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Emotional expressions in online user reviews: How they influence consumers' product evaluations

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ABSTRACT

This article investigates an understudied aspect of online word-of-mouth (eWOM) — the effects of emotional expressions in eWOM. Two experiments investigate how consumers interpret emotional expressions in online user reviews and the subsequent impact on their product evaluations. The findings reveal that negative emotional expressions in a single negative review tend to *decrease* the reviews' informative value and make consumers' product evaluations *less negative* because consumers attribute the negative emotions to the reviewer's irrational dispositions. However, positive emotional expressions in a single positive review do not influence consumers' product evaluations significantly even though consumers attribute the positive emotions to the product. Next, when multiple convergent emotional expressions are present in multiple user reviews, both positive and negative emotional expressions increase informative value of the reviews and polarize consumers' product evaluations in the respective direction.

1. Introduction

Electronic word-of-mouth (eWOM) is now a crucial product information source as communication technology improvements and social media facilitate information exchanges between more consumers. Another reason for these exchanges is that consumers perceive consumer-provided information to be of higher credibility than marketer-provided information (Bickart & Schindler, 2001). However, unlike face-to-face WOM, which is typically from individuals who are familiar to or viewed as knowledgeable by the receiver, eWOM is typically from strangers whose identity and credibility are unknown. These key differences necessitate investigation of the boundary conditions associated with eWOM usage.

Thus, researchers explore consumers' motivations to engage in eWOM (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004), the economic and social value consumers derive from eWOM (Balasubramanian & Mahajan, 2001), the effects of eWOM on customer value and loyalty (Gruen, Osmonbekov, & Czaplewski, 2006), cross-cultural differences in eWOM (Fong & Burton, 2008), differences in eWOM effectiveness across eWOM valence and product type (Park & Lee, 2009), and the effects of consumption goals on persuasiveness of eWOM (Zhang, Craciun, & Shin, 2010).

An aspect of eWOM that requires exploration, however, is how emotions in eWOM influence product evaluations. While emotions are abundant in traditional WOM since releasing emotions is a major motivation of senders (Nyer, 2000; Nyer & Gopinath, 2005), emotional expressions are even more pervasive in eWOM since inhibitions in expressing them in anonymous communications are minimal (Kiesler, Siegel, & McGuire, 1984; Rice & Love, 1987). Further, to compensate for the lack of ability to communicate non-verbally online, consumers compensate by using intense and explicit emotional expressions (Reilly & Seibert, 2003). Although emotions may manifest in various nuanced ways (Laros & Steenkamp, 2005), we focus on emotions defined as high intensity, valenced feeling states that are associated with the product of interest (Erevelles, 1998).

In face-to-face WOM, studies demonstrate that senders' emotional expressions influence consumers by first eliciting reciprocal affective responses (Howard & Gengler, 2001; Pugh, 2001). However, emotions in eWOM typically lack necessary elements such as nonverbal cues like facial expressions, tone of voice, physical proximity and personal ties between senders and receivers to elicit reciprocal affective responses (Daft, Lengel, & Trevino, 1987; Hatfield, Cacioppo, & Rapson, 1994). Therefore, if emotions in eWOM influence consumers' product evaluations, they are more likely to do so through a cognitive, rather than an affective, process. This research investigates how emotions in eWOM influence consumers' product evaluations.

2. Theory and hypotheses

Emotions in online user reviews are unlikely to evoke affective reactions in receivers because there are no personal ties or physical proximity between senders and receivers (Hatfield et al., 1994).

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Nevertheless, given their interest in the focal product, consumers may cognitively process emotions in such reviews (Öhman, 1987). The cognitive process underlying evaluation of others' emotions, "emotional understanding" (Planalp, 1999), purports that one's understanding of another's emotions may be elaborate and complete, with all aspects of the emotion fitted into a coherent story (e.g., what caused the emotion, what conditions facilitated it, how to react to it, how the person was managing, etc.). However, empirical studies show that people tend to focus only on understanding what caused the emotion and how to react to it (Frijda & Tcherkassof, 1997; Stein & Liwag, 1997).

Attribution theories (e.g., Folkes, 1988; Folkes & Kostov, 1986) indicate that consumers may attribute the emotions internally (i.e., to reviewer personal dispositions) or externally (i.e., to the reviewed product). Self-serving bias studies in attribution show that people tend to attribute their own positive behaviors and others' negative behaviors internally, but tend to attribute their negative behaviors and others' positive behaviors externally (Larson, 1977; Tarrant & North, 2004; Zuckerman, 1979). These insights suggest that whether consumers attribute the emotions internally (e.g. reviewer personal dispositions) or externally (e.g. the product) may depend on whether they see the emotions as positive or negative behaviors. The emotional development literature suggests that the valence may determine whether consumers see emotions as positive or negative behaviors. All societies have norms that specify when, where, and how it is appropriate to express emotions (Ekman, 1973). For instance, public expressions of positive emotions are generally encouraged since they foster positive social interaction whereas negative emotions are often frowned upon since they cause unpleasantness (Diefendorff & Richard, 2003; Gross, John, & Richards, 2000; Matsumoto, 1990; Saarni, 1999).

