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Born Unequal: A Study of the Helpfulness of User-Generated Product Reviews

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Abstract

Online user-generated product reviews have become an indispensible tool for consumers and thus for retailers who want to attract and retain consumers. Yet, relatively little is known about what causes consumers to find an online peer review helpful to their shopping tasks. Prior research examines mostly the effects of product reviews on consumer product attitude, product choice, and product sales. This paper, however, provides an analysis of the determinants of review helpfulness. In two studies, we examine the effects of review characteristics, product type, and reviewer characteristics on perceived review helpfulness. With data collected from a real online retailer, we provide empirical evidence to support our conceptual predictions. Specifically, both review valence and length have positive effects on review helpfulness, but the product type (i.e., experiential vs. utilitarian product) moderates these effects. Using content analysis of reviews, we develop a measure of expressed reviewer innovativeness (i.e., the predisposition toward new products as revealed in review content). A curvilinear relationship exists between expressed reviewer innovativeness and review helpfulness. These findings lead to pertinent managerial implications.

Keywords: User-generated content; Helpfulness; Product reviews; Content analysis; Virtual communities; Consumer innovativeness

Introduction

The Internet has profoundly transformed the way consumers shop and the way they exchange product consumption experiences (Grewal and Levy 2009). In recent years, a growing number of consumers seek and post product opinions on the Internet. These product opinions, as a new form of electronic word-of-mouth/mouse (eWOM), have become an indispensible tool for consumers and thus for retailers who want to attract and retain consumers. As a response to this new phenomenon, academic studies have examined what leads to eWOM (Hennig-Thurau et al. 2004; Kozinets 1999), and how eWOM affects the business bottom line, including consumer product choice (Gupta and Harris, 2009), purchase intention (Park, Lee, and Han 2007), product sales (Chevalier and Mayzlin, 2006; Dellarocas, Zhang, and Awad 2007; Duan, Gu, and Whinston 2008; Zhu and Zhang 2010), consumer evaluation of websites (Kumar and Benbasat 2006), customer value and loyalty (Gruen, Osmonbekov, and Czaplewski 2005), and the success of new product introductions (Clemons, Gao, and Hitt 2006). Yet, relatively little is known about what makes an online peer review helpful in the eyes of consumers. Given the dearth of work, both academic and industrial researchers call for additional studies in this particular area (Brown, Broderick, and Lee 2007).

As an answer to this call, in this paper, we examine the effects of several important characteristics of review, product type, and reviewer on the perceived helpfulness of an online user-generated product review. The key variable of interest, perceived review helpfulness, is defined as the extent to which a consumer perceives a product review to be useful in performing his/her shopping tasks. In this paper, "helpfulness" and "usefulness" are used interchangeably.

Based on several streams of research (e.g., WOM persuasion, virtual communities, and consumer innovativeness) which we will detail in the following sections, we are led to expect that, in evaluating user-generated reviews of a product, consumers, in general, perceive a positive (long) review to be more helpful than a negative (short) one. The effects of review

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valence and length, however, are moderated by the product type. Specifically, the effect of review valence is more pronounced for experiential than for utilitarian products, whereas the effect of review length is more prominent for utilitarian than for experiential products. Furthermore, a reviewer's expressed innovativeness (i.e., the predisposition toward new products as revealed in the review content) has an inverted-U-shaped effect on the review's perceived helpfulness. That is, the most and the least innovative reviewers are less effective than the moderately innovative reviewers in providing helpful product advice to consumers.

With data collected from a leading online retailer (i.e., Amazon.com), we empirically test our propositions in two studies. In Study 1, based on a dataset that includes over 40,000 reviews of 300 products, we examine the impact of review characteristics and product type on perceived review helpfulness. In Study 2, we treat reviewers as narrators, and, by analyzing what and how a product-related story is told (through the review content), we make inferences about reviewers' virtual presence. Using a content analysis, we develop a quantitative measure of expressed reviewer innovativeness, and examine its effect on the helpfulness of the communicated product advice. Results from both studies provide strong empirical evidence to support our propositions.

Our research attempts to make several important contributions to the literature. First, unlike many prior eWOM studies that analyze the effects of user-generated product reviews from the retailers' perspective (e.g., product choice and sales), we are among the first to examine eWOM usefulness from the consumers' perspective. From this angle, our findings offer unique insights for retailers, policy makers, and consumers. Second, our work extends conventional WOM research (e.g., Higie, Feick, and Price 1987) to a virtual environment, where social ties to WOM communicator—important contextual variables to explain WOM persuasion in the extant literature (Knapp and Daly 2002)—are usually absent. The lack of social ties forces consumers to evaluate eWOM primarily based on the content (Walther 1996). Within this context, we add to the literature by identifying several important content characteristics and a potential moderator that impact eWOM usefulness. In addition, consistent with the view of online ethnography, or netnography (Kozinets 2002), we put forth the notion of virtual presence of an online communicator (i.e., reviewer). We argue that the expressed characteristics revealed by this presence play an important role in influencing the effectiveness of communicated information. We contribute to the literature by combining qualitative and quantitative methods to assess the impact of reviewer innovativeness—an important trait closely associated with product adoption and opinion leadership—on review helpfulness.

The rest of the paper is organized as follows. First, we set forth our research questions and discuss their theoretical underpinnings. We then present empirical findings from two studies. Finally, we discuss the implications of our study and suggest directions for future research.

Conceptual framework and research questions

In this section, we present our research questions and draw on relevant theories to make predictions. In particular, we examine three types of determinants of perceived review helpfulness, including the review characteristics (RQ1), product type (RQ2), and reviewer characteristics (RQ3).

RQ1: What characteristics of a product review affect perceived review helpfulness?

WOM, online or off-line, is a form of interpersonal interaction. In an off-line context, consumers often rely on their social ties to the WOM communicator to assess WOM usefulness. Both close social ties (e.g., family and friends) (Brown and Reingen 1987) and remote ties (e.g., celebrities) (Duhan et al. 1997) can work as important contextual variables in affecting perceived WOM usefulness. In a virtual social environment, reviewers and readers are often strangers. The lack of traditional social ties forces consumers to evaluate message usefulness almost solely based on the content of the communicated message (Walther 1996). In our analysis, we choose to examine two important review characteristics (i.e., valence and length) and their effects on review helpfulness.

Prior research that examines the effects of WOM valence on consumer attitude and behavior has produced rather equivocal results. Some studies report that consumers perceive negative information as more diagnostic and persuasive than positive information of similar intensity (i.e., negativity bias) (e.g., Arndt 1967); while others find quite the opposite (i.e., positivity bias) (e.g., Skowronski and Carlston 1987). Indeed, the effect of WOM valence is rather complex, and may depend on specific conditions. For example, prior studies reporting either negativity or positivity bias have discussed several conditions/moderators including consumers' perceived risk (Arndt 1967), the presentation of WOM (e.g., vividness) (Herr, Kardes, and Kim 1991), the attribution of WOM (e.g., to the product or WOM communicator) (Mizerski 1982), cue diagnosticity of WOM (Skowronski and Carlston 1987), and past agreement with the WOM communicator (Gershoff, Mukherjee, and Mukhopadhyay 2003). Unlike prior research, we focus on a unique condition—consumers evaluate eWOM usefulness a) in the absence of conventional social ties and b) for products that consumers are sufficiently involved with. Under this condition, we argue that positivity bias is likely to prevail.

