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The Effects of Electronic Word of Mouth on Product Judgment and Choice: The Moderating Role of the Sense of Virtual Community[1]

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Electronic word-of-mouth (WOM) communication influences potential consumer attitudes and behavioral intentions toward a product. Since consumers frequently assess online information based on their relationships with communities, rather than with individuals, online communities themselves function as referents for assessing information quality. This study examines whether consumer perceptions toward virtual communities (i.e., sense of virtual community or SOVC) moderate the perceived influence of product comments on attitude and purchase intention. This study manipulated 2 scenarios involving positive comments and negative comments regarding a newly issued game product. Analytical results indicated that SOVC reinforced the influences of online comments on attitude and purchase intention. Thus, marketers should consider the role of virtual communities when implementing WOM strategy online.

The Internet has expanded the scope of human interactions into the online arena. People spend considerable time participating in the activities of virtual communities, complying with their norms, and obtaining a sense of belonging. People thus establish a *sense of virtual community*; that is, a psychological perception regarding the relationship between the community member and the online community (Blanchard & Markus, 2004).

Numerous virtual communities have developed around marketing interests or consumption-related information, and are termed *virtual communities of consumption* (Kozinets, 1999). Kozinets advocated carefully investigating virtual consumption communities as a potential avenue for implementing marketing efforts and business strategies because information (e.g., product comments, criticisms, user experiences) published via these online

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communities is closely related to product and service success. Since information on online communities, called *electronic word of mouth* (eWOM), is easily accessible via the Internet, consumers frequently seek relevant product information on these virtual consumption communities, rather than from inexperienced family members or friends. Because eWOMs frequently originate from market mavens or experienced users, they are considered trustworthy (Murray, 1991; Richins, 1983) and strongly influence attitude formation and purchase decisions (Bansal & Voyer, 2000; Brown, Broderick, & Lee, 2007).

Prior studies have indicated that source credibility, similarity, and tie strength between seeker and source crucially influence information persuasiveness (Bansal & Voyer, 2000; Gilly, Graham, Wolfinbarger, & Yale, 1998). However, existing theories regarding word of mouth (WOM) may not properly explain the influence of eWOM on product evaluation, owing to the anonymity and volatility of online identity. People in online communities interact with a "humanized" website, rather than with individuals; and assess information based on the website as a whole, rather than based on individuals (Brown et al., 2007). Thus, the social relationships and interactions among members of an online group are closely related to the influence of eWOM on consumer decisions. Clarifying the influence of the social power of online communities on the effects of eWOM thus is critical for understanding eWOM.

According to the accessibility–diagnosticity model (Feldman & Lynch, 1988; Herr, Kardes, & Kim, 1991), when consumers perceive their interactions with online communities as high quality, they consider information from those online communities to be more useful diagnostically than that derived from other online communities they perceive as low quality. However, no empirical study has examined whether the sense of virtual community moderates the effect of eWOM on product judgment and consumption decisions. This study examines the interaction between consumer feelings regarding online communities and the perceived influence of received information on product judgment (attitude) and choice (purchase intention).

Theory and Hypotheses

Word of Mouth in Cyberspace

The Internet enables consumers to gather unbiased product information from other consumers while also offering their own consumption-related advice via eWOM (Hennig-Thurau & Walsh, 2003). Product comments and user experiences are easily communicated electronically by online community

members. These messages are retained and classified in bulletin boards or discussion forums according to common interests or activities, such that online community members can obtain product information to assist them in decision making while simultaneously establishing relationships with other likeminded members to share their own experiences.

Consumers recognize WOM as a key source of information (Gilly et al., 1998), and moreover consider it more persuasive than mass media (e.g., advertising) because they see it as more trustworthy than other information types (Murray, 1991; Richins, 1983). To examine the influence of WOM on decision making, several studies employed the concept of *perceived influence of a referral on a decision* as a proxy variable for the true effect of specific WOM referrals (Bansal & Voyer, 2000; Gilly et al., 1998; Wangenheim & Bayon, 2004). From the perspective of information searching, information value is assessed after information seekers conduct a series of information exchanges, and perceived influence of WOM is considered a valid proxy variable for the true effect of a WOM referral (Wangenheim & Bayon, 2004). This study used *perceived influence of eWOM* as a surrogate of eWOM itself to examine its influence on the relationship between information and product attitude.

