA, A1 for an overview of the model results. Figure 2 plots the average number of helpfulness votes across positive and negative reviews.

Discussion

Study 1 provides initial evidence that the interaction between regulatory orientation and review valence influences the probability that a review receives a helpfulness vote. Specifically, positive reviews were more likely than negative reviews to receive helpfulness votes for promotion products, while negative reviews were more likely to receive helpfulness votes for prevention products. Overall, positive reviews were more likely than negative reviews to receive helpfulness votes.

Aggregate data provides distinct advantages regarding modeling and external validity but also has limitations. In particular, it is not clear why the interaction between review valence and regulatory orientation influences expressed helpfulness. Study 2a investigates the prediction that consumers perceive a positive or negative review's relevance differently depending on their regulatory orientation. In addition, the mean number of helpfulness votes for positive reviews in the review data was 9.83 compared to 6.21 for negative reviews. This might lead to positive reviews being displayed more prominently on the review website. Therefore, the accumulation

of helpfulness votes may be biased. Finally, the propensity score matching procedure aims to mirror the conditions of a quasi-experimental design but can only approximate a randomized experiment (Bullock, Green, & Ha, 2010). Study 2a, therefore, manipulates both independent variables separately.

Study 2A—Relevance of Positive and Negative Reviews Depending on Regulatory Orientation

Two goals guided this study. First, it tests a prerequisite of the proposed process that determines helpfulness ratings. In particular, do participants who are promotion oriented (vs. prevention oriented) judge positive (vs. negative) reviews as more relevant for their decision than negative (vs. positive) reviews if both are available? Second, in study 1, different product categories were used as a proxy for consumers' regulatory orientation. One concern may be whether the assumption that different products can cue regulatory orientation holds. Hence, replicating the findings from study 1 while priming regulatory orientation independently from the product would provide a means to assess the robustness of these findings. A 2 (review valence: positive vs. negative) × 2 (regulatory orientation: prevention vs. promotion) mixed experimental design tests this prediction.
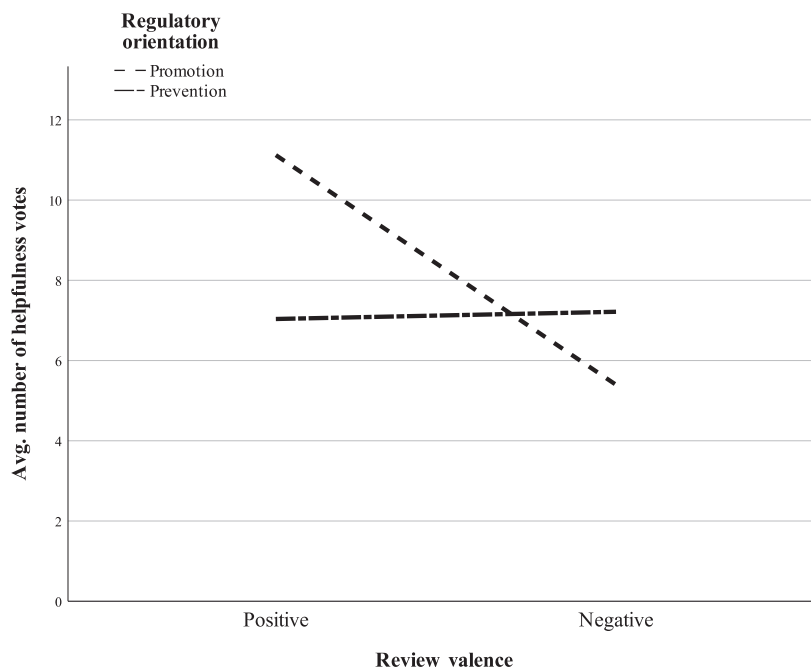

Figure 2. Average number of helpfulness votes for positive and negative reviews.

Method

One hundred and fifty-five participants were recruited from MTurk (M_{age} = 35 years, 51% male) in return for a small compensation (\$ 0.15). Regulatory orientation was primed using an established procedure where participants list two examples of their hopes and aspirations or their duties and obligations (Pham & Avnet, 2004). Next, in a seemingly unrelated study, respondents were told to imagine that they were currently in the market for an activity-tracking device. This particular product was neither rated as clearly promotion- nor as clearly prevention-related in the pretest conducted in study 1 (M = 4.01, SD = 1.03). Respondents in both regulatory orientation conditions received the same set consisting of six online reviews (three positive and three negative reviews) presented in a randomized order. All six reviews were adapted from amazon.com and selected from the 1-star and 5-star rating categories. Please see the MDA, Appendix S2 for the review stimuli. All reviews were comparable in length and had received a similar number of helpfulness votes. Respondents indicated the extent to which they would consider each review relevant to their decision (from 1 = not at all relevant to 7 = very relevant).

Results

The manipulation check confirmed that the regulatory orientation manipulation was successful. Respondents who were asked to list duties and obligations were more focused on something they ought to do, while respondents who were asked to list hopes and aspirations were more focused on something they want to do (1 = something I ought to do, to 7 = something I want to do, $M_{Prevention}$ = 3.93, $M_{Promotion}$ = 5.33, $F_{1, 153}$ = 20.62, p < .001).

To assess differences in perceived relevance of positive and negative reviews under promotion or prevention orientation, relevance scores for all positive (negative) reviews were aggregated to form a positive (negative) review relevance score. The findings show that those who were primed with a promotion orientation perceived positive reviews as more relevant than those who were primed with a prevention orientation ($M_{Promotion}$ = 5.29, $M_{Prevention}$ = 4.85, $F_{1, 153}$ = 5.32, p < .05). A similar pattern emerged for negative reviews where participants who were primed with a prevention orientation perceived negative reviews as more relevant than those who were primed with a promotion orientation ($M_{Prevention}$ = 5.30, $M_{Promotion}$ = 4.78, $F_{1, 153}$ = 6.65, p < .05). A test of within-subjects contrasts confirmed these differences ($F_{1, 153}$ = 15.35, p < .001).