Consumers are not equally motivated to process product information in different buying situations (Petty and Cacioppo 1979). In an early purchase stage, consumers are usually not committed to a particular product. In order to narrow down product choices, consumers are likely to use various heuristics to simplify product evaluation, and therefore reduce the burden involved in the shopping task. Specifically in the context of online product reviews, consumers may simply rely on the summary statistics of consumer reviews (e.g., the average/highest/lowest product rating, or the number of ratings) or other diagnostic cues (e.g., a strong negative review) to include/exclude products in/from their consideration without systematically processing the content of individual product reviews. By contrast, in the late purchase stage, consumers are

typically involved with a well-defined set of product choices. When consumers are product involved, they are motivated to systematically process product information—reading individual reviews, and then evaluating their usefulness. We argue that the proliferation of product information in an online environment (e.g., popular products usually have numerous reviews) works to intensify this pattern of information processing: systematic processing of individual reviews mostly occurs when consumers are, to some extent, involved with the product(s). In fact, prior research finds empirical evidence that consumers are most likely to systematically process eWOM when they already have buying intentions (Weinberg and Davis 2005). Our research examines individual eWOM usefulness in this specific context.

In processing WOM information, a substantial amount of literature documents the effect of a person's evaluative predisposition toward the target of WOM communication on the receptivity to and interpretation of new information. For instance, Wilson and Peterson (1989) show that a person's evaluative predispositions toward products can affect his/her perception of WOM information. Chatterjee (2001) posits that the evaluation of eWOM depends on a consumer's intent to buy. The stronger a consumer's feelings toward the product prior to exposure to eWOM information, the more these feelings will dominate the interpretation of eWOM. Thus, the perception of eWOM is likely to be selective in that consumers are more sensitive to the information that is consistent with their prior product attitudes and beliefs, and less sensitive to the information that is inconsistent.

In our research context, consumers who are involved enough to evaluate the content of individual reviews are usually those who possess intent to buy, and thus hold some degree of favorable attitudes toward the reviewed product. These product attitudes, however, may be accompanied by uncertainties, which consumers seek to reduce through obtaining information from product reviews. Consumers' favorable product predispositions are likely to bias their interpretation of eWOM. Specifically, positively valenced product reviews, more likely to be congruent with involved consumers' product predispositions, will be perceived as more helpful than negatively valenced reviews. Thus, we expect that, in consumers' evaluations of individual product reviews, a positivity bias is likely to prevail.

In addition to review valence, review length may also matter in review evaluation. Compared to shorter reviews, longer reviews likely contain more information. Tversky and Kahneman (1974) suggest that the mere increase of information for a decision boosts the decision maker's confidence. Research on consumer persuasion posits that the more a message is processed, the more favorable associations to its advocacy are formed (Petty and Cacioppo 1984). Therefore, longer reviews—offering more information and subsequently demanding more cognitive resources to process—may be perceived as more convincing than shorter ones. Additionally, the length of a review may also reflect the reviewer's involvement. The more involved a reviewer is, the more likely he/she will present quality information that aids others' purchase decisions. At the same time, readers' perception of a reviewer's involvement may also influence their evaluations of the review. Taken together, we expect that, compared to shorter reviews, longer reviews of a product are more likely to be perceived as helpful.

RQ2: To what extent does the product type (experiential vs. utilitarian) moderate the effects of review characteristics on perceived review helpfulness?

Utilitarian products are usually bought for their specific functionalities. Consumer judgments of such products tend to be cognitively driven, instrumental and goal-oriented (Strahilevitz and Meyers 1998). In contrast, experiential products represent the hedonic aspect of consumption, and are characterized by an affective experience of aesthetic or sensual pleasure, fantasy, and fun (Hirschman and Holbrook 1982). Consumer evaluations of such products tend to be personal and emotional. Between utilitarian and experiential products, consumers tend to seek and process product information differently (Huang, Lurie, and Mitra 2009).

Due to the nature of utilitarian products, reviews in this category are likely to be factual and objective, reflective of the functionality-driven consumer experiences. On the other hand, experiential reviews are likely to be subjective and emotionally laden, reflective of the underlying consumption experiences that involve, to a great extent, personal taste. The characteristics of experiential reviews may introduce idiosyncratic noises to reviewers' product advice, and thus undermine the overall usefulness of these reviews in informing the readers of the quality of the reviewed products. In a similar vein, Sen and Lerman (2007) report that, when evaluating experiential product reviews, readers tend to attribute reviewers' motivations to reviewer-related rather than product-related factors. Thus, we expect that, compared to utilitarian products, experiential products lead to decreased efficacy in the evaluation of product reviews.

In RQ1, we argue that consumers are likely to exhibit a positivity bias in evaluating the helpfulness of product reviews. Here, we expect that the product type may moderate the effect of review valence on helpfulness. More specifically, we argue that consumers tend to discredit negative reviews to a lesser degree for utilitarian than for experiential products. In relative terms, it is easy for consumers to discredit negative product information that is based on subjective criteria (e.g., a reviewer dislikes a movie because he/she does not like the genre of the movie), but difficult to discount information that is based on objective criteria (e.g., a reviewer reports that a GPS does not pick up signal). Because experiential product reviews tend to contain more subjective and less factual information than utilitarian reviews, we expect that, in the evaluation of product reviews, consumer positivity bias is more pronounced for experiential than for utilitarian products.

Product type may also moderate the effect of review length on helpfulness. For utilitarian products, a long review tends to contain more concrete, product-attribute-based information, conducive to others' assessments of product performance. In contrast, for experiential products, a long review may relate more to personal experiences, and contain more adjectives to express feelings and emotions. Thus, in the eyes of review readers, the utility/helpfulness of a subjective, emotion-laden experiential review perhaps does not increase much as review length increases. Thus, the positive effect of review length on

helpfulness is expected to be more manifest for utilitarian than for experiential products.

RQ3: To what extent do a reviewer's expressed characteristics (revealed in the review content) affect perceived review helpfulness?

Compared to conventional WOM that is usually from known sources, small in number, and either positive or negative, eWOM is anonymous in source, voluminous in quantity, and variable in valence. These marked differences often create a rather common issue for consumers: when using a product review as a potential source of information, consumers need to consider which reviewer's product advice makes the most sense, and the extent to which they agree with the reviewer. We argue that, in addition to review valence and length, some information embedded in the review content may signal certain reviewer characteristics, which in turn influence consumers' evaluations of the communicated product advice. Prior consumer studies offer evidence that message content can influence source perceptions even beyond explicit information about the source's credentials (Ratneshwar and Chaiken 1991). In the context of eWOM, Schlosser (2005) posits that consumers may use the content of product reviews to make inferences about reviewers, and finds supportive empirical evidence from lab experiments. In virtual communities, the absence of conventional social ties and face-to-face interactions, in fact, works to sharpen consumers' perceptual awareness of what information is available for understanding who the message sender is (Tompkins 2003).

Against this background, it is relevant to discuss in greater detail a person's presence in virtual communities. Members of an online product reviewing system form a virtual community, in which they exchange product information, but are physically unknown and unseen to each other. Yet, as Kozinets (1998, p. 366) points out, a virtual community has "a 'real' existence on their participants, and thus have consequential effects on many aspects of behavior." In fact, when generating product advice, a reviewer engages in a personal dialogue with the readers, and therefore creates an impression of being present in the minds of readers (Kumar and Benbasat 2006). As a result, the way this reviewer narrates the story—both the content (e.g., information about the product, consumption situations, product assessment, and reviewer's own characteristics) and the organization of the content—may project a personality or persona online, and thus establish a virtual presence (Tompkins 2003). This virtual presence creates an identity, and to a large extent, defines who the reviewer is in the eyes of other community members. A person's virtual presence, like his/her presence in the real world, may encompass various characteristics. In this paper, we only examine one important characteristic known to be closely related to product diffusion and opinion leadership: consumer innovativeness.