Thus, consumers are likely to judge emotions in a review as inappropriate when negative and acceptable when positive. Further, self-serving bias research suggests that consumers are likely to attribute negative emotions internally to the reviewer's personal disposition and positive emotions externally to the product. If consumers attribute negative emotions to the reviewer's personal dispositions rather than the product, those emotions are unlikely to influence consumers' product evaluation directly. When emotions reflect a person's disposition, consumers may interpret them as indicators of irrationality or weak self-control (Parrott, 1995), making the review less informative. Consumers may then discount the information in the review, leading to *less* negative product evaluations. Hence,

H1a. Consumers will consider a provider of a negative user review as less rational when negative emotions are expressed compared to when no emotions are expressed.

H1b. Consumers will consider a negative user review as less informative when negative emotions are expressed compared to when no emotions are expressed.

H1c. Consumers will evaluate a product less negatively when negative emotions are expressed compared to when no emotions are expressed in a negative user review.

In contrast, if consumers attribute positive emotions in a positive review to the product, emotions should serve as additional product information and influence product evaluations directly. For instance, an expression of delight in a positive review may indicate greater product quality than an otherwise identical review. Hence,

H2a. Consumers will consider a positive user review as more informative when positive emotions are expressed compared to when no emotions are expressed.

H2b. Consumers will evaluate a product more positively when positive emotions are expressed compared to when no emotions are expressed in a positive user review.

3. Study 1

3.1. Method

We test hypotheses with a 2×2 between subjects factorial experiment where review valence (positive vs. negative) and emotions (present vs. absent) are independent variables. Laptops are the focal product since a focus group indicated that the complexity of and high involvement with computers suggest consumers' use of past user reviews.

A total of 129 undergraduate business students at a large southern university are recruited in exchange for extra credit. In a lab, they are told that their task is to visit an online electronics store, examine laptops and select one for themselves. To begin, the participants complete questions measuring their computer involvement. Then, they visit a fictitious online store (AtoZTronics) to complete their task, following which they complete the questionnaire measuring the dependent, manipulation check, and control variables.

A professional developed the website to mimic current online retailers (Appendix A) and allow participants to research each laptop on specifications that closely resemble actual laptops. Tools to sort and compare laptops in tables and glossaries of technical terms are available. The website follows industry best practices for privacy, security, returns policies, price guarantees, support and shipping. The website offers three laptops and user reviews are available for one, the focal laptop. For each of the four conditions there is one user review pop-up, which randomly opens when the user review icon is clicked, creating random assignment of participants to experimental conditions. Average task completion time is 25 min.

In a pretest, 24 user reviews of computers collected from retail websites are rated by 48 students for valence (1 = Extremely negative, 9 = Extremely positive) and emotionality (1 = Not emotional at all, 9 = Extremely emotional). A moderately positive ($M = 6.3$, $SD = 1.96$) and unemotional ($M = 2.7$, $SD = 1.56$) review, "I bought this laptop in August 2004. Works well. Speed is good enough for Internet surfing and regular college work at the same time" is selected as the non-emotional positive review. The review is modified to "I bought this laptop in August 2004. Does not work well. Speed is not good enough for Internet surfing and regular college work at the same time," as the non-emotional negative review. This approach kept length and attributes mentioned constant while varying valence. Negative expressions like "Works poorly" are avoided since explicit negative words could render the review as more intense and stronger, confounding the intended review valence and intensity (Reilly & Seibert, 2003).

According to conventions of expressing written emotions (Carey, 1980; Reilly & Seibert, 2003), emotions are added using emoticons, bold capital letters and a phrase describing the reviewer's internal emotional state. The emotional positive review read, "I bought this laptop in August 2004. **WORKS WELL!!!** Speed is good enough for Internet surfing and regular college work at the same time. **I'M PLAIN DELIGHTED!!"** The emotional negative review read, "I bought this laptop in August 2004. **DOES NOT WORK WELL!!!** Speed is not good enough for Internet surfing and regular college work at the same time. **I'M PLAIN MAD!!"**.

Participants' laptop evaluation is measured using a four-item ("favorable–unfavorable," "bad–good," "negative–positive," and "like–dislike"), nine-point scale ($\alpha = .95$). Perceived informative value of the review is measured by Gilly, Graham, Wolfinbarger, and Yale (1998) three-item, "The user reviews provided were useful," "I think I learned a lot about the reviewed laptop after reading the user reviews," and "The user reviews provided valuable information" ($\alpha = .93$), nine-point Likert scale (1 = strongly disagree, 9 = strongly agree). Perceived reviewer rationality is measured with a three item ("irrational-rational," "reasonable-unreasonable," and "unreliable-reliable") nine-point scale ($\alpha = .83$). Higher ratings indicate stronger

evaluations. Retrospective verbal protocols (Ericsson & Simon, 1984) are collected to validate the presumed attribution process. Participants are asked to report any thoughts on the review, reviewer, or the reviewed product that occurred to them.