WOM communications are important in attitude formation and transformation (Brown & Reingen, 1987; Money, Gilly, & Graham, 1998). Attribution theory holds that source credibility determines message persuasiveness (Buda, 2003). Since WOM communications are more reliable and trustworthy than is information from formal marketing channels (Richins, 1983), WOM strongly influences—and even converts—attitude, particularly in the case of negative WOM (Halstead, 2002; Herr et al., 1991; Mizerski, 1982; Richins, 1983). Product comments exchanged in online communities are also considered an influential match point in purchase decisions because such comments represent evaluations of consumption experiences and are assigned greater credibility than the monotone and biased reviews of market experts or marketers with little or limited experience using the product (Bickart & Schindler, 2001; Huang & Chen, 2006). Thus, WOM communications, whether verbal (Bansal & Voyer, 2000; Wangenheim & Bayon, 2004) or electronic (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004; Hennig-Thurau & Walsh, 2003), critically influence adoption and purchase decisions (Richins, 1983).

Frequently, consumers may lack sufficient product information, even after consulting with offline friends. They may access online communities to search for relevant information to reduce uncertainty and avoid incongruities between expected and actual product performance (Bone, 1995). Thus, eWOM communications are expected to strongly influence attitude and purchase intention when consumers confront unfamiliar products (Solomon, 2004). Based on the literature, we hypothesize the following:

Hypothesis 1a. In a positive eWOM scenario, perceived influence of eWOM will positively influence online member attitude toward a reviewed product.

Hypothesis 1b. In a negative eWOM scenario, perceived influence of eWOM will negatively influence online member attitude toward a reviewed product.

Attitude is strongly and positively related to purchase intention (Kim & Hunter, 1993). Kim and Hunter conducted a meta-analysis to confirm the linkage of attitude, intention, and behavior. According to the theory of reasoned action (TRA) and its revision, the theory of planned behavior (TPB; Ajzen, 1991), attitude significantly influences behavioral intention, and intention mediates the relationship between attitude and actual behavior. Since this study investigated an artificial scenario and product, it could not observe actual purchase behavior. It used purchase intention as a proxy of actual purchase. Based on previous studies, we propose the following:

Hypothesis 2a. In a positive eWOM scenario, online member attitude toward a reviewed product will positively affect purchase intention.

Hypothesis 2b. In a negative eWOM scenario, online member attitude toward a reviewed product will positively affect purchase intention.

Virtual Community and Sense of Virtual Community

Information from online communities is generally considered as weak-tie strength referral, but it exerts a powerful influence because such online referrals can be rapidly and extensively communicated (Brown & Reingen, 1987). Virtual communities offer enormous potential for businesses to implement effective marketing communications (Hagel & Armstrong, 1997; Kozinets, 1999). Kozinets pointed out that consumer-oriented virtual communities are important to marketing and business strategies because many community affiliations are centered on consumption activities. He advocated that members who continuously identify with virtual communities rely on the relationships of those communities to consumption activities and the social relationships among members. Online communities comprise a social object that executes social functions with members, just as if they were in offline communities (Brown et al., 2007). Thus, to communicate effectively with potential consumers online, companies must consider the cultural and social influences of virtual communities.

With the emergence of the Internet and the popularity of virtual communities, people are spending more of their time interacting with online groups. Consequently, people are developing a sense of belonging and cohesion toward online communities, establishing behavioral norms, identifying with and coming to trust the problem-solving abilities of the community, and developing emotional attachments with other community members. When people participate in a virtual community, they become conscious of that community. This sense of a virtual community is a feeling of belonging and attachment toward a virtual community (Blanchard & Markus, 2004). Several studies have identified this type of consciousness in virtual environments (Blanchard & Markus, 2004; Koh & Kim, 2004; Roberts, Smith, & Pollock, 2006).

According to the accessibility–diagnosticity model, message diagnosticity increases the likelihood of a piece of information being adopted in decision making. When a message regarding a judgment or choice is perceived as diagnostic, consumers will assign a larger weight to this message when forming their attitudes, intentions, and behaviors (Feldman & Lynch, 1988; Herr et al., 1991). Several studies have confirmed that the influence of WOM on the receiver increases when informants similar to the receiver provide relevant information (Bansal & Voyer, 2000; Brown & Reingen, 1987; Gilly et al., 1998). However, for an eWOM process, the effects of traditional communicator attributes (e.g., expertise, similarity, tie strength) on perceived influence of WOM in an online context are unclear, since consumers have little knowledge of the degree of similarity between informants and themselves.

Accordingly, people may depend on the degree of interaction and feeling toward the online community as a whole in determining eWOM credibility owing to interacting with a humanized website, rather than with an individual (Brown et al., 2007). Therefore, when consumers perceive good quality relationships and interactions with their online community, they judge information from the online community as credible. That is, the member sense of online community increases message diagnosticity, thus intensifying the influence of eWOM on attitude. Therefore, we propose the following:

> *Hypothesis 3a*. In a positive eWOM scenario, the relationship between the influence of eWOM and product attitude will be stronger when sense of virtual community is higher.
>
> *Hypothesis 3b*. In a negative eWOM scenario, the relationship between the influence of eWOM and product attitude will be stronger when sense of virtual community is higher.