Consumer innovativeness has been the central concept in studies on the adoption and diffusion of new products (Bass 1969; Shoham and Ruvio 2008). It is the "bottom-line characteristic in the diffusion process" (Rogers 2003, p. 268). A product reviewing forum is, in essence, a virtual community, where the reviewers disseminate information of a new product in hopes of leading the readers' opinions, whereas the readers are potential product adopters actively seeking for advice. The fundamental dynamic between these two parties is similar to that between the innovators and followers in a product diffusion process. Thus, like prior work on product diffusion, we also rely on consumer innovativeness to facilitate our discussion of social interaction effectiveness between the reviewers and readers.

Consumer innovativeness, or more specifically reviewer innovativeness in our research context, is a personality trait possessed, to a greater or lesser degree, by all members of a community (Midgley and Dowling 1978). Following the conceptualization of innovativeness by Goldsmith and Hofacker (1991), we define consumer (reviewer) innovativeness as the predisposition to learn about and adopt new products within a specific domain of interest. This personality trait is, however, unobserved. Prior research usually relies on either innovative behaviors (e.g., relative earliness in product adoption, the adoption of multiple innovative products) or self-reported scales to reveal the *intrinsic* innovativeness (Midgley and Dowling 1978; Rogers 1976). By contrast, we examine a reviewer's *expressed* innovativeness through his/her virtual presence. A reviewer's intrinsic innovativeness, unless expressed in his/her communicative acts, is not readily observable to other members of a virtual community. Therefore, a reviewer's virtual presence shapes readers' perception of the reviewer's characteristics and hence source credibility. Having defined the meaning and context of innovativeness, we now discuss the effect of innovativeness on opinion leadership.

Consumers in a market/community posses varied levels of innovativeness. Innovative consumers are sensitive and receptive to information related to innovations, and thus tend to be more knowledgeable about new products than others. These consumers also have the propensity to make "innovative decisions independently of the communicated experience of others" (Midgley and Dowling 1978, p. 235). In the process of product diffusion (a social process often characterized by the interaction between the innovators and followers), innovative consumers serve as an important source of product advice, and thus lead other consumers' opinions (Bass 1969). There is a large body of prior work supporting the argument that innovative people tend to hold opinion leadership roles in a community (e.g., Flynn, Goldsmith, and Eastman 1996; Goldsmith and Hofacker 1991). But this leadership role, as Rogers (2003) points out, also depends on the social distance between the innovators and followers.

The concept of social distance, rooted in the fields of psychology and sociology, generally refers to the degree to which an individual perceives a lack of intimacy with dissimilar individuals (Simmel 1964). Social distance works to separate individuals who are perceived as "insiders" from those as "outsiders" (or "us" from "them"). Prior research shows that when social distance increases, individuals become less motivated to engage in communications (Aquilino 1994), and also less likely to trust the communicated information (Suzuki 1998). In fact, it is believed that the transfer of ideas occurs most effectively between individuals who are alike, and hence with short social distance (Anderson and Alpert 1974). Built on the similar idea, Rogers and Bhowmik (1971) use the terms "homophily/heterophily" to

describe the degree to which pairs of individuals who interact are similar/dissimilar in attributes such as education, occupation, beliefs, personalities, and communication styles. These authors point out that homophily generally facilitates communication, and that heterophily, by contrast, may cause message distortion, delayed transmission, restriction of communication channels. Rogers (2003) further argues that homophilous communication may cause cognitive dissonance, because the communicators' preexisting beliefs may be inconsistent with the communicated messages.

In the context of the diffusion process, Rogers (2003, p. 307) points out "interpersonal diffusion networks are mostly homophilous" in that followers tend to seek information and advice about a new product from near peer innovators who possess a greater degree of innovativeness, but not too much greater. The individuals with the greatest degree of innovativeness tend to be substantially different from others in characteristics such as socioeconomic status and personality traits. This marked heterophily, in effect, hurts these innovators' positions as opinion leaders. In other words, "they are too elite" and thus become the "unrealistic model for the average individual" (Rogers 2003, p. 319).

Taken together, prior research suggests that individuals' innovativeness and their opinion leadership tends to follow an inverted-U relationship. In the context of our study, along the same line of logic, we expect that reviewers whose virtual presence signals a high level of innovativeness are, in general, likely to be opinion leaders in a virtual community and consequently their product advice is likely to be perceived as helpful. But this relationship does not hold for the most innovative reviewers, whose marked differences from other community members lead to a greater degree of heterophily which negatively affects others' judgment of communicated product advice. Thus, we expect the relationship between the expressed reviewer innovativeness and perceived review helpfulness follows an inverted-U-shaped pattern.

Study 1

This study empirically tests our propositions regarding the effects of review characteristics and product type on review helpfulness with data collected from an online retailer. We expect that both review valence and length have positive effects on review helpfulness, but their effects are moderated by the product type (i.e., experiential vs. utilitarian products).

Data

Amazon.com is an appropriate source to collect data for our study. As one of the largest B2C online retailers, Amazon.com hosts one of the most popular forums for user-generated product reviews. To start, a reviewer first uses stars to indicate the overall product assessment, with five stars being the best and one being the worst, and then provides a narrative to explain the assigned stars. Once a review is posted, readers can rate the helpfulness of this review by answering the question: "Was this review helpful to you? Yes or No." Over time, a large volume of product reviews and their helpfulness ratings are posted on Amazon.com.

In addition to its popularity, Amazon.com was purposely chosen based on two specific considerations. First, among the five popular retail websites we considered (Amazon.com, Bestbuy.com, Walmart.com, Dell.com, and Target.com), Amazon.com consistently had the largest number of posted reviews, which enabled us to obtain a large sample. Second, product reviews on Amazon.com did not appear to be heavily censored. Censorship in product reviews may cause systemic data bias. As the review posting policies of online retailers are all purposely vague (e.g., Dell.com states the company "reserves the right to remove or to refuse to post any submission for any reason."), we resorted to one author's extensive experience of posting product reviews on Amazon.com. All the reviews written by this author (including very negative ones) were published on the website. To further alleviate the concern, we obtained a convenience sample of ten Amazon.com reviewers with varied levels of experience. None of these reviewers reported incidents of censorship. Thus, Amazon.com appears to interfere with publishing consumer reviews at a low level.

We collected reviews for both experiential and utilitarian products. For experiential products, we gathered reviews from three categories, namely, music CDs, movie DVDs, and video games. For utilitarian products, we collected reviews from another three categories: consumer electronics (e.g., GPS), computer software (e.g., photo-editing software), and healthcare products (e.g., food supplements). Within each product category, we first identified 50 best sellers, and then collected all the available product reviews for each best seller.

Note that we used a sample of best sellers, as opposed to a sample of randomly selected products. This choice was made for two reasons. First, as prior studies also observe, product reviews heavily concentrate on popular products (Chevalier and Mayzlin 2006). Therefore, products chosen at random are likely to have scant reviews and even fewer review helpfulness ratings. Second, collecting product reviews from a random sample of products is, in effect, using stratified random sampling, which gives more representation to products but less to user-generated reviews. Drawing a simple random sample of all published reviews is, however, extremely difficult. Given these considerations, the reviews of 50 best sellers reasonably represent the population of available reviews in a product category.

For each review in our sample, we gathered information on the following variables. (1) *The number of available reviews of a product*: the number of posted reviews for a product at the time of data collection. (2) *Age of a review*: time elapsed (in days) since the date on which a review was posted. (3) *Customer rating:* the number of stars a reviewer gives as the overall assessment of the product. This variable captures the valence of the review content. Reviews with more stars are assumed to be more positively valenced than those with fewer stars. (4) *Review length*: the number of typed characters in a product review. (5) *Product type*: a dummy variable with 1 and 0 indicating experiential and utilitarian products, respectively. (6) *The number of consumers who found a product review helpful*. (7) *The total number of consumers who have rated the review*. The last two measures capture

Table 1
Summary statistics.