As a manipulation check, review valence is measured by a two-item ("favorable–unfavorable," and "positive–negative") nine-point scale ($\alpha = .94$). Participants' perceptions of the reviewer's anger and happiness are measured by three-item nine-point scales (1 = strongly disagree, 9 = strongly agree). The anger items are "angry," "mad," and "furious" ($\alpha = .97$) and the happiness items are "happy," "delighted," and "excited" ($\alpha = .94$) (Richins, 1997). Participants' own anger and happiness are measured before and after the task.

Participants' subjective knowledge of computers is measured with a five-item ("knowledgeable–not knowledgeable," "competent–not competent," "an expert–not an expert," "not trained–trained," and "experienced–inexperienced") scale ($\alpha = .87$). Participants' involvement with computers is measured with Zaichkowsky's (1994) 10-item nine-point scale ($\alpha = .87$). The purpose is to screen out participants with high subjective knowledge or low involvement, given a lower likelihood to use user reviews.

3.2. Results

3.2.1. Manipulations

We exclude one participant for not clicking on the review. The remaining 128 have moderate subjective knowledge ($M = 6.6$, $SD = 1.27$) and high involvement ($M = 8.0$, $SD = .96$) with computers. Participants see the positive review positively ($M = 6.5$, $SD = 1.71$) and the negative one negatively ($M = 3.8$, $SD = 2.22$), indicating successful valence manipulation. The means difference is significant ($F(1, 124) = 58.26$, $p < .001$). The insignificant valence and emotions interaction ($F(1, 124) = .50$, $p = .482$) shows that emotions do not make the review more extreme in valence.

In the negative conditions, the emotional reviewer ($M = 7.2$, $SD = 2.13$) is viewed as angrier ($t(61) = 2.1$, $p = .040$) than the non-emotional one ($M = 6.0$, $SD = 2.51$). In the positive conditions, the emotional reviewer ($M = 7.3$, $SD = 1.67$) is seen as happier ($t(63) = 2.7$, $p = .009$) than the non-emotional one ($M = 6.1$, $SD = 1.93$). Thus, emotions manipulation is successful.

No significant difference between any conditions is found for participants' pre-task anger ($M = 2.0$, $SD = 1.19$) and post-task anger ($M = 1.9$, $SD = 1.24$) or pre-task happiness ($M = 5.5$, $SD = 1.34$) and post-task happiness ($M = 5.5$, $SD = 1.65$). A series of paired-sample t-tests reveal no significant difference between participants' pre-task emotions and post-task emotions in any condition.

3.2.2. Dependent variables

The interaction between valence and emotions on perceived reviewer rationality ($F(1, 124) = 6.10$, $p = .015$) is significant. In the negative conditions, rationality is significantly lower ($t(61) = 3.1$, $p = .003$) with emotions ($M = 5.2$, $SD = 1.20$) than without ($M = 6.3$, $SD = 1.60$), supporting H1a. In the positive conditions, rationality is not different ($t(63) = .18$, $p = .855$) whether emotions are present ($M = 6.2$, $SD = .91$) or not ($M = 6.2$, $SD = 1.09$).

Emotions ($F(1, 124) = 5.60$, $p = .020$) and the interaction between valence and emotions ($F(1, 124) = 5.95$, $p = .016$) significantly impact review informative value. The emotional negative review ($M = 4.5$, $SD = 2.26$) is significantly *less* informative ($t(61) = 3.6$, $p = .001$) than the non-emotional one ($M = 6.5$, $SD = 1.94$), supporting H1b. Informativeness between the emotional and non-emotional positive reviews is not significantly different ($t(63) = .05$, $p = .961$). H2a is not supported.

The interaction effect between valence and emotions on product evaluation is significant ($F(1, 124) = 4.54$, $p = .035$). In the negative conditions, evaluation is significantly *less* negative ($t(61) = 2.8$, $p = .007$) with emotions ($M = 5.9$, $SD = 1.84$) than without ($M = 4.5$, $SD = 2.12$), supporting H1c. In the positive conditions, there is no significant difference ($t(63) = .40$, $p = .690$) in product evaluation with or without emotions. H2b is not supported.

3.2.3. Mediation

Emotions have significant effects (Table 1), moderated by review valence, on perceived reviewer rationality (Model A) and review informative value (Model B). However, in Model C the effects on informative value become insignificant with rationality in the model, indicating that the impact of emotions on informative value is mediated through perceived rationality (Baron & Kenny, 1986). Similarly, the significant effects of emotions on product evaluation (Model D) become insignificant when review informative value and the interaction term with valence are included (Model E). Thus, the effects of emotions on product evaluation are mediated through informative value and are moderated by review valence.