Discussion

Study 2a builds on the findings of study 1 and investigates whether regulatory orientation influences the relevance of positive and negative reviews. The findings support the predicted effects. Specifically, negative reviews seem to be more relevant for consumers when a prevention orientation is active while the opposite holds for positive reviews. However, in online-shopping environments, it is difficult for firms to influence consumers' regulatory orientation through unrelated primes. Thus, study 2b extends these findings and manipulates regulatory orientation through product description.

Further, study 2a investigated perceived relevance, but not expressed helpfulness. The question remains whether the interactive effect of review valence and regulatory orientation affects expressed helpfulness. Study 2b addresses this question. Finally, it tests gratitude towards the reviewer as a potential mediator.

Study 2B—The Mediating Effect of Gratitude on Expressed Helpfulness

Study 2b examines the process that shapes expressed helpfulness. Review websites typically feature product descriptions and several pictures that are similar to textual advertisements (Lee & Aaker, 2004) before exposing consumers to reviews. Therefore, a situational regulatory orientation prime featuring a product advertisement was used in study 2b. From a managerial perspective, it would be particularly interesting to obtain similar results using consumption-related stimuli, such as product descriptions or advertisements (Zhang & Yang, 2015).

Stimuli Development and Pretests

Regulatory orientation frame.   Regulatory orientation was manipulated through a promotion frame or a prevention frame in the advertising content (see the Figure S1 for the stimuli). The focal product, sunscreen, has been used successfully to manipulate promotion and prevention orientation in previous research (Lee & Aaker, 2004). Both product descriptions made claims that were compatible with two common ingredients of sunscreen (Feily & Namazi, 2009; Smijs & Pavel, 2011).

In the promotion frame, the advertisement featured the tagline "SunnySide® Glorify your skin!" Participants read that the sunscreen was beneficial for attaining beautiful skin and nourishment while basking in the sun. Further, the active ingredients in the sunscreen would contribute to the nutritious qualities of the product and promote skin moisture levels. In contrast, in the prevention frame, the tagline read "SunnySide® Protect your skin!" Participants read that the sunscreen was useful to protect their skin against sunray exposure and offered reliable protection while basking in the sun. They also read that ingredients included in the sunscreen would create a protective layer on the skin and would reduce one of the major risk factors for skin cancer.

The pretest ($N = 46$, $M_{age} = 39$ years, 56.5% female) measured whether the stimuli induced prevention- or promotion-oriented thoughts. Participants were randomly assigned to one of the two advertisement conditions (promotion vs. prevention). Promotion focus was measured by asking respondents whether their thoughts were more focused on promoting beautiful skin, while prevention focus was measured by asking respondents whether their thoughts were more focused on preventing skin cancer (1 = not at all to 7 = very much). Participants who saw the promotion-oriented advertisement were more focused on promoting beautiful skin ($M_{Promotion} = 5.24$ vs. $M_{Prevention} = 4.29$; $F_{1, 45} = 4.82$, $p < .05$), while participants who saw the prevention-oriented advertisement were more focused on preventing skin cancer ($M_{Prevention} = 5.38$ vs. $M_{Promotion} = 3.96$; $F_{1, 45} = 8.59$, $p < .05$). Please refer to the MDA, Appendix S3 for more details on the pretest.

Review valence. The other set of stimuli contained six online reviews (three negative and three positive reviews) to manipulate review valence. The content of the reviews was adapted from reviews for several sunscreen products sold on amazon.com. A pretest ($N = 37$, $M_{age} = 41$ years, 51.4% male) subjected participants to a set of three positive and three negative reviews and asked them to evaluate the reviews on various measures, such as readability, credibility, and perceived helpfulness. One positive review and its negative counterpart were rated more favorably on all measures and were selected for the main study. The negative and positive review had similar content, but key valence words were changed (e.g., "good sunscreen" vs. "bad sunscreen"; "greasy" vs. "creamy"). Please see the MDA, Appendix S3 for the two online reviews that were included in the main study.

Main Study

One hundred and ninety participants recruited from MTurk ($M_{age} = 39$ years, 53% female) were randomly assigned to a condition in a 2 (regulatory orientation: promotion vs. prevention) × 2 (review valence: positive vs. negative) between-subjects design. The participants completed the study in exchange for monetary compensation ($ 0.20).

First, participants read a short briefing about the experimental procedure and answered questions that measured their attitude towards online reviews ("I always check online consumer reviews before making a purchase," "I think that online consumer reviews are generally helpful," "Online consumer reviews often influence my purchase decision," "I typically read online consumer reviews before making a decision" 1 = completely disagree to 7 = completely agree). A particularly positive or negative attitude towards reviews might influence readers' willingness to credit reviewers for valuable advice.

Second, participants were told to study the advertisement. On the following page, participants answered the manipulation check ("After looking at the advertisement, what are your thoughts now more focused on?," 1 = preventing skin cancer to 7 = promoting beautiful skin). On a separate page, they evaluated the online review on a set of questions regarding perceived helpfulness ("How helpful did you find this online review?", 1 = not at all to 7 = very much), valence ("How positive or negative do you perceive this online review?," 1 = very negative to 7 = very positive), review credibility ("How credible was this online review?", 1 = not at all to 7 = very much), convincingness of the arguments within the review ("How convincing were the arguments presented in this online review?", 1 = not at all to 7 = very much), and how they felt towards the reviewer ("grateful", "thankful," "appreciative," 1 = very slightly to 7 = extremely, Emmons & McCullough, 2003). On the next page, respondents expressed their helpfulness rating by either voting "Yes, this review was helpful to me" or "No, this review was not helpful to me" (1 = Yes, 0 = No). On the final page, participants indicated trait gratitude (GQ6-scale, McCullough, Emmons, & Tsang, 2002) and demographics. High levels of trait gratitude may increase individuals' likelihood to feel and express gratitude.