	Experiential products	Utilitarian products
Average stars	4.29 (1.18)[a]	3.89 (1.45)
# of helpfulness ratings per product review	6.28 (24.07)	12.20 (30.38)
Number of typed characters per product review	763.04 (1017.06)	847.58 (983.06)
Average life time of a product review (in days)	328.98 (443.34)	185.24 (216.08)
% of product reviews not rated in helpfulness	31.29%	14.85%
Total number of product reviews in our data	31893	9512
Total number of helpfulness ratings in our data	200528	116084
% of product reviews with one star	6.34%	14.83%
% of product reviews with two stars	4.74%	5.33%
% of product reviews with three stars	7.17%	6.30%
% of product reviews with four stars	16.72%	22.71%
% of product reviews with five stars	65.04%	50.83%

[a] Standard deviations are reported in parentheses.

the proportion of review readers who have found a particular product review helpful for their shopping tasks.

Our data collection effort resulted in 41,405 product reviews. Table 1 presents the summary statistics of the data. For both experiential and utilitarian products, customer product ratings are distributed more toward the positive end, with an average rating of 4.29/5.00 and 3.89/5.00 respectively. On average, an experiential product receives 212 reviews, whereas a utilitarian product receives 63 reviews. For experiential products, each product review has an average of 6.28 ratings on review helpfulness, whereas the mean increases to 12.20 for utilitarian products. Thus, our data suggests that more consumers post reviews for experiential than for utilitarian products, but fewer readers evaluate reviews for experiential than for utilitarian products. A fraction of product reviews in our sample (i.e., 14.85 percent for utilitarian and 31.29 percent for experiential products) have not been rated by readers on helpfulness.

The model

The proportion of consumers who found a particular review helpful is the aggregate outcome of consumers' binary answers ("Yes" or "No" to the question "Was this review helpful to you?"). Thus, the number of consumers rating a review as helpful follows a Binomial distribution. A logistic model is appropriate to analyze this type of binomial response data (Greene 2003, p. 686). Both the effects of review characteristics and product type were incorporated into our model. In addition, because our data were gathered from 300 products across several product categories, the variability across product categories or even across products should be accounted for. Thus, we fitted a mixed effects logistic model with a random intercept. Mathematically, our model can be described as:

$$Y_{ijk} \sim \text{Binomial}(n_{ijk},\ \pi_{ijk})$$

$$\ln\left[\frac{\pi_{ijk}}{1-\pi_{ijk}}\right] = (\alpha + u_i) + \chi'_{ijk}\beta \quad (1)$$

where Y_{ijk} refers to the number of consumers who found review k of product j in product category i to be helpful; n_{ijk} is the total number of consumers who have rated this review; π_{ijk} is a Binomial distribution parameter and defines the probability that this review is found as helpful by consumers; α denotes the intercept; χ'_{ijk} is the transposed vector of independent variables; β denotes the vector of parameters to be estimated; and u_i is a random component that varies by product category. u_i is assumed to follow a probability distribution of $N(0, v^2)$. The variance (v^2) of u_i estimates the degree of heterogeneity across product categories in the population. When u_i in Model 1 is replaced with u_j, the modified model (Model 2) estimates a random intercept that varies by product. Both Models 1 and 2 belong to the class of logistic-normal models (Agresti 2002, p. 496).

In the process of model development, we included in the χ vector the following independent variables: Number of available reviews of a product, Age of a review, Age of review^2, Customer rating, Review length, Product type, Product type × Customer rating, and Product type × Review length. Among these variables, Customer rating, Review length, Product type, and their interaction terms are of key interest; the rest are control variables. As discussed earlier, each product category, or even each product, may possess some unique and unobserved characteristics that affect review helpfulness in the eyes of review readers. Thus, two slightly different models are presented: Model 1 accounts for the effects of product-category-level heterogeneity (u_i), and Model 2 accounts for the effects of product-level heterogeneity (u_j). The estimates for the variance of the random component in Models 1 and 2, are both statistically significant ($v^2 = 0.05$, $p = 0.08$ in Model 1; $v^2 = 0.35$, $p < 0.01$ in Model 2), indicating there is a considerable degree of heterogeneity in our data at both the product category level (u_i) and the product level (u_j). However, heterogeneity is greater ($v^2 = 0.35$ vs. $v^2 = 0.05$) and more statistically significant ($p < 0.01$ vs. $p = 0.08$) at the product level. It is important to note that our key interest lies in examining the fixed effects of other parameters (e.g., the effects of review valence and length) rather than category/product heterogeneity. Thus, Model 2, accounting for a larger amount of heterogeneity than Model 1, appears to be the preferred model. Model goodness-of-fit statistics (e.g., AIC) also favor Model 2 over Model 1. Taken together, we focus on Model 2 to interpret our findings. The parameter estimates for key variables from Models 1 and 2 are, however, not substantially different. This consistency in our key results indicates the robustness of our findings. The results of both Models 1 and 2 appear in Table 2.

Table 2
Results of Study 1.

Variables	Model 1	Model 2	Model 3
Intercept	−0.20	0.23***	0.56***
	(0.14)[a]	(0.07)	(0.16)
# of reviews of a product	−0.0002***[b]	−0.00036**	−0.00037**
	(0.00002)	(0.00015)	(0.00015)
Age of review (in days)	0.001***	0.0002**	0.0002**
	(0.00005)	(0.00008)	(0.00008)
Age of review^2	−2.57E−7***	−1.95E−8	−2.03E−8
	(1.98E−8)	(2.55E−8)	(2.86E−8)
Customer rating (in stars)	0.23***	0.20***	0.19***
	(0.008)	(0.008)	(0.008)
Review length (in # of characters)	0.00035***	0.00038***	0.00038***
	(0.00001)	(0.00001)	(0.00001)
Product type[c]	−1.64***	−1.75***	−1.79***
	(0.19)	(0.09)	(0.09)
Product type × Customer rating	0.24***	0.26***	0.26***
	(0.01)	(0.01)	(0.01)
Product type × Review length	−0.00007***	−0.00008***	−0.00008***
	(0.000015)	(0.000014)	(0.000014)
Review disagreement	n.a.	n.a.	−0.26**
			(0.11)
Variance of the random component	0.05*	0.35***	0.35***
	(0.04)	(0.036)	(0.036)
Random component	u_i (varies by product category)	u_j (varies by product)	u_j (varies by product)
AIC	128884.7	127469.1	127450.8
BIC	128884.3	127476.5	127458.1
−2 Log Likelihood	128880.7	127456.1	127446.8
df	10	10	11
Solutions for random effects (only reported for Model 1)	Music CDs	Movie CDs	Video games
	0.09	−0.16	0.06
	(0.14)	(0.13)	(0.13)
	Consumer electronics	Healthcare products	Computer software
	−0.34**	0.15	0.19
	(0.14)	(0.14)	(0.14)

[a] Standard deviations are reported in parentheses.
[b] *Significant at 10% level; **significant at 5% level; ***significant at 1% level.
[c] 1: experiential vs. 0: utilitarian product.

Results

According to Model 2 in Table 2, the coefficient estimate for *Customer rating* ($\beta = 0.20$, $p < 0.01$) suggests that all else being equal, positive reviews have a greater probability of being rated as helpful than negative ones. Thus, our data reveals a positivity bias in the relationship between review valence and helpfulness. We also find that longer reviews are considered to be more helpful than shorter ones ($\beta = 0.00038$, $p < 0.01$), supporting our prediction. Additionally, the estimate for *Product type* ($\beta = -1.75$, $p < 0.01$) indicates that reviews for experiential products are, on average, perceived as less helpful than those for utilitarian products, confirming our prediction that there is a product type effect. This product type effect is also partly evidenced by the lack of consumer interest in evaluating product reviews for experiential products. In our data, the percentage of reviews that have not been rated on helpfulness by consumers is 31 percent for experiential products, about twice as large as that for utilitarian products (15 percent).