Further, moderated mediation tests (Preacher, Rucker, & Hayes, 2007) confirm that the effects of emotions on informative value of the review, mediated through perceived reviewer rationality, are significant for a negative review ($b = -.954$, $p < .001$) but not for a positive review ($b = .049$, $p = .937$). Also, the effect of emotions on product evaluations, mediated through perceived reviewer rationality and perceived informative value of the user review, are significant for a negative review ($b = .500$, $p = .038$), but not for a positive review ($b = .005$, $p = .980$).

3.2.4. Protocols

We analyze retrospective protocols to examine whether attributions differ by valence, as theorized. Two independent coders coded the responses into categories provided by the authors, including reviewer personality and product quality (Appendix B). We provided category definitions and keywords to the coders. The initial inter-coder agreement is 94.3% and the discrepancy is resolved through discussion.

In the negative emotional condition, significantly more respondents ($\chi^2 = 4.90$, $p = .027$) commented (29%) on the reviewer's negative dispositions (e.g., impatient, not in control, etc.) compared to the negative non-emotional condition (6.9%). Further, in the emotional condition, significantly fewer respondents ($\chi^2 = 4.34$, $p = .035$) commented on laptop quality (3.2%) compared to the non-emotional condition (20.7%). These findings support the theory that attributions of negative emotions are likely to be towards the reviewer rather than the product. In the positive conditions, protocols did not support the prediction that respondents are more likely to attribute emotions to the product rather than the reviewer.

3.3. Discussion

The results support the hypotheses that negative emotions in a negative review lower perceived reviewer rationality, thereby reducing review informative value and, in turn, lead to less negative product evaluations. However, neither hypothesis about positive emotions in a positive review is supported. One possible explanation is the discounting principle of attribution credibility (Folkes, 1988; Kelley, 1967), which postulates that the validity of an attribution based on a single observation may be discounted, especially when the event can be attributed to multiple plausible causes. Thus, participants may have discounted the potential relationship between positive emotions and product quality, given only one review. In the negative review conditions, discounting of the attribution of emotions may have been less due to the negativity bias in information diagnosticity (Herr, Kardes, & Kim, 1991).

4. Study 2

Attribution theory suggests that consensus in observations is a key criterion for validating attributions (Hansen & Scott, 1976). Thus,

Table 1
Study 1 mediation analyses.

Predictors	Model A — dependent variable: perceived rationality of reviewer			
	B	S_b	*t*	*Sig.*
(Constant)	6.271	0.237	26.419	0.000
Valence of user review	−0.177	0.336	−0.528	0.599
Emotional expression	−1.115	0.338	−3.295	0.001**
EEX × VAL#	1.173	0.475	2.470	0.015*

Predictors	Model B — dependent variable: informative value of user review				Model C — dependent variable: informative value of user review			
	B	S_b	*t*	*Sig.*	*b*	S_b	*t*	*Sig.*
(Constant)	6.448	0.402	16.041	0.000	1.082	0.897	1.207	0.230
Valence of user review	−1.417	0.568	−2.492	0.014*	−1.265	0.493	−2.566	0.012*
Emotional expression	−1.932	0.573	−3.371	0.001**	−0.978	0.518	−1.888	0.061
EEX × VAL#	1.961	0.804	2.439	0.016*	0.958	0.714	1.342	0.182
Perceived rationality of reviewer					0.856	0.132	6.493	0.000**

Predictors	Model D — dependent variable: evaluation of reviewed laptop				Model E — dependent variable: evaluation of reviewed laptop			
	B	S_b	*t*	*Sig.*	*b*	S_b	*t*	*Sig.*
(Constant)	4.500	0.297	15.164	0.000	6.449	0.687	9.388	0.000
Valence of user review	2.219	0.420	5.287	0.000**	−0.710	0.852	−0.834	0.406
Emotional expression	1.395	0.423	3.298	0.001**	0.811	0.444	1.828	0.070
EEX × VAL#	−1.265	0.594	−2.132	0.035*	−0.687	0.595	−1.156	0.250
Informative value of user review					−0.302	0.097	−3.112	0.002**
INF × VAL#					0.497	0.128	3.894	0.000**

Valence of user review	Conditional effects of emotional expression on informative value of user review				Conditional effects of emotional expression on evaluation of reviewed laptop			
	b	*SE*	*z*	*p*	*b*	*SE*	*z*	*p*
Negative (VAL = 0)	−0.954	0.325	−2.938	.003.**	0.500	0.241	2.077	.038.*
Positive (VAL = 1)	0.049	0.629	0.079	.937	0.005	0.196	0.025	.980

EEX: emotional expression, VAL: valence of user review, INF: informative value of user review.
* Significant at 5% level.
** Significant at 1% level.

observation of convergent positive emotions in multiple reviews may validate attribution of the emotions to product quality. Similarly, observation of convergent negative emotions in multiple negative reviews may validate attributions of the negative emotions to the product since the alternative attribution that all reviewers are irrational becomes less plausible. Hence,

H3a. Consumers will view user reviews as more informative when convergent emotions are expressed in multiple reviews compared to when no emotions are expressed.