Expressed Helpfulness

Expressed helpfulness was analyzed using a binary logistic regression with expressed helpfulness

as the dependent variable ($1 = \text{Yes}$, $0 = \text{No}$). Review valence ($1 = \text{positive}$), regulatory orientation ($1 = \text{promotion}$), and their interaction were included as independent variables. Review valence ($\beta = -1.46$, Wald's $\chi^2 = 6.87$, CI 95% $[-2.55, -.37]$, $p < .01$), regulatory orientation ($\beta = -1.15$, Wald's $\chi^2 = 4.17$, CI 95% $[-2.25, -.05]$, $p < .05$), and their interaction ($\beta = 2.79$, Wald's $\chi^2 = 13.42$, CI 95% $[1.29, 4.29]$, $p < .001$) all significantly predicted the log odds of expressed helpfulness. Specifically, the probabilities that a positive review in the promotion condition would receive a helpfulness vote were 87.5% (vs. 57.4% in the prevention condition) and 85.3% for a negative review in the prevention condition (vs. 64.8% in the promotion condition). When review valence and regulatory orientation matched, this significantly increased the log odds of expressed helpfulness (positive valence: $\beta = 1.34$, CI 95% $[.31, 2.36]$, $p < .01$; negative valence: $\beta = 1.46$, CI 95% $[.37, 2.55]$, $p < .01$). Thus, positive (negative) reviews are more likely to receive helpfulness votes when the reader operates under a promotion (prevention) focus. Figure 3 illustrates the conditional effect of review valence on expressed helpfulness in the promotion and prevention condition.

The Mediating Role of Gratitude

H$_2$ proposed that gratitude towards the reviewer mediates the interactive effect of regulatory orientation and review valence on expressed helpfulness. To test whether gratitude transmitted the matching effect, a moderated mediation model (Hayes, 2013; PROCESS model 8) was estimated (all PROCESS models were estimated using 10.000 bootstrap iterations). Review valence ($1 = \text{positive}$) was entered as
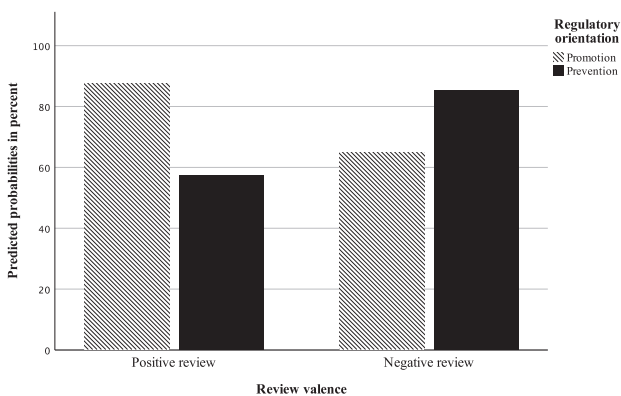
the independent variable, gratitude as the mediator, and expressed helpfulness as the dependent variable. Regulatory orientation ($1 = \text{promotion}$) was included as the moderator.

Gratitude was significantly predicted by regulatory orientation ($\beta = -.746$, CI 95% $[-1.35, -.14]$, $p < .05$) and review valence ($\beta = -.67$, CI 95% $[-1.30, -.04]$, $p < .05$). Consistent with the matching prediction, their interaction significantly predicted gratitude ($\beta = 1.72$, CI 95% $[.84, 2.59]$, $p < .001$). Specifically, when respondents were in the prevention condition and read a negative review, they were more grateful compared to when they read a positive review ($M_{\text{Prev\&Neg}} = 4.81$, $M_{\text{Prev\&Pos}} = 4.14$). Similarly, when respondents who were in the promotion condition read a positive review, they were more grateful compared to when they read a negative review ($M_{\text{Prom\&Pos}} = 5.11$, $M_{\text{Prom\&Neg}} = 4.07$). Simple effects analysis confirmed this pattern. That is, reading a positive review increased gratitude in the promotion condition ($\beta = 1.04$, CI 95% $[.44, 1.65]$, $p < .001$) but decreased gratitude in the prevention condition ($\beta = -.67$, CI 95% $[-1.30, -.04]$, $p < .05$). In contrast, reading a negative review increased gratitude in the prevention condition ($\beta = .97$, CI 95% $[.35, 1.58]$, $p < .001$) but decreased gratitude in the promotion condition ($\beta = -.75$, CI 95% $[-1.35, -.14]$, $p < .05$).

Further, gratitude had a positive effect on expressed helpfulness ($\beta = 1.40$, Wald's $\chi^2 = 44.46$, CI 95% $[.99, 1.87]$, $p < .001$). Neither review valence ($\beta = -.44$, Wald's $\chi^2 = .35$, CI 95% $[-1.88, .99]$, $p = .54$), regulatory orientation ($\beta = -1.07$, Wald's $\chi^2 = .34$, CI 95% $[-2.47, .32]$, $p = .13$), nor their interaction ($\beta = 1.52$, Wald's $\chi^2 = 2.19$, CI 95% $[-.49, 3.52]$, $p = .14$) were significant predictors of expressed helpfulness when gratitude was controlled for. Moreover, the conditional indirect effect of valence on expressed helpfulness through gratitude was significant in both regulatory orientation conditions (promotion: $\beta = 1.47$, CI 95% $[.63, 2.72]$; prevention: $\beta = -.94$, CI 95% $[-2.15, -.05]$). The index of moderated mediation provided further evidence for the significant mediating effect of gratitude ($\beta = 2.41$, CI 95% $[1.21, 4.37]$). Hence, the results suggest that gratitude mediates the matching effect on expressed helpfulness. When review valence and regulatory orientation matched, the resulting increase in gratitude had a positive impact on the likelihood of a review to receive a helpfulness vote.

Figure 3. The probability of expressed helpfulness as a function of review valence and regulatory orientation.