In addition, our data analysis indicates that product type moderates the relationship between review valence and helpfulness. The coefficient estimate for the interaction term (*Product type* × *Customer rating*) is 0.26 ($p < 0.01$). Given the dummy variable coding (1 for experiential and 0 for utilitarian prod-

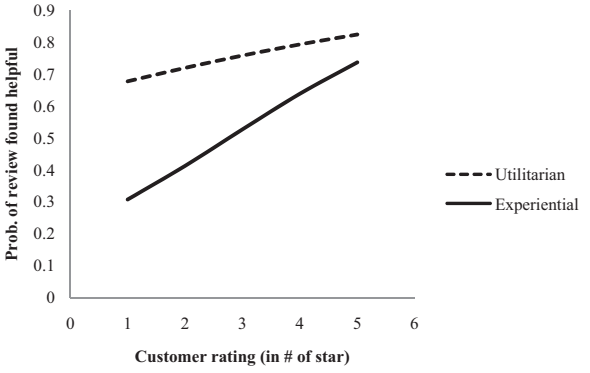

Fig. 1. The interaction between review valence and product type.

ucts), the interaction effect can be decomposed into two simple effects: (a) the effect of *Customer rating* for experiential products (0.20 + 0.26 = 0.46), and (b) the effect of *Customer rating* for utilitarian products (0.20). The difference between these two simple effects (0.47 vs. 0.20) suggests that the positivity bias is more pronounced (i.e., a steeper slope in the relationship between review helpfulness and valence) for experiential products than utilitarian products. This interaction effect is graphically depicted in Fig. 1, when other variables are held constant at their mean levels (*Number of available reviews of a product* = 134, *Age of review* = 296, and *Review length* = 782). In this figure, as the customer rating decreases, the probability of a review being found helpful also decreases. This downward trend is present for both product types, but is more pronounced for experiential products. Different values in other variables (e.g., *Review length*) only move the two lines in Fig. 1 in the same direction, but do not change their interaction. The random component (u_j) does not affect this interaction either.

Our results also suggest that the product type moderates the effect of review length on helpfulness ($\beta = -0.00008$, $p < 0.01$). More specifically, although longer reviews are generally more helpful than shorter ones, a length increase for utilitarian product reviews brings more utility in the eyes of review readers than the same change would for experiential reviews. Thus, the positive effect of review length on helpfulness is more manifest for utilitarian than for experiential products. The effect of this interaction has a smaller size than that of the interaction between product type and review valence.

In terms of the control variables, our analysis reveals that, when a product has a large number of available reviews, the abundance of product information appears to dilute the usefulness of any single review ($\beta = -0.00036$, $p = 0.02$). Alternatively, when a product has a small number of reviews, the scarcity of information elevates the importance of each available review. Intuitively, when there are only a handful of product opinions, each opinion may bring new information, and thus matters to consumers. When the number of opinions increases, an additional opinion likely brings only marginal information, and thus is not particularly important to consumers. In this sense, one review's perceived helpfulness also depends on the context in which this review is situated (e.g., the availability of other reviews). A related question is what if the reviews of a product disagree with each other. In our analysis, we attempted to control for this effect by including a new variable *Review disagreement*—operationalized as the standard deviation of a product's available customer ratings. This new variable, in essence, captures the variability in product opinions. Model 3 (also reported in Table 2) includes this new variable.

As shown in Table 2, model estimates of Model 3 are very consistent with those of Model 2. Coefficient estimate for *Review disagreement* ($\beta = -0.26$, $p = 0.02$) suggests that there is a negative relationship between a review's perceived helpfulness and the disagreement among available reviews. We suspect that this negative effect occurs because review disagreement brings uncertainty to any particular product advice, and thus reduces its usefulness. It is important to note that how consumers react to uncertain information is rather complex, and may depend on specific conditions (West and Broniarczyk 1998). Our analysis does not focus on review disagreement, but only intends to control for its effect.

Study 2

The findings of Study 1 provide empirical evidence for the proposed effects of review characteristics and product type on perceived review helpfulness. In Study 2, we analyze how reviewer innovativeness impacts perceived review helpfulness. The underlying rationale is that, in a product review, the way a reviewer elaborates on his/her product opinion projects his/her virtual presence to members of the online community. This virtual presence, in turn, influences the perceived helpfulness of the communicated information. In this study, we use a content analysis to examine the review content, and make inferences about a reviewer's expressed innovativeness. Study 2 supplements Study 1 by replicating the results of Study 1, and, more importantly, by showing that a reviewer's expressed characteristics also affect the helpfulness of his/her product advice.

Content analysis

Unlike Study 1 which includes only quantitative measures, Study 2 builds upon a qualitative analysis of the review content, which, as suggested by prior research, may generate insights beyond what can be explained by purely quantitative measures (Pavlou and Dimoka 2006). When analyzing the content of a review, we systemically identified the information that might signal the reviewer's trait of innovativeness. Using the method of content analysis, we developed a quantitative measure of the reviewer's expressed innovativeness. Although there are existing instruments to measure consumer innovativeness, such as personality scales (Baumgartner and Steenkamp 1996; Goldsmith and Hofacker 1991; Raju 1980) and the cross-sectional method (Midgley and Dowling 1978), these instruments are survey-based and not designed to account for people's expressed innovativeness in a virtual environment where the identities of communicators are hard to discern and the administration of self-designation surveys is nearly impossible. Instead, consistent with the view of netnography (Kozinets 2002), we suggest that a close analysis of a reviewer's communicative acts may inform us of important traits of the reviewer. This observation-based approach is naturalistic and unobtrusive—a unique combination not found in other research methods (Kozinets 2002).

The coding items in our content analysis are built upon a well-established body of literature on innovator characteristics (e.g., Dickerson and Gentry 1983; Gatignon and Robertson 1991; Rogers 2003; Uhl, Andrus, and Poulsen 1970). After a nearly exhaustive literature review of over 1,000 studies across thirteen disciplines, Rogers (2003) expertly summarizes a total of 24 attributes that are expected to be closely associated with innovators. These attributes are largely grouped into three categories: socioeconomic characteristics (e.g., education and social status), personality traits (e.g., rationality and attitude toward change), and communication behaviors (e.g., exposure to mass media communications and knowledge of innovations). For each

attribute, innovators and followers are expected to exhibit different patterns. Upon a close examination of these attributes, we identified 21 attributes that were most relevant to the context of our research, and adapted these attributes to the coding scheme of our content analysis (see Appendix A for the coding scheme). In the analysis of the review content, we went through all 21 attributes, and coded "1" if an attribute was present in the content, and coded "0" otherwise. We then summed across these attributes, and used the composite score as the quantitative measure of expressed reviewer innovativeness.

It is important to note that our content analysis, by no means, constitutes a measurement scale of consumer innovativeness. A simple composite score (i.e., unweighted sum across various attributes) from our content analysis ignores the fact that some attributes may be more vivid and/or diagnostic than others to signal reviewer innovativeness in the eyes of review readers. Yet, in light of the unique nature of online social interaction, as discussed earlier, the content analysis, with its caveats and limitations, represents a meaningful step toward a better understanding of consumer identity in virtual communities—an increasingly relevant issue as the Internet continues to change how we interact with others.