H3b. Consumers evaluation of the product will be more positive when convergent positive emotions are expressed in multiple user reviews compared to when no emotions are expressed.

H3c. Consumers evaluation of the product will be more negative when convergent negative emotions are expressed in multiple user reviews compared to when no emotions are expressed.

4.1. Method

A total of 143 undergraduate business students at a large southern university are recruited in exchange for extra credit. The experiment is identical to Study 1, except that every condition had three user reviews. From the user review pool collected earlier, two moderately positive and unemotional reviews are selected in addition to the one used in Study 1. They are: "Overall, this machine works fairly well. The screen is quite crisp, and the machine has been reliable," and "I have had no problems with this laptop. Also, the battery life improves if you dim the screen and reduce processor power." Repeated measures ANOVAs on valence and emotionality of the three reviews indicate no significant difference among the reviews with respect to emotionality (Wilks Lambda = .961, $F(2, 45) = .098$, $p = .406$) or valence (Wilks Lambda = .996, $F(2, 45) = .920$, $p = .907$). Next, the two additional reviews were modified to read "Overall, this machine doesn't work that well. The screen is not so crisp, and the machine has not been very reliable," and "I have had some problems with this laptop. Also, the battery life does not improve even if you dim the screen and reduce processor power" to be used in negative conditions.

The two additional positive reviews with emotions read "Overall, this machine works fairly well. The screen is **QUITE CRISP**, and the machine **HAS BEEN RELIABLE**. **I'm SOoooooo HAPPY!!**" and "I have had **NO PROBLEMS** with this laptop. **I'M REALLY EXCITED!!** Also, the battery life **IMPROVES** if you dim the screen and reduce processor power."☺☺☺ Negative reviews with emotions read "Overall, this machine doesn't work that well. The screen is **NOT SO CRISP**, and the machine has **NOT BEEN VERY RELIABLE**. **I'm SOoooooo ANGRY!!**" and "I have had some **PROBLEMS** with this laptop. **I'M REALLY FURIOUS!!** Also, the battery life **DOES NOT** improve even if you dim the screen and reduce processor power."😡😡😡 The fact that three different persons provided the three reviews is made clear (see Appendix A).

The only difference with Study 1 is that participants are told to provide their average perceptions of the three reviews and reviewers. Convergence among the emotions is measured using a three-item nine-point scale (1 = Strongly disagree, 9 = Strongly agree), consisting of "Past users were in agreement with regard to their feelings toward the reviewed laptop," "Past users seem to say the same thing about the reviewed laptop," and "Past users of the reviewed laptop seem to have had similar emotional experiences" ($\alpha = .83$).

4.2. Results

4.2.1. Manipulations

We exclude five participants who did not examine the reviews. The remaining 138 report moderate subjective knowledge of ($M = 6.7$, $SD = 1.22$) and high involvement with computers ($M = 8.0$, $SD = .90$). Participants consider the positive reviews positive ($M = 7.7$, $SD = 1.56$) and negative reviews negative ($M = 2.5$, $SD = 2.08$), indicating successful valence manipulation. The means difference is significant ($F(1, 134) = 285.19$, $p < .001$). The insignificant valence and emotions interaction ($F(1, 134) = .20$, $p = .656$) indicates no evidence that emotions make the reviews more intense in valence. Participants also perceive consensus in the reviews ($M = 7.1$, $SD = 1.79$) and no difference was found between any conditions on this measure.

In the negative conditions, the emotional reviewers ($M = 7.4$, $SD = 2.23$) are viewed as angrier ($t(65) = 3.1$, $p = .003$) than the non-emotional ones ($M = 5.8$, $SD = 2.01$). In the positive conditions, the emotional reviewers ($M = 8.1$, $SD = 1.15$) are seen as happier ($t(69) = 5.7$, $p < .001$) than the non-emotional ones ($M = 6.4$, $SD = 1.36$). Thus, the emotion manipulations are successful.

No significant difference between any conditions is found for participants' pre-task anger ($M = 2.3$, $SD = 1.54$) and post-task anger ($M = 2.3$, $SD = 1.66$) or pre-task happiness ($M = 5.3$, $SD = 1.40$) and post-task happiness ($M = 5.3$, $SD = 1.56$). A series of paired-sample t-tests reveal no significant difference between participants' pre-task emotions and post-task emotions in any condition.

4.2.2. Dependent variables

Emotions have a significant effect on review informative value ($F(1, 134) = 5.01$, $p = .027$) but the interaction between valence and emotions does not ($F(1, 134) = .07$, $p = .788$). Regardless of valence, multiple emotional reviews are more informative ($M = 6.4$, $SD = 1.87$) than non-emotional reviews ($M = 5.7$, $SD = 1.97$), supporting H3a.