Ancillary Analyses

Differences in participants' trait gratitude or attitude towards online reviews may influence the effects. Two ANOVAs with review valence, regulatory orientation, and their interaction as independent variables and either trait gratitude scores or attitude scores as dependent variables did not reveal any main or interaction effects (all p's > .15; see MDA, Appendix S3 for details). Thus, there do not seem to be any systematic differences between the experimental groups. Further, re-estimation of the moderated mediation model revealed only a significant effect of the attitude score on gratitude (β = .33, CI 95% [.17, .49]) but no significant effect on expressed helpfulness.

Discussion

The results of study 2b provide initial evidence of the process that shapes readers' helpfulness voting. Specifically, matching regulatory orientation to the relevant review valence type leads readers to be more grateful towards the reviewer, while increased levels of felt gratitude influence readers' likelihood to express helpfulness. These findings were independent of participants' attitude towards online reviews and their trait gratitude.

Although the results offer support for the predicted effects, the adequacy of the regulatory focus manipulation may be questioned. Specifically, priming participants with a goal frame that relates to specific product benefits might not prime regulatory orientation, but rather specific consumption goals. To address this issue, study 2c attempts to replicate the findings using a different manipulation of regulatory orientation that is independent of the subsequent product reviews. Further, the robustness of the previous findings is assessed by using the likelihood to vote as a measure for expressed helpfulness.

Study 2C: Robustness of the Effect

Study 2c assessed the robustness of the previous findings. One hundred and sixty-one participants (M_{age} = 39 years, 61% female) recruited from MTurk participated in the study in exchange for a small compensation ($ 0.20).

Similar to study 2a, participants were initially primed with a regulatory orientation using a thought-listing task. Respondents were instructed to take a moment and think either about their hopes and aspirations (promotion focus) or about their duties and obligations (prevention focus). Next, they were asked to report their thoughts, followed up by a manipulation check. The manipulation check used a semantic differential and asked participants to state whether they were more focused on *"doing something I ought to,"* or on *"doing something I want to"* (1 = doing something I ought to 7 = doing something I want to).

This was followed by a seemingly unrelated second study, where participants were again in the market for a sunscreen product. They received either a positive or a negative review for the product. The review stimuli were identical to those used in study 2b. Thus, a 2 (regulatory orientation: promotion vs. prevention) × 2 (review valence: positive vs. negative) between-subjects design was employed. Upon reading the reviews, participants again indicated how grateful they felt towards the reviewer. Finally, they indicated their likelihood to express helpfulness through a vote ("How likely are you to vote this review as helpful?," from 1 = not at all likely to 7 = very likely). Three participants did not complete the thought-listing task and were eliminated from the sample. Thus, 158 respondents remained.

Results

As expected, respondents who were told to list duties and obligations were more focused on doing something they ought to, while respondents who were told to list hopes and aspirations were more focused on doing something they wanted to ($M_{Prevention}$ = 3.38, $M_{Promotion}$ = 4.67, p < .001, $F_{1, 156}$ = 19.62, p < .001).

The same moderated mediation model as in study 2b (PROCESS model 8) was used to assess the mediating role of gratitude. Gratitude was significantly predicted by review valence (β = −.88, CI 95% [−1.56, −.20], p < .01) and by regulatory orientation (β = −1.11, CI 95% [−1.99, −.23], p < .01). Again, consistent with the matching prediction, their interaction significantly predicted gratitude (β = 2.04, CI 95% [.88, 3.20], p < .001). A similar interactive pattern as in study 2b emerged. Specifically, reading a positive review increased gratitude in the promotion condition (β = 1.16, CI 95% [.22, 2.10], p < .01) but decreased gratitude in the prevention condition (β = −.88, CI 95% [−1.56, −.20], p < .05; $M_{Pos\&Prom}$ = 5.13, $M_{Pos\&Prev}$ = 4.2). In contrast, reading a negative review increased gratitude in the prevention condition (β = .93, CI 95% [.16, 1.70], p < .001) but decreased gratitude in the

promotion condition ($\beta = -1.11$, CI 95% [-1.99, $-.23$], $p < .05$; $M_{\text{Neg\&Prom}} = 3.97$, $M_{\text{Neg\&Prev}} = 5.08$).

Further, gratitude mediated the interactive effect on expressed helpfulness so that gratitude had a positive effect on expressed helpfulness ($\beta = .75$, CI 95% [.63, .87], $p < 001$). Neither review valence (CI 95% [-71, .31], $p = .45$), regulatory orientation (CI 95% [-1.04, .33], $p = .24$), nor their interaction (CI 95% [$-.25$, 1.48], $p = .12$) significantly predicted expressed helpfulness when gratitude was controlled for. The index of moderated mediation ($\beta = 1.53$, CI 95% [.65, 2.49]) indicated that the mediating effect of gratitude was significant. The conditional indirect effect of valence through gratitude depending on regulatory orientation condition provided further evidence (promotion: $\beta = .87$, CI 95% [.17, .1.61]; prevention: $\beta = -.66$, CI 95% [-1.18, $-.15$]). No significant conditional direct effects of valence on expressed helpfulness emerged.

Discussion

Study 2c primed regulatory orientation independently from the product decision. The results replicate previous findings and provide some evidence for the robustness of the proposed effects. Importantly, studies 2b and 2c suggest gratitude as a potential mechanism that influences expressed helpfulness. However, only experimental manipulation of different gratitude levels can shed light on whether higher levels of gratitude are responsible for the increased likelihood of helpfulness voting. So far, the results suggest that when regulatory focus and review valence match, this increases gratitude and the likelihood to vote the review as helpful. If increased gratitude is a central component of expressed helpfulness, reducing gratitude experimentally should also lead to a lower likelihood to vote a review as helpful, even when review valence and regulatory focus match. Thus far, the evidence for the role of gratitude is correlational rather than causal and therefore the effect of the mediator on expressed helpfulness may be overestimated (Bullock et al., 2010). This is problematic because mediation models are sensitive to omitted variables (Imai, Keele, Tingley, & Yamamoto, 2011). For example, one may argue that gratitude is merely a component of expressed helpfulness and that other unobserved processes determine expressed helpfulness. Hence, study 3 manipulates gratitude by changing the way in which the reviewer communicates his reciprocity expectations and thereby tests the mechanism through moderation.