Data

In this study, we chose to collect reviews from two particular products listed on Amazon.com: a Wii video game (a representation of experiential products) and a digital camera (a representation of utilitarian products). The choice of these two products was made on the basis of several considerations. First, we aimed to collect consumer reviews for products that were close to or had reached the end of their life cycles. One goal of our data collection was to capture as much variability in the review content (and in the projected reviewer traits) as possible. Therefore, the products that, throughout their entire life cycles, had been reviewed by a variety of consumers were preferred choices. The two products selected in this study had both seen their replacement/upgrade products in the market at least one year before our data collection, and thus met the above criterion. Second, we attempted to amass reviews for an experiential and a utilitarian product with similar and manageable sample sizes. Because a detailed analysis of the review content takes a considerable amount of time, products with over 300 reviews were not considered. Third, one of the authors had posted as well as evaluated reviews for products similar to these two products on Amazon.com. The familiarity with the product categories and the participative experience in the virtual community enhances interpretative accuracy and depth in content analysis (Kozinets et al. 2010).

These considerations resulted in a dataset of 490 product reviews, with 209 reviews from the video game, and 281 reviews from the camera. Similar to Study 1, we gathered review-specific information for variables such as *Customer rating* and *Review length*. In addition, for each product review, our content analysis produced a composite score as an estimate for the reviewer's expressed innovativeness. To reduce noise in this measure, two coders independently analyzed the content of each product review. Before final coding, both coders went through several training sessions. During each session, these coders analyzed 50 product reviews (half for an experiential, and the other half for a utilitarian product). At the end of each session, coders discussed and resolved the differences in their coding. When necessary, the coding scheme was modified to add clarity to item definitions. After several rounds, the coders then proceeded to independently code the final sample. None of the product reviews in this sample were used in the training sessions.

In the content analysis of our final sample, the analyses of inter-coder reliability show relatively high agreement between the two coders. Raw percentage agreement ranges from 86 percent ("empathy") to 100 percent (e.g., "identification with a large organization") across attributes, indicating a good to perfect agreement. Cohen's kappa ranges from 0.71 ("attitude toward science") to 1 (e.g., "identification with a large organization"), all above the desired level of 0.70 (Kolbe and Burnett 1991). Disagreements were resolved through discussion.

Results

We analyzed the data using a logistic regression model very similar to the one used in Study 1. The key difference was the inclusion of two new variables, *Reviewer innovativeness* and (*Reviewer innovativeness*)^2. Another technical difference was the exclusion of the random effect component (u), which became unnecessary when we only included reviews from two particular products. Overall, the use of a similar model specification allows us to replicate many findings of Study 1, with a different and much smaller sample. The results of this study appear in Table 3.

As shown in Table 3, most effects related to review valence and review length are consistent with those in Study 1. We continue to observe a positivity bias in the relationship between review valence and helpfulness ($\beta = 0.41$, $p < 0.01$), and a positive relationship between review length and helpfulness ($\beta = 0.0003$, $p < 0.01$). Additionally, product type moderates the relationship between review valence and helpfulness ($\beta = 0.44$, $p < 0.01$), suggesting a more pronounced positivity bias for experiential than for utilitarian products. The interaction between product type and review length, though in the hypothesized direction, is not significant ($p = 0.39$).

The focus of Study 2 is on the reviewer effect on review helpfulness. In Table 3, both *Reviewer innovativeness* and (*Reviewer innovativeness*)^2 are statistically significant. According to the parameter estimates ($\beta = 0.62$ for *Reviewer innovativeness*, and $\beta = -0.03$ for *Reviewer innovativeness*^{2}), there appears to be an inverted-U-shaped relationship between expressed reviewer innovativeness and review helpfulness, suggesting that the least and the most innovative reviewers (innovativeness trait expressed in the review content) are less effective than the moderately innovative reviewers in communicating product advice. When other variables are held at their mean levels, this relationship is graphically depicted in Fig. 2.

Table 3
Results of Study 2.

Variables	Data of particular products: one video game and one camera	Replication study: data of a random sample of products
Intercept	−3.43***[a] (0.23)[b]	−1.48*** (0.45)
Customer rating (in stars)	0.41*** (0.026)	0.28*** (0.04)
Review length (in # of characters)	0.0003*** (0.00005)	0.0002*** (0.00007)
Product type[c]	−1.30*** (0.26)	−1.87*** (0.35)
Product type × Customer rating	0.44*** (0.066)	0.25*** (0.08)
Product type × Review length	−0.0001 (0.00014)	−0.0002* (0.0001)
Reviewer innovativeness	0.62*** (0.07)	0.75*** (0.18)
Reviewer innovativeness^2	−0.03*** (0.006)	−0.08*** (0.019)
Variance of the random component	n.a.	0.48*** (0.12)
Random component	n.a.	u_j (varies by product)
AIC	1641.8	1811.2
BIC	1645.6	1817.5
−2 Log Likelihood	1639.8	1807.2
df	8	9

[a] *Significant at 10% level; **significant at 5% level; ***significant at 1% level.
[b] Standard deviations are reported in parentheses.
[c] 1: experiential vs. 0: utilitarian product.

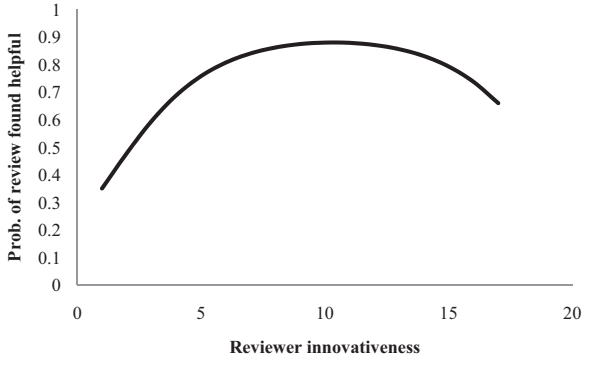

Fig. 2. The effect of expressed reviewer innovativeness on perceived review helpfulness.

As a close-up analysis of the effect of reviewer innovativeness, we also examine whether this effect differs across product types. Consequently, we include the interaction terms, *Product type × Reviewer innovativeness* and *Product type × Reviewer innovativeness*^{2}, into our model. Parameter estimates for these interactions ($\beta = 0.44$, $p = 0.16$ and $\beta = -0.04$, $p = 0.24$) fail to yield statistically significant effects. Therefore, these interactions are not included in the final model. Furthermore, a split-sample analysis (i.e., fitting statistical models to the data consisting of experiential or utilitarian products only) reveals a significant inverted-U-shaped relationship between reviewer innovativeness and review helpfulness for each product type. Taken together, reviewer innovativeness, as expected, has a substantial effect on the perceived review helpfulness. Additionally, reviewer innovativeness appears to function in a rather similar fashion (i.e., curvilinear) for both experiential and utilitarian products.

Replication of results

It is important to note that the above findings are based on two particular products. The use of particular products to represent the more general product types (experiential and utilitarian products) may raise the issue of product representativeness. In order to address this issue and cross-validate our findings, we examined an additional sample of product reviews. More specifically, we drew a simple random sample of 300 reviews for experiential products and another 300 reviews for utilitarian products from the collected product reviews in Study 1, which had a coverage of 300 different products across six product categories.

Table 4
Summary of research propositions and empirical findings.

Research propositions	Study 1	Study 2
Review valence and perceived review helpfulness have a positive relationship (i.e., positivity bias).	Supported	Supported
Review length and perceived review helpfulness have a positive relationship.	Supported	Supported
Compared to utilitarian products, experiential products lead a decreased efficacy in the evaluation of product reviews.	Supported	Supported
The positivity bias of review valence is more pronounced for experiential than for utilitarian products.	Supported	Supported
The positive effect of review length on helpfulness is more prominent for utilitarian than for experiential products.	Supported	Supported by one of two datasets
Expressed reviewer innovativeness (revealed in virtual presence) and perceived review helpfulness have an inverted-U-shaped relationship.	Not studied	Supported

This random sample of product reviews should produce more generalizable results.