The impact of valence on product evaluation ($F(1, 134) = 96.61$, $p < .001$) and the interaction with emotions ($F(1, 134) = 12.13$, $p = .001$) is significant. Product evaluation is significantly more positive ($t(69) = 3.1$, $p = .003$) when convergent positive reviews are emotional ($M = 7.4$, $SD = 1.08$) than when they are not ($M = 6.4$, $SD = 1.43$). H3b is supported. Likewise, evaluations are significantly *more* negative ($t(65) = 2.2$, $p = .035$) when convergent negative reviews are emotional ($M = 3.4$, $SD = 1.96$) than when they are not ($M = 4.5$, $SD = 2.22$), supporting H3c.

4.2.3. Mediation

Models A and B in Table 2 indicate that emotions have significant effects on reviews' informative value but not on perceived reviewers' rationality. Including rationality (Model C) does not reduce the effects of emotions on informative value. In addition, the positive signs of the coefficients for emotions and the insignificant interaction terms in Models B and C indicate that emotions increase informative value regardless of reviews' valence. These results show that convergent emotions in multiple reviews influence informative value directly rather than through perceived reviewers' rationality, irrespective of valence.

Coefficients in Models D and E reveal that the effects of emotions on product evaluation are partially mediated through informative value. A moderated mediation test reveals that the effect of negative emotions on product evaluations mediated through informative value

Table 2
Study 2 mediation analyses.

	Model A — dependent variable: perceived rationality of reviewer			
Predictors	*B*	S_b	*t*	*Sig.*
(Constant)	5.186	0.280	18.531	0.000
Valence of User Review	−0.010	0.390	−0.026	0.980
Emotional Expression	−0.123	0.405	−0.304	0.761
EEX × VAL[#]	−0.067	0.564	−0.119	0.905

	Model B — dependent variable: informative value of user review				Model C — dependent variable: informative value of user review			
Predictors	*B*	S_b	*t*	*Sig.*	*b*	S_b	*t*	*Sig.*
(Constant)	6.053	0.278	21.741	0.000	4.425	0.565	7.828	0.000
Valence of user review	−0.742	0.323	−2.296	0.023*	−0.728	0.312	−2.334	0.021*
Emotional expression	0.723	0.323	2.238	0.027*	0.773	0.313	2.472	0.015*
EEX × VAL[#]	−0.044	0.649	−0.068	0.946	−0.039	0.627	−0.062	0.951
Perceived rationality of reviewer					0.313	0.096	3.274	0.001**

	Model D — dependent variable: evaluation of reviewed laptop				Model E — dependent variable: evaluation of reviewed laptop			
Predictors	*B*	S_b	*t*	*Sig.*	*b*	S_b	*t*	*Sig.*
(Constant)	4.536	0.292	15.551	0.000	7.648	0.707	10.811	0.000
Valence of user review	1.867	0.407	4.589	0.000**	−2.982	0.897	−3.324	0.001**
Emotional expression	−1.106	0.422	−2.621	0.010**	−0.685	0.388	−1.763	0.080
EEX × VAL[#]	2.049	0.588	3.483	0.001**	1.421	0.538	2.642	0.009**
Informative value of user review					−0.518	0.109	−4.734	0.000**
INF × VAL[#]					0.842	0.143	5.908	0.000**

	Conditional effects of emotional expression on informative value of user review				Conditional effects of emotional expression on evaluation of reviewed laptop			
Valence of user review	*b*	*SE*	*z*	*p*	*b*	*SE*	*z*	*p*
Negative (VAL = 0)	−0.039	0.127	−0.303	.762	−0.375	0.185	−2.025	.043*
Positive (VAL = 1)	−0.060	0.218	−0.273	.785	0.235	0.173	1.355	.175

[#] EEX: emotional expression, VAL: valence of user review, INF: informative value of user review.
* Significant at 5% level.
** Significant at 1% level.

is significant ($B = -.375$, $p = .043$), but the effects of positive emotions is not ($B = .235$, $p = .175$).

4.2.4. Protocols

Two independent coders coded the retrospective verbal protocols. Initial inter-coder agreement is 92.7%, and disagreement is resolved through discussion (Appendix B). In the negative conditions, 12.5% of respondents in the emotional condition comment on the reviewers' personal dispositions while 21.9% comment on negative product quality. Neither percentage was significantly different from the negative non-emotional condition, 5.9% ($\chi^2 = .87$, $p = .350$) and 29.4% ($\chi^2 = .49$, $p = .484$), respectively. Similarly, 5.9% reading emotional positive reviews comment on the reviewers' personal dispositions while 14.7% comment on positive product quality. Neither percentage was different from the non-emotional positive reviews, 6.3% ($\chi^2 = .01$, $p = .950$) and 12.5% ($\chi^2 = .07$, $p = .794$). Compared to Study 1, fewer participants (12.5% vs. 29.0%) attribute negative emotions to reviewers' personal dispositions and more (21.9% vs. 3.2%) attribute them to the product. Additionally, more participants who read emotional positive reviews comment on the product quality (14.7%) compared to Study 1 (3.0%). These results support the theory that consensus in emotions in multiple reviews – positive or negative – are more likely to be attributed to the product rather than reviewers' dispositions.