Study 3: Manipulation of Gratitude

Study 3 has two goals. First, experimental manipulation of gratitude levels provides a means to test the causal role of gratitude on helpfulness voting behavior. Second, study 2b forced respondents to choose either "Yes" or "No" as a helpfulness vote. However, many consumers read reviews but do not cast a vote. Therefore, a forced-choice scenario may imply that some of the helpfulness votes stem from demand effects. To alleviate these concerns, in study 3, the voting button was embedded in the review stimulus and the voting decision was therefore voluntary. Further, there is no direct question related to voting, only the button that can be clicked on to cast a vote. The procedure was similar to study 2b, except that the review stimuli were modified to create higher (vs. lower) levels of gratitude towards the reviewer. All other manipulations (review valence and regulatory orientation) remained identical.

Pretest

The pretest assessed whether manipulating the way in which the reviewer communicates his expectations towards the reader's behavior reduced gratitude relative to when the reviewer does not explicitly communicate his expectations. Specifically, the same set of one negative and one positive review now contained an additional sentence where the reviewer either simply stated that she hoped that the review provided useful information (No expectation condition) or the reviewer further elaborated that while she hopes to provide useful information, she also expects readers to give back. The reviewer then specifies that readers may do so by voting the review as helpful (Expectation condition). Eighty-seven graduate students participated in this pretest ($M_{\text{age}} = 26$, 54% male) and evaluated one positive (negative) review with or without explicit expectations. Participants also evaluated the perceived helpfulness of the review. Further, they indicated their level of gratitude using the same set of measures as before. Finally, they also responded to a single-item manipulation check that measured to what extent participants thought that the reviewer expressed expectations towards the reader. All responses were measured on 7-point scales ranging from 1 (not at all) to 7 (very much).

The manipulation check showed that respondents in the expectation condition perceived a higher level of communicated expectations ($M_{\text{Expectation}} = 4.72$, $M_{\text{NoExpectation}} = 3.04$, $F_{1, 85} = 22.82$, $p < .001$). An

ANOVA with expectations (1 = no expectation, 0 = expectation) as the independent variable and gratitude as the dependent variable revealed a main effect of expectations, $F_{1, 85} = 25.6$, $p < .001$). Participants in the expectations condition were less grateful than those in the no expectations condition ($M_{\text{NoExpectation}} = 5.18$, $M_{\text{Expectation}} = 3.19$). An ANOVA with valence (1 = positive, 0 = negative), expectations, and their interaction on gratitude revealed only a main effect of expectations, $F_{1, 83} = 24.28$, $p < .001$. Neither the main effect of valence ($F_{1, 83} = .688$, $p = .41$) nor the interaction were significant ($F_{1, 83} = 1.84$, $p = .18$). The expectation manipulation did not have a significant effect on perceived helpfulness of the review, although the review without expectations was perceived as more helpful ($F_{1, 85} = 2.55$, $p = .11$, $M_{\text{Expectation}} = 4.83$, $M_{\text{NoExpectation}} = 5.43$).

Main Study

The main study was a 2 (expectation: no expectation vs. expectation) × 2 (review valence: positive vs. negative) × 2 (regulatory orientation: promotion vs. prevention) between-subjects design. Two-hundred and eighty-one respondents recruited from MTurk participated in the study in exchange for compensation ($ 0.25). Again, the study included attention and manipulation checks. The study first primed regulatory orientation. Next, respondents received the review stimuli (either one positive or one negative review) that contained either explicit expectations or no expectations and indicated their gratitude ("How thankful do you feel towards the reviewer?," from 1 = not at all to 7 = very much). Finally, participants could express helpfulness through a vote (1 = yes, 0 = no). Please refer to the MDA, Appendix S4 for details on the manipulation of expectations.

Attention and Manipulation Checks

Attention checks included obvious checks ("If you have read this item, please click '1' ") and not-so-obvious checks ("In the past, I have been in an accident that resulted in my death"). Fifty-two participants failed either one or both of the attention checks and were filtered from the sample. This did not have a systematic effect on the distribution of participants across groups. The final sample consisted of 229 participants ($M_{\text{age}} = 36$, 60% male). Out of the 229 remaining respondents, 22 did not vote, 119 voted a review as helpful and 88 voted a review as not helpful. Subsequent analysis was performed on those participants who decided to vote

($N = 207$). Similar to study 2b, the regulatory focus manipulation worked as intended (see MDA, Appendix S4 for details).

The Effect of Reciprocity Expectations on Gratitude

An ANOVA on gratitude revealed a significant effect of reciprocity expectations ($F_{1, 199} = 35.47$, $p < .001$), and a significant interaction between review valence and regulatory orientation ($F_{1, 199} = 27.64$, $p < .001$). Further, the three-way interaction between review valence, regulatory orientation and expectations was significant ($F_{1, 199} = 4.52$, $p = .04$). Specifically, when the reviewer did not state expectations, the interaction between review valence and regulatory orientation was significant ($F_{1, 87} = 23.92$, $p < .001$).

Simple effects analysis provided further evidence for the matching effect. When participants read a positive review, they were more thankful in the promotion condition ($F_{1, 87} = 14.39$, $p < .001$, $M_{\text{Pos\&Prom}} = 6.06$, $M_{\text{Pos\&Prev}} = 4.46$). When they read a negative review, they were more thankful in the prevention condition ($F_{1, 87} = 9.68$, $p < .01$, $M_{\text{Neg\&Prev}} = 5.64$, $M_{\text{Neg\&Prom}} = 4.38$). When the reviewer stated reciprocity expectations, the interaction between review valence and regulatory orientation was also significant but weaker ($F_{1, 112} = 5.65$, $p < .05$). However, simple effects analysis revealed that, while positive (negative) reviews elicited more gratitude in the promotion (prevention) condition, these differences in perceived gratitude were marginally significant for positive reviews ($F_{1, 112} = 3.80$, $p = .05$, $M_{\text{Pos\&Prom}} = 4.26$, $M_{\text{Pos\&Prev}} = 3.58$) and not significant for negative reviews ($F_{1, 112} = 2.05$, $p = .16$, $M_{\text{Neg\&Prev}} = 4.32$, $M_{\text{Neg\&Prom}} = 3.79$).