With this new sample of product reviews, an additional content analysis was conducted to assess reviewer innovativeness. Because the reviews in this sample came from various products, the coders spent a significant amount of time to familiarize themselves with the involved products before the content analysis to ensure interpretative accuracy. After that, the content analysis was completed, and the data was analyzed in a model similar to the one presented earlier in Study 2. A technical difference is the consideration of between-products heterogeneity. Consequently, we fitted a mixed effects model with a random component, u_j, to account for product-level heterogeneity. The estimate for the variance of this random component is statistically significant ($p < 0.01$), indicating a considerable amount of heterogeneity among products in our data. Results of this analysis are reported in Table 3.

As shown in Table 3, effects related to review valence, length, and their interactions with the product type are all consistent with those derived from the data of the two particular products, with only one noted exception—the interaction between product type and review length is now statistically significant at the 10 percent level ($\beta = -0.0002$). This finding offers more evidence, in addition to what is found in Study 1, for our conceptual predictions.

The effects of expressed reviewer innovativeness on review helpfulness are also consistent with those reported earlier, lending additional support to the proposed curvilinear relationship. The analysis of the effects of reviewer innovativeness across product types again fails to detect a statistically significant difference, with parameter estimates for the two interaction terms, *Product type* × *Reviewer innovativeness* and *Product type* × *Reviewer innovativeness*^{2}, being -0.20 ($p = 0.66$) and -0.02 ($p = 0.72$) respectively. A split-sample analysis reveals a significant inverted-U-shaped relationship between reviewer innovativeness and review helpfulness for each product type.

In summary, in Study 2, results from two distinct datasets are generally consistent, lending great confidence to our findings and conclusions. In addition, most findings in Study 2 concur with those in Study 1, with minor difference in the "*Product type* × *Review length*" interaction. Taken together, these empirical results strongly support our conceptual propositions—in the eyes of review readers, review characteristics, product type, and expressed reviewer characteristics all appear to play a role in determining perceived review helpfulness.

Conclusions and implications

Discussion and conclusions

Table 4 summarizes our propositions and findings. In two studies, our empirical analyses consistently confirm a positive relationship between review valence/length and perceived review helpfulness. The positivity bias related to the effect of review valence is rather counter-intuitive. We argue that this bias is largely attributed to the context of eWOM where user-generated reviews are often large in number and variable in valence. Consumers, who are involved enough to systematically process individual reviews (as opposed to the aggregate information across reviews), likely possess some purchase intent and favorable product predispositions, which may interfere with consumer information processing by eliciting a confirmatory bias. Will such positivity bias always prevail in consumer evaluation of user-generated product reviews? Not always, of course. For instance, consumers sometimes are forced to make sub-optimal product decisions, when product options are limited (e.g., in oligopoly markets). As a result, consumers' consideration set may include unfavorable product options. Under such circumstances, consumers' unfavorable product predispositions may in fact elicit a negativity bias. In addition, consumers' personality traits (e.g., risk taking vs. risk averse) and the intended consumption goals of a product (e.g., a prevention vs. promotion goal that consumers intend to achieve through product consumption) may all cause consumers to exhibit different biases in information processing (see, for example, Zhou and Pham 2004). Thus, caution should be exercised when generalizing our findings.

Both studies suggest that experiential products lead to a decreased efficacy in the evaluation of product reviews, a finding consistent with prior research conducted in controlled experiments (e.g., Xia and Bechwati 2008). The product type (i.e., experiential vs. utilitarian products) is also found to interact with review valence and length in determining perceived review helpfulness. The interaction with review length is empirically supported in Study 1, and partially confirmed in Study 2. In an attempt to compare the composition of the two types of reviews, an analysis of a random sample of 400 product reviews shows that, on average, 8.4 percent of words in an experiential review are adjectives, whereas 7.1 percent of words in a utilitarian review are adjectives. This difference ($F = 6.26$, $p < 0.01$) in the use of adjectives—words often used to express personal feelings and emotions, and thus not most generalizable to other people or situations—in part explains why adding extra words in an experiential review would not return as much utility/usefulness as the same number of words would in a utilitarian review. It is important to note that the two product types discussed here are rather general, and may indeed include a large variety of products, ranging from music CDs (or computer software) to vacation packages (or a home appliance). Differences in product attributes and buying situations may confound our findings (e.g., when buying a particularly important product, consumers may show heightened sensitivity to certain information). Our research, like any other prior research, is a simplification of the real world. Our findings are therefore most relevant to the situations where products in evaluation are similar to those examined in our studies.

Perhaps the most interesting finding of this research is the curvilinear relationship between the expressed reviewer innovativeness and perceived review helpfulness. This relationship, though outlined in the prior literature on consumer social interactions (Rogers 2003), has not been empirically tested in virtual communities. Without a readily applicable instrument, we used

a content-analysis-based approach to quantifying a reviewer's innovativeness revealed in his/her virtual presence. This method is particularly meaningful in the context of virtual communities where a person's presence is, to a large extent, determined by his/her communicative acts (Kozinets 2002). The challenge, as with every new research field, would be to continue to refine the evaluative items of our content analysis in future research. Doing so would also allow replication of research across various domains of interest and nuanced analysis of the effect of innovativeness in these domains (e.g., different media of eWOM).

Managerial implications

Today's consumers, empowered by the Internet, can easily share user-generated product information in virtual communities. For online retailers, such communities can be instrumental in building customer loyalty (Srinivasan, Anderson, and Ponnavolu 2002). As an increasingly popular forum enabling C2C content sharing, the product-reviewing system can be used strategically both to enhance consumer shopping experience and to increase firm profitability. For example, during 2007–2010, Amazon.com went through several sequential changes in how to present user-generated reviews to consumers. The firm initially presented reviews according to their recency, then valence, then importance from the firm's perspective (called "spotlight reviews"), and recently consumer-rated helpfulness. Our findings help explain why some reviews are perceived to be more helpful than others, and thus provide a better understanding of firms' intuitive effort in eWOM management and the effects of such effort.

For instance, our analysis reveals that consumers tend to rate positive reviews to be more helpful than negative ones. This positivity bias, often manifested by inflated helpfulness ratings for positive reviews, may misguide consumers who, often confined by time and effort, focus only on the reviews that have been labeled as helpful. Companies' efforts to highlight the most helpful reviews may further amplify the effect of this bias. Thus, it is important to bring negative reviews to the attention of prospective consumers. In practice, we suggest that consumer affairs policy makers and/or trade associations should develop guidelines regarding how e-retailers present user-generated product information. For example, at a minimum, companies should not censor negative reviews. In addition, in the spirit of providing unbiased information, e-retailers should be encouraged to strategically highlight negative reviews, even when they are not rated by users as most helpful. Recently, several e-retailers started to present the most helpful positive reviews side by side with negative reviews for select products. Such practice should help consumers make more informed buying decisions. This implication may be particularly relevant to those retailers who carry competing brands in a category. For these retailers, their goals are to maximize sales across brands/categories. The loss of sales from one particular brand may not be a major concern. Thus, offering unbiased information to consumers enhances their shopping experiences, which, in turn, may help retailers achieve their long-term financial goals.

Our research also sheds light on how to solicit helpful user-generated content. For decades, consumers with innovativeness traits have been sought after by marketers, as these consumers tend to lead others' opinions in the process of product diffusion (e.g., Higie, Feick, and Price 1987). In a virtual environment, innovativeness traits are revealed by what and how people communicate to others in the community. Thus, the expressed innovativeness, as opposed to intrinsic innovativeness, matters most to the effectiveness of eWOM. The significance of virtual presence makes it critical for retail websites to carefully develop review writing guidelines in order to help reviewers present their product advice effectively. Recently, a handful of websites (e.g., Eopinions.com) started to offer basic guidelines to reviewers (e.g., discuss both pros and cons). For these visionaries, our research presents an opportunity to refine their guidelines. We find that, in addition to product-related content, the information concerning a reviewer's socioeconomic, personality, and communication characteristics all affects perceived review helpfulness. For the majority of retail websites, our research advocates the importance of developing certain review guidelines or structures (e.g., standardized survey questions about reviewer characteristics) to systematically solicit information that may help establish a reviewer's virtual presence, and thus enhance the effectiveness of communicated product advice.