Method

Instruments and Data Collection

There are two questionnaires—written and online—that were designed congruently for data collection. The online questionnaire was designed using an online survey website and was posted on two well known online game community websites in Taiwan. The written questionnaires were administered by six instructors, all university lecturers or professors in northern, central, and southern Taiwan. Students in the courses taught by those instructors were invited to voluntarily participate in the survey, and their participation earned them extra course credits.

To ensure sample quality, those administering the survey were instructed in proper survey administration. Respondents were required to answer questions about their browsing habits in relation to online game communities, and moreover were asked to supply the names of the online game communities they frequented. To ensure that the sample was representative, respondents who did not complete the names of the online game communities in which they participated were excluded from the analysis.

Scenario

We designed two scenarios to represent positive and negative eWOM, respectively. The scenarios described a new game ("GaMe") becoming available in the market, with the positive and negative scenarios differing in presenting four positive and four negative product comments, respectively, regarding the new game. All positive and negative descriptions were adopted and modified from several online game discussion forums to ensure scenario authenticity.

The respondents were required to read the scenarios and imagine that the comments were published on an online community that they regularly browsed. Before issuing the formal questionnaire, a scenario check was performed to ensure the realism of the scenarios and comments. This check revealed that both scenarios were well designed in terms of realism (positive scenario, $M = 4.50$, $SD = 1.43$; negative scenario, $M = 4.98$, $SD = 1.22$), relevance (positive scenario, $M = 5.04$, $SD = 1.42$; negative scenario, $M = 4.62$, $SD = 1.51$), persuasibility (positive scenario, $M = 4.82$, $SD = 1.34$; negative scenario, $M = 5.25$, $SD = 1.30$), and comprehensibility (positive scenario, $M = 5.02$, $SD = 1.28$; negative scenario, $M = 4.98$, $SD = 1.40$).[3]

[3]For the scenario check, responses were rated on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*; $N = 115$). All mean values were significantly greater than 4 at an alpha value of .01(all of the p values were less than .001).

Sample

A total of 972 responses was obtained (485 for positive scenario, 487 for negative scenario). Of those responses, 68 from the positive scenario and 54 from the negative scenario were eliminated because they lacked website names, had duplicate IP addresses, or were incomplete, yielding a usable sample of 417 for the positive scenario and 433 for the negative scenario. Roughly 50% of the samples were obtained from questionnaire forms submitted online.

Regarding respondent demographics, the male-to-female ratio of the sample was 2:1, and the majority (80%) was students younger than 24 years. These ratios appear reasonable since male students are the main consumers of game products. Roughly 84% of respondents had less than $300 disposable income per month, and over half (60%) of the respondents averaged more than 4 hr per day online.

Measures

Scales for measuring respondent perceptions were obtained from previous studies and were carefully adapted to conform to the scenarios. All questionnaire items were measured using a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Table 1 lists the measures used in the present study, as well as their means and standard deviations.

Sense of virtual community (SOVC) was assessed using a 22-item scale developed by Blanchard (2007). Respondents answered the questions prior to reading the scenarios. To assess the influence of online product comments, we employed eight items from Gilly et al.'s (1998) scale dealing with the perceived influence of eWOM (PIEW). In addition, four items for measuring attitude (ATT), and three items for gauging purchase intentions (PINT) were obtained from Bagozzi and Dholakia (2002), and Perugini and Bagozzi (2001). Respondents answered questions regarding their PIEW, ATT, and PINT following reading the comments regarding the target product.

Results

Factor Structure of SOVC

To identify the factor structures of SOVC, the samples for the two scenarios were combined and subjected to exploratory factor analysis (EFA) with maximum likelihood estimation. Promax rotation was used to consider