In sum, when the reviewer did not state any expectations, participants were more thankful. Further, the interactive effect of review valence and regulatory orientation was stronger when no expectations were stated by the reviewer. When respondents read a review that matched their regulatory orientation (i.e., in the promotion/positive or prevention/negative condition), they were more grateful when the reviewer did not state expectations ($M_{\text{NoExpectations}} = 5.81$, $M_{\text{Expectations}} = 4.23$). Figure 4 illustrates the three-way interactive effect on gratitude.

Expressed Helpfulness

First, a binary logistic regression with expressed helpfulness as the dependent variable and review
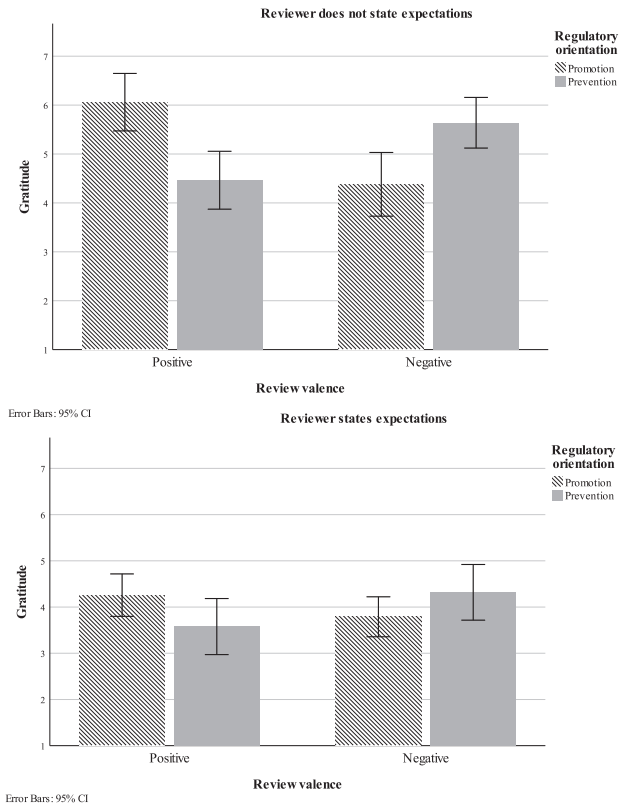
Figure 4. Gratitude when the reviewer does or does not state expectations.

valence, regulatory orientation, reciprocity expectations, and all interactions as the independent variables was estimated (PROCESS, model 3). The results revealed a significant main effect of review valence ($\beta = -1.80$, Wald's $\chi^2 = 7.35$, CI 95% $[-3.10, -.49]$, $p < .01$), and a significant interaction between review valence and regulatory orientation ($\beta = 3.12$, Wald's $\chi^2 = 7.98$, CI 95% $[.96, 5.68]$, $p < .01$). No other significant main effects emerged (p's > .06). Further, while the three-way interaction between review valence, regulatory orientation, and reciprocity expectations yielded the expected effects, it did not reach significance ($\beta = -2.00$, Wald's $\chi^2 = 2.21$, CI 95% $[-4.64, .64]$, $p = .14$). However, an inspection of the two-way interaction between review valence and regulatory orientation in the different expectations conditions showed the expected pattern. Specifically, when the reviewer stated expectations, the interaction was not significant ($\beta = 1.12$, Wald's $\chi^2 = 2.12$, $p = .15$). When the reviewer did not state expectations, there was a significant interaction between review valence and regulatory orientation ($\beta = 3.05$, Wald's $\chi^2 = 5.19$, CI 95% $[-1.68, -.12]$, $p < .05$). Positive reviews

were more likely to be voted as helpful in the promotion condition as compared to the prevention condition (88.2% vs. 46.4%) while negative reviews were more likely to be voted as helpful in the prevention condition as compared to the promotion condition (84.0% vs. 66.7%).

Second, to facilitate the follow-up analysis of the matching effect depending on whether the reviewer stated expectations or not, a binary logistic regression (PROCESS model 1) was estimated with the matching indicator (1 = matching) as the independent variable, expectations (1 = expectations) as the moderator, and expressed helpfulness as the dependent variable. Results revealed a significant effect of matching ($\beta = 1.59$, $p < .01$, Wald's $\chi^2 = 9.09$, CI 95% $[.56, 2.62]$) on expressed helpfulness but no significant main effect of expectations ($p = .22$). Moreover, the interaction between matching and expectations predicted expressed helpfulness, but the confidence interval included zero ($\beta = -1.18$, $p = .07$, Wald's $\chi^2 = 3.32$, CI 95% $[-2.44, .09]$). Further inspection of the conditional effect shows that the effect of matching on expressed helpfulness is significant and positive when the reviewer does not state expectations ($\beta = 1.59$, CI 95% $[.56, 2.62]$), but not when the reviewer does state expectations ($\beta = .41$, CI 95% $[-.32, 1.14]$).

Specifically, when the reviewer stated reciprocity expectations, the probability that respondents where regulatory focus and review valence matched would vote the review as helpful were 53.6% while they were 43.3% when focus and valence did not match. In comparison, when the reviewer did not state any expectations, the probability of receiving a helpfulness vote was 85.7% when the review matched regulatory orientation and 55.1% when the review did not match. Hence, in comparison, stating reciprocity expectations reduced the likelihood that a review received a helpfulness vote (see Figure 5 for an illustration of the results).