5. Discussion

5.1. Contributions

To the extent emotions are abundant in eWOM (Kiesler et al., 1984; Reilly & Seibert, 2003; Rice & Love, 1987), this research contributes by exploring the boundary conditions associated with how consumers process emotions in eWOM. Specifically, results here show that negative emotions in a single review *decrease* informative value and *decrease* negative impact on product evaluations. However, convergent negative emotions in multiple reviews *increase* informative value and *increase* negative impact on product evaluations. On the other hand, positive emotions in one review may not exert significant positive influence on perceived informative value or product evaluations, but convergent positive emotions in multiple reviews do so.

Further, this work illuminates the psychological processes underlying the effects of emotions in eWOM, which we find influence product evaluations through a cognitive, rather than affective, mechanism. Several results suggest this. First, participants' own affective states remain unaffected by reviewers' emotions. Second, the effect of negative emotions in a single review is affect-incongruent (i.e., they lead to *less* negative evaluations), which contradicts the finding that affect should exerts affect-congruent effects on cognitions (Pham, Cohen, Pracejus, & Hughes, 2001). Third, negative emotions have stronger and clearer effects than positive emotions in both studies, which contradicts findings that positive affect exerts more consistent cognitive effects than negative affect (Bagozzi, Gopinath, & Nyer, 1999), but is consistent with the negativity effect of information diagnosticity (e.g., Herr et al., 1991).

The emotional understanding literature (Frijda & Tcherkassof, 1997; Planalp, 1999) suggests that consumers may focus on understanding the causes of emotions and how to react. However, the literature is silent on what particular causes consumers may attribute emotions to. By integrating findings from emotional development and attribution theory, this work identifies when consumers attribute eWOM emotions to the product or the reviewers' dispositions. The demonstration of how and when the locus of attribution of emotions shifts to either reviewer or product is an important contribution of this article.

5.2. Managerial implications

Anecdotal evidence suggests that managers recognize that some eWOM editing, such as curtailing foul language and personal attacks, is necessary. Our results, however, suggest that managers should not edit emotions to avoid losing important information. On the contrary, emotions should be encouraged since they may provide additional information. In single negative reviews, emotions signal reviewer irrationality and *decrease* review informative value. In multiple convergent reviews – negative or positive – emotions serve as additional product information.

Thus, it may be important for marketers to provide tools for eWOM senders to express emotions in a non-offensive manner (i.e., providing emoticons or emotional words) when writing reviews. Besides serving their need to express emotions (Nyer, 2000; Nyer & Gopinath, 2005), such systems would minimize managerial editing, attracting more eWOM senders and readers.

5.3. Limitations and future research

A single product category limits the generalizability of this work. Participants possibly attribute the emotions to reviewer dispositions rather than the product or discount the meaning of the emotions, even if they attribute them to the product, because computers are utilitarian products for which emotions may be unimportant. If emotions are salient aspects of the consumption experience, readers may attribute emotions, even in single reviews, to the product. Studies of the effects of one's own affective states on evaluations have shown such differential effects for hedonic products (Adaval, 2001; Yeung & Wyer, 2004). Future work on the impact of eWOM emotions for emotion-laden products will be interesting.

Besides product type, consumers' involvement levels may influence how they process emotions in eWOM. To the extent less involved individuals tend to use simple heuristic processing strategies whereas more involved individuals scrutinize stimuli at attribute level (Alba & Hutchinson, 1987), we expect that low involvement consumers would process an online review as a whole piece of information. Thus, they would not adjust the overall meaning they extract based on emotionality or consensus etc. Therefore, emotions in eWOM may have limited effects on low involvement consumers' product evaluations.

Another promising research area is the differential effects of various nuances of emotions (i.e., subtle vs. explicit). While we used explicit and intense emotions, there are other subtle, circumlocutory ways to express emotions in text-based communications such as the use of semantic or lexical intensifiers (Carey, 1980). Compared to intense emotions, readers may view subtle, circumlocutory emotions as more acceptable. Milder emotions may signal reviewer self-control and thus, enhance reviewer rationality and review informative value.

Finally, the effects of different types of emotions in reviews on consumers' product evaluations would be interesting (see Laros & Steenkamp, 2005). For instance, unlike emotions like anger, consumers may see emotions like regret or pride as more rational and acceptable, enhancing the review's informative value. Given different display norms for various emotions, exploring these effects of various emotion types should provide richer insights into how readers interpret others' emotions in non-face-to-face contexts.