Indeed, reviewers may have very different motivations to spread eWOM online (e.g., venting negative feelings, concern for others, social benefits). Yet, prior research has identified social benefits as the most important reason for reviewers to participate in eWOM creation (Hennig-Thurau et al. 2004). Many reviewers, often those who are most active in eWOM communities, seek other members' approval in social interactions (e.g., a product advice rated by others as helpful) and view others' recognition as a form of compensation that provides "social interaction utility" to motivate further contributions (Balasubramanian and Mahajan 2001, p. 126). Our research offers interesting implications for these social-utility-focused reviewers. For instance, our results suggest that reviewers' effort in writing experiential reviews often returns less utility from the community than the same effort would in the case of utilitarian reviews. Thus, those reviewers seeking to maximize their social utility and/or obtain leadership roles in eWOM communities should perhaps allocate their resources strategically. In addition, for those involved eWOM communicators, presenting too little or too much information that signals reviewer innovativeness can all harm their opinion leadership. Here, moderation is the key. For retail executives, such understanding presents opportunities to design a system that stimulates social interactions. For example, a reviewer ranking system may add visibility to social compensation. In addition, creating room for reviewers to post personal profiles, available to other members to view, may help bring reviewers' virtual presence to life, and thus serve to increase the sense of community, and enhance the utility of social interactions.

In sum, the above are but a few examples of how our findings can be used to craft strategies to present, solicit, stimulate, and utilize eWOM. With the rapid growth of user-generated content,

retail firms are seeking the insights of how consumers make use of such content. Along this direction, our work makes a meaningful contribution to our knowledge.

Limitations and future research

In this paper, we limit our analysis to several important characteristics of the review, product type, and reviewer. Additional review characteristics, such as review extremity (e.g., the use of superlatives) and review argument (e.g., one sided vs. two sided), may be interesting for future research. Our work only focuses on one product categorization (i.e., experiential vs. utilitarian products). Future research may explore different purchase situations (e.g., high vs. low involvement purchases), and the differences between goods and services. For many services, the perceived quality may vary considerably across consumers and consumption occasions (Parasuraman, Zeithaml, and Berry 1985). Thus, the helpfulness of the communicated eWOM may involve additional considerations.

Our study examines only one type of reviewer characteristics (i.e., innovativeness). Other reviewer traits, such as reputation/ranking in the virtual community, may be used by review readers as surrogates for credibility, and thus may mediate the effect of eWOM on consumer attitudes and product sales (Forman, Ghose, and Wiesenfeld 2008). Our data, however, does not allow us to explore the effects of reviewer reputation. Product reviews on Amazon.com do not readily show reviewer ranking, except for those written by a tiny fraction of reviewers (i.e., top 1,000 reviewers). For future research, it will be interesting to examine the effect of explicitly communicated reviewer reputation on review helpfulness, using data collected from other sources in which reviewer reputation/experience is presented together with the review content.

It is also important to note that this study does not examine the effect of review on consumers' product attitude/choice/purchase-intent/sales, as many prior studies have done (e.g., Gupta and Harris 2009; Park et al. 2007; Zhu and Zhang 2010). Instead, we examine, from the readers' perspective, a product review's perceived helpfulness. Future studies, particularly those conducted in controlled environments, may examine the link between an individual review and its role in consumers' decision making.

Lastly, our data does not come from a controlled environment, and thus may be subject to confounds. For instance, reviewers with interest in the success/failure of the reviewed product (e.g., advertisers, competitors) may "plant" positive/negative reviews, and subsequently rate these reviews as helpful. If this manipulation occurs extensively, both product reviews and review helpfulness may contain systematic bias. In addition, in review helpfulness ratings, we cannot observe abstaining behavior. Voting on a review's helpfulness is, by itself, an expression of consumer involvement. In this sense, our data perhaps does not adequately account for review evaluations made by those who are not sufficiently involved with the product (e.g., in an early buying stage) or with the review (e.g., do not find a review particularly helpful or unhelpful). Lastly, certain control variables (e.g., *Age of review*) in Study 1 do not have complete information at the individual voting level. Although excluding these variables would not substantially change our findings/conclusions, it may be ideal for future research to gather data at the voting level, particularly when these control variables are of key interest to researchers.

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Appendix A. Content analysis coding scheme

Socioeconomic characteristics	
Education	Educational attainment (years of formal education) Code "Yes" if the reviewer indicates and/or implies a bachelor's degree or higher.
Literacy	Code "Yes" if the reviewer is able to read and write.
Social status	Code "Yes" if the reviewer indicates high social status. Social status is indicated by the following variables: 1. economic well-being (e.g., income, level of living, expenditures, possession of wealth); 2. occupational prestige; 3. identification with a high social caste.
Upward social mobility	Code "Yes" if the reviewer is on the move in the direction of still higher levels of social status.
Identification with a large organization	Code "Yes" if the reviewer is affiliated with a large organization (e.g., company, school, and community).
Personality variables	
Empathy	Empathy is the ability of an individual to project himself or herself into the role of another person. Code "Yes" if the reviewer is able to think counterfactually, and to take the roles of others.
Abstraction	Code "Yes" if the reviewer shows comfort with abstract concepts (e.g., using technical terms to describe abstract concepts).
Rationality	Code "Yes" if the reviewer shows clear rationality/reasoning in the review.
Intelligence	Code "Yes" if the reviewer shows intelligence (i.e., manifestation of capacity for learning, reasoning, understanding, and similar forms of mental activity).

Appendix A (*Continued*)

Attitude toward change	Code "Yes" if the reviewer indicates a favorable attitude toward change.
Uncertainty	Code "Yes" if the reviewer indicates abilities to cope with risk and uncertainty.
Attitude toward science	Code "Yes" if the reviewer indicates a favorable attitude toward science or scientific research (e.g., using experiments to evaluate different products).
Fatalism	Fatalism is the degree to which an individual perceives a lack of ability to control his or her future. Code "Yes" if the reviewer is fatalistic (e.g., thinking the future is determined by fate) (reversely coded).
Aspiration	Code "Yes" if the reviewer shows high aspirations for formal education, social status, and occupation.
Communication behavior	
Social participation and connectedness	Social participation and connectedness includes contact with neighbors, friends, and family (e.g., calling friends or relatives just to talk, visiting family or friends), and participation in social groups (e.g., doing volunteer work or attending religious service). Code "Yes" if the reviewer demonstrates some social participation.
Cosmopolite	Cosmopoliteness is the degree to which an individual is oriented outside a social system. Code "Yes" if the reviewer is involved in matters beyond the boundaries of their local system (e.g., travel widely, and attend out-of-town professional meetings).
Mass media communication channels	Code "Yes" if the reviewer shows great exposure to mass media communication channels.
Interpersonal communication channels	Code "Yes" if the reviewer shows great exposure to interpersonal communication channels.
Information-seeking	Code "Yes" if the reviewer actively seeks information about innovations from various sources (e.g., Internet, stores, reviews, and friends) before product decision.
Knowledge of innovations	Code "Yes" if the reviewer is knowledgeable of innovations or new products.
Opinion leadership	Code "Yes" if the reviewer indicates that he/she holds an opinion-leadership role in a social group. Certain professions may signal opinion leadership roles (e.g., teachers/trainers, and decision makers in an organization).

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