The Mediating Effect of Gratitude

To provide further evidence for the notion that increased feelings of gratitude transmit the matching effect between review valence and regulatory orientation and to illustrate that stating expectations weakens this effect (H_3), a mediation analysis was conducted. Similar to the previous studies, a moderated mediation model (model 8) with expressed helpfulness as the dependent variable, the matching indicator as the independent variable, expectations as the moderator, and gratitude as the mediator
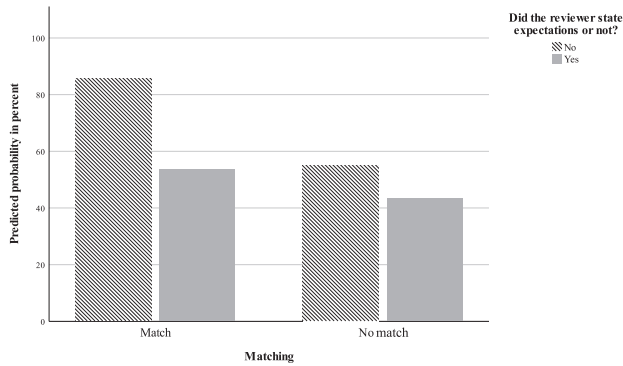
Figure 5. The probability of expressed helpfulness when the review states expectations.

yielded the expected effects. Both matching ($\beta = 1.38$, CI 95% [.83, 1.94], $p < .001$), expectations ($\beta = -.68$, CI 95% [-1.23, $-.13$], $p < .05$) and their interaction ($\beta = -.89$, CI 95% [-1.64, $-.16$], $p < .05$) predicted gratitude. As expected, the effect of matching on gratitude was weaker and not significant in the expectations condition ($\beta = .48$, CI 95% [$-.01$, .98], $p = .06$). More importantly, gratitude mediated the interactive effect on expressed helpfulness so that gratitude had a positive effect on expressed helpfulness ($\beta = .60$, CI 95% [.35, .85], $p < 001$). The index of moderated mediation ($\beta = .54$, CI 95% [-1.14, $-.09$]) indicated a significant mediating effect of gratitude. Specifically, the indirect effect of matching on expressed helpfulness through gratitude was larger when the reviewer stated no expectations (Expectations: $\beta = .29$, CI 95% [$-.01$, .67]; No expectations: $\beta = .83$, CI 95% [.42, 1.43]).

General Discussion

Across five studies the findings suggest that consumers' regulatory orientation and review valence interact to predict expressed helpfulness. More specifically, when consumers operated under a promotion focus or evaluated reviews for a promotion-oriented product, positive online reviews were more likely to receive helpfulness votes. In contrast, negative online reviews received more helpful votes when consumers operated under a prevention focus or evaluated reviews for prevention-representative products (study 1). This interaction was conceptualized as a matching process, where different valence frames are more relevant to different types of regulatory orientation (study 2a). Moreover, feelings of gratitude were found to be the process that

transmits the matching effect onto subsequent voting behavior (studies 2b and 2c). This work provided further evidence for this gratitude-based process through moderation (study 3). A mediation test showed that readers' expressed helpfulness is transmitted through gratitude (study 2b). Replication with a different regulatory orientation manipulation provided support for the robustness of this mechanism (study 2c). Finally, retesting the process through manipulating gratitude showed that readers are less willing to vote a review as helpful when their gratitude towards the reviewer is reduced. Specifically, when the reviewer stated reciprocity expectations, this reduced the likelihood that a review received a helpfulness vote, even when the review matched the reader's regulatory focus (study 3).

In sum, the findings suggest that accounting for consumers' regulatory orientation helps to understand when positive or negative reviews are more likely to receive a helpfulness vote. More importantly, results show that gratitude is an emotion that informs specific predictions in the context of giving and receiving advice, thereby providing a theoretical basis to understand readers' motivation to express helpfulness. These findings contribute to both theory and practice and offer several directions for future research.

Theoretical Contributions

The findings from this research make a contribution to the literature in the following three ways. First, the findings presented in this paper contribute to the literature on online review processing, and, more specifically, helpfulness of online reviews. Prior research has stressed the importance of review helpfulness as the most important proxy for review quality and persuasiveness (Cao et al., 2011; Mudambi & Schuff, 2010; Pan & Zhang, 2011). Most of these studies have focused on aggregate data to illustrate what contributes to helpfulness ratings on a general level. Despite these efforts, it remained unclear in which contexts positive or negative reviews are more helpful. This research utilizes a goal framework to show why some consumers perceive and vote a positive review as helpful, while others behave the opposite way. The findings show that whether or not negative or positive reviews are more likely to receive helpfulness votes can depend at least in part on their regulatory focus. These findings corroborate the existing literature on the relevance of informational cues, such as message frames (Cesario et al., 2013) or advertising

messages (Lee & Aaker, 2004). Further, the findings confirm that the valence of the information also plays a role in conveying relevance. Respondents inferred that negative reviews were more relevant for their evaluation when they operated under a prevention orientation. In addition, this research shows that the interaction between regulatory orientation and review valence not only affects perceived relevance but also has an impact on helpfulness voting.

Second, this paper address an area of online review research that has received little attention: helpfulness voting behavior. It focuses not only on aggregate helpfulness ratings to inform predictions but sheds light on the emotional process that contributes to voting behavior. Helpful advice leads to affective responses such as gratitude. These affective responses are responsible for the decision to reward the reviewer who has invested time and effort to help consumers. This confirms the argument that gratitude is not an automatic response to any advice received, but is specific to helpful advice (Fredrickson, 2004). This research also provides evidence that when gratitude is reduced, this reduces the likelihood that consumers are willing to reciprocate the help received.

Third, this work contributes to the regulatory focus literature by proposing a categorization of different products in terms of their relation to different regulatory orientations. It has been argued previously that consumers tend to organize products into mental categories to facilitate decision-making (Zhou & Pham, 2004). Clearly, not every customer will perceive a product in the same way and situational context may change the regulatory orientation that dominates information processing. However, the large number of reviews online may lead consumers to rely more on broad conceptualizations of goals and product benefits that help them in pursuit of these goals. Hence, they might look at certain products considering prevention concerns, while they look at others considering promotion concerns. These broad categorizations can inform their assessment of review helpfulness and their likelihood to vote positive or negative reviews as helpful.