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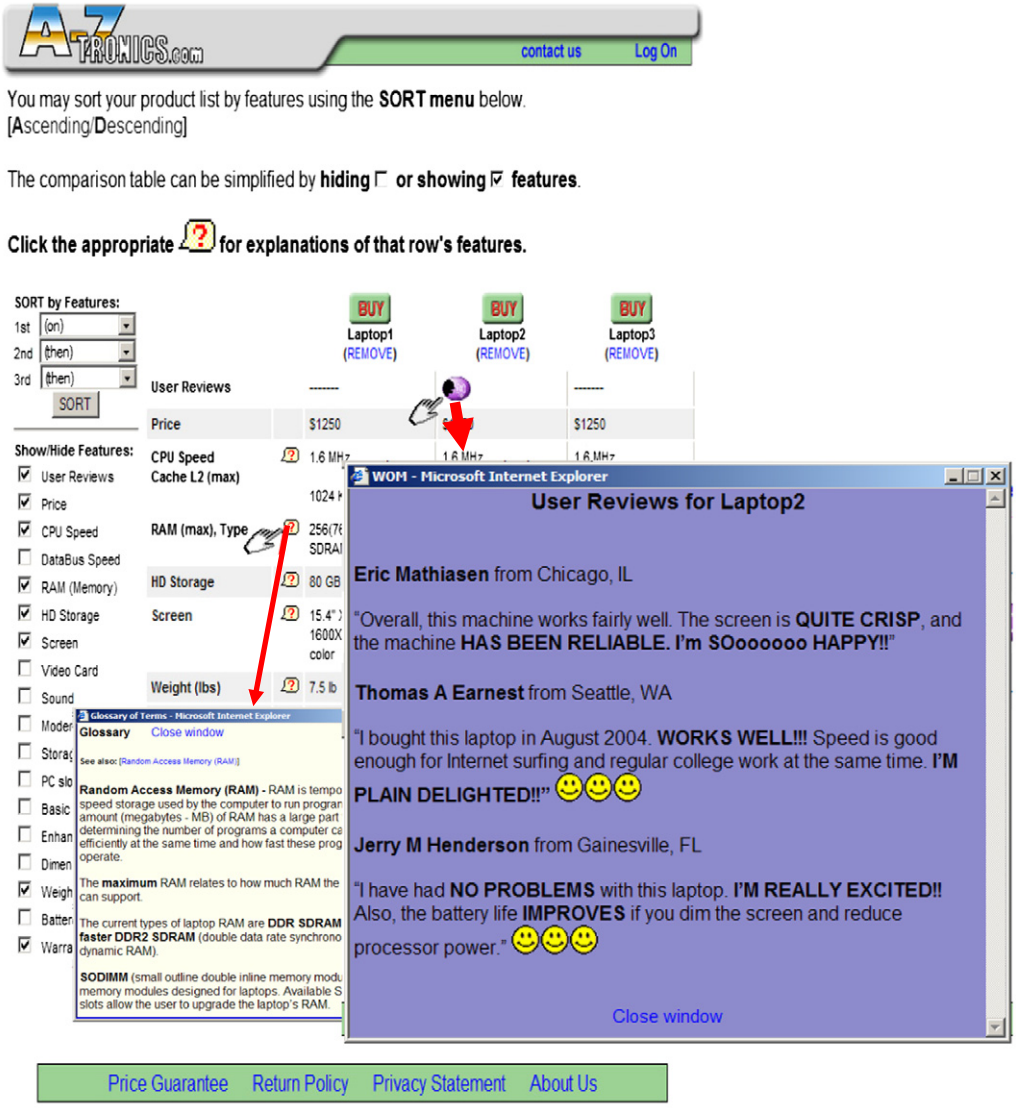
Appendix A. Sample screen shot of online store



Appendix B. Excerpts of sample protocols

Study 1: Single review	Study 2: Multiple reviews
Negative/emotional • …impatient… • …not in control… • …seemed irate and emotional. • …failed to consider the positive attributes. …very emotional… rather than logical and reasoned.	Negative/emotional • …the reviewers were telling the truth… • …they were nice… • …decent businessmen…were upset…did not get what they wanted.
Negative/Non Emotional • …normal person who didn't have a good experience… • I would take him fairly seriously… he probably had a bad experience.	Negative/Non Emotional • …seemed calm… • …are somewhat credible… • …were pretty controlled… • …wanted other buyers to know…
Positive/Emotional • …seemed to know what he was talking about… • The review was positive…	Positive/Emotional • …seemed…intelligent…very pleased… • …very satisfied…
Positive/Non Emotional • …seemed calm… • …was calm, cool, and collected…	Positive/Non Emotional • …sort of laid back, nonchalant… • None…were overly excited….nothing to complain…but nothing to exclaim…

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