Practical Implications

The findings presented in this paper have several implications for marketing managers. First, the findings provide potential implications for managers to improve readers' willingness to vote reviews as helpful. For example, review websites could actively try to establish a more grateful mindset in consumers, e.g. by telling them "Have you ever considered all the efforts that reviewers make to provide you with helpful information? Reward them with your helpfulness vote!". Putting consumers in such a mindset could make feeling grateful more salient and thereby increase the willingness to vote a review as helpful. If consumers are more aware that casting a vote for helpfulness (or non-helpfulness) will increase the effectivity of helpfulness as a diagnostic tool, this could both enhance consumers' decision-making and make writing reviews more rewarding for reviewers, encouraging the further generation of consumer opinions. Reviewers, on the other hand, should be more careful when they signal that they feel deserving of gratitude because this may reduce readers' willingness to vote their reviews as helpful.

Second, the findings presented here suggest that companies should be careful when they design product descriptions. Often times, these descriptions appear similar to textual advertisements, for example in magazines or newspapers. They include information about the product's main benefits, contain pictures, and make claims about the product's functionality. This information may influence consumers in conjunction with review information (Chen & Xie, 2008). However, it may also cue a certain regulatory orientation in consumers and can influence subsequent review processing.

Limitations and Avenues for Future Research

Several limitations of the present research can serve as a basis for future investigations and should be considered when judging the value of the findings presented here. First, while a variety of reviews with different content are present in the experimental studies, review content was not explicitly manipulated. However, recent research has given some indication that readers process online reviews with regard to a variety of textual elements (Kronrod & Danziger, 2013; Moore, 2015; Yin, Zhang, & Bond, 2014).

For example, consider a review where the reviewer signals that he or she has invested considerable effort in reviewing a product, for example by comparing it with competing products. Such a review text might lead the reader to feel more grateful towards the reviewer because of the effort and detail that has been invested. While such a review frame might induce higher levels of gratitude, explicitly trying to make readers feel more

grateful and subsequently more likely to vote a review as helpful could also backfire, as shown in study 3. This research provides initial evidence that doing so reduces readers' gratitude, but more detailed insight into how different styles of communication inhibit the development of gratitude is important. In particular, why does stating expectations inhibit gratitude? It could be that a parallel process occurs. Namely, stating expectations of reciprocity may increase feelings of indebtedness (Watkins et al., 2006) or lead to reactance (Pelser et al., 2015). Such feelings may rival consumers' gratitude and thus inhibit helpfulness expression.

Similarly, the role of prior helpfulness votes for a given review could also further inform the current findings. Previous research on helpfulness voting indicates that as reviews receive more helpfulness votes, they become more likely to be considered for additional helpfulness votes (Kuan et al., 2015). More precisely, a review without a prior helpfulness vote is less likely to receive one in the future, while reviews that have already been voted by others are more likely to receive further votes. The findings in study 1 suggest a similar pattern. Thus, prior helpfulness rating might be another determinant that could be of interest for further research. With regard to gratitude, it would seem plausible that readers infer from a reviewer's helpfulness rating whether or not this reviewer has been especially helpful to other users, and therefore potentially more deserving of gratitude.

This research focuses on promotion versus prevention orientation as a moderator of the helpfulness of negative and positive reviews. However, there is some research that relates utilitarian and hedonic qualities of products to different regulatory focus frames (Chernev, 2004). It could be interesting to extend this research and study whether these two concepts interact with regard to review helpfulness. In study 1, both the surveillance camera and the digital camera are typically classified as utilitarian products, but they were not representative of the same regulatory focus. Thus, the current results do not seem to suggest that substantial differences exist but more research in this direction is necessary.

Further, specific content-framing in the review message is not accounted for. This is particularly relevant from the perspective of regulatory fit (Aaker & Lee, 2006). For example, it might be that consumers select which reviews to read based on the compatibility of the specific message content to their regulatory orientation. Then, the effects obtained in this research could be due to the fact that promotion-relevant (prevention-relevant) content is more likely to be presented in a positive (negative) review. Disentangling these relationships would require further research on the interplay between review valence and review content. Specifically, it could be that promotion-framed content in a negative review has similar effects on perceived helpfulness to promotion-framed content in a positive review. The current findings cannot fully address this question. However, the results from study 1 and study 2a seem to suggest that, on average, different types of valence have different relevance depending on regulatory orientation, even when content is not explicitly accounted for. Additional research that incorporates automated text analysis to provide information on the interplay between content-frames and goal orientation could shed more light on this question.

Similarly, approach-avoidance conflicts (Carver, 2006) may play a role in the effects obtained in this research. In particular, one may argue that consumers usually encounter multiple online reviews, both positive and negative reviews. They may read positive reviews to identify the best alternative and negative reviews to avoid making a mistake. While the present research cannot rule out such effects empirically, the independent manipulation of regulatory orientation in studies 2a and 2c suggests that in the context of this research, where consumers have only a very limited set of reviews at their disposal, regulatory orientation also plays an important role. However, approach-avoidance might be of particular interest with regard to sequential decision making. For example, consumers might read negative reviews during the early stages of their purchase decision to filter out the worst alternatives. Later on, they might turn to positive reviews to maximize the probability of buying the best available alternative.

Finally, it is not clear from this research whether regulatory orientation influences which review will be to read or which review is deemed as helpful. As participants only receive a comparatively small number of reviews (six reviews and one review) information overload is not an issue and participants can easily read and evaluate all online reviews. The studies presented here do not shed light on the sequence in which readers process online reviews. This is an exciting avenue for further research. In particular, using eye-tracking or mouse-tracking techniques could shed more light on the sequence in which readers select and evaluate online reviews.

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Appendix S1. Study 1.
Appendix S2. Study 2a.
Appendix S3. Study 2b.
Appendix S4. Study 3
Figure S1. Advertising Stimuli (Studies 2b and 3).