Table 1

Summary of Measurement Scales

	Positive eWOM ($N = 417$)		Negative eWOM ($N = 433$)	
Constructs/measures	*M*	*SD*	*M*	*SD*
SOVC1: I feel at home in this group.	4.66	1.02	4.59	0.98
SOVC2: I can recognize the names of most members in this group.	2.74	1.40	2.67	1.33
SOVC3: Many other group members know me.*	2.35	1.31	2.17	1.21
SOVC4: I care about what other members think of my actions.	2.85	1.47	2.98	1.43
SOVC5: I have influence over what this group is like.	2.35	1.32	2.27	1.23
SOVC6: If there is a problem in this group, there are members here who can solve it.	4.36	1.22	4.34	1.21
SOVC7: Members of this group share the same values.*	4.06	1.24	3.75	1.32
SOVC8: I think this group is a good place for me to be a member.	4.40	1.26	4.34	1.16
SOVC9: Other members and I want the same things from the group.	4.31	1.21	4.22	1.17
SOVC10: Members in this group generally get along with each other.*	3.98	1.28	3.76	1.22
SOVC11: It is very important to me to be a member of this group.	3.72	1.35	3.71	1.27
SOVC12: I expect to stay in this group for a long time.	4.11	1.37	4.13	1.30
SOVC13: I anticipate how some members will react to certain questions or issues in this group.	4.34	1.20	4.40	1.09
SOVC14: I get a lot out of being in this group.	4.32	1.26	4.34	1.14
SOVC15: I have had questions that have been answered by this group.	4.55	1.28	4.51	1.29
SOVC16: I have gotten support from this group.	3.76	1.32	3.77	1.30
SOVC17: Some members of this group have friendships with each other.	4.06	1.33	4.16	1.20
SOVC18: I have friends in this group.	4.27	1.37	4.15	1.41
SOVC19: Some members of this group can be counted on to help others.	4.34	1.16	4.37	1.16

Table 1 *Continued*

Constructs/measures	Positive eWOM ($N = 417$)		Negative eWOM ($N = 433$)	
	M	*SD*	*M*	*SD*
SOVC20: I feel obligated to help others in this group.	4.01	1.22	3.91	1.21
SOVC21: I really like this group.	4.38	1.19	4.39	1.10
SOVC22: This group means a lot to me.	3.90	1.34	3.85	1.32
PIEW1: These comments provide some new information about "GaMe."	4.09	1.15	4.22	1.16
PIEW2: These comments will influence my choice about buying "GaMe."*	3.82	1.36	4.49	1.28
PIEW3: These comments mention some things I had not considered.	3.72	1.21	3.77	1.34
PIEW4: These comments will change my mind about buying "GaMe."*	3.80	1.32	4.46	1.22
PIEW5: These comments help me make a decision about buying "GaMe."*	3.94	1.32	4.42	1.27
PIEW6: These comments are influential for me on buying "GaMe."*	3.89	1.33	4.54	1.18
PIEW7: These comments have influence on the factors about buying "GaMe."*	3.75	1.26	4.44	1.23
PIEW8: These comments are important to whether I buy "GaMe" or not.*	3.71	1.35	4.30	1.33
ATT1: "GaMe" is appealing to me.*	3.75	1.29	2.79	1.28
ATT2: I really like "GaMe."*	3.58	1.28	2.72	1.24
ATT3: It would be very desirable to have "GaMe."*	3.59	1.23	2.68	1.20
ATT4: I hold a positive evaluation toward "GaMe."*	3.73	1.21	2.79	1.19
PINT1: I intend to buy "GaMe."*	3.27	1.32	2.47	1.16
PINT2: I have a plan to buy "GaMe."*	3.20	1.31	2.46	1.18
PINT3: The intention of buying "GaMe" to me is intense.*	3.04	1.33	2.39	1.18

Note. SOVC = sense of virtual community; PIEW = perceived influence of electronic word of mouth; ATT = attitude toward product; PINT = purchase intention; GaMe = the name of fictional game used in the scenario of the questionnaire.
*Statistically significant at $\alpha = .05$ with the *t* test of the difference in means between the scenarios of positive and negative eWOM.

the interfactor correlations.[4] Three factors with eigenvalues exceeding 1 were extracted, while two items (SOVC1 and SOVC18) were deleted for having factor loadings below .40. The remaining 20 items were used to implement confirmatory factor analysis (CFA) using the factor structures obtained from EFA. Four items (SOVC6, SOVC7, SOVC9, and SOVC10) were deleted owing to their standardized factor loadings falling below .60.[5] The final CFA model was further applied to situations of both positive and negative eWOM.

Regarding the meanings of the three SOVC factors, according to the loaded items of each factor, the first SOVC factor is labeled *Emotional Linkages* (EL), the second is *Anticipated Support* (AS), and the third is *Membership and Influence* (M&I). Compared to the model of SOC proposed by McMillan and Chavis (1986), the meaning of EL resembles the concept of *shared emotional connection*, which interprets the affective component related to community consciousness. The meaning of AS resembles that of *reinforcement of needs*, which explains the feeling that a member hopes that other community members will solve their problems. Finally, the meaning of M&I combines the concept of *membership* and *influence* into a single construct, and explains the feelings of belonging to, identifying with, and mattering to a community. These factors are identical to the findings of Blanchard and Markus (2004) regarding the origins of SOVC (i.e., recognition of members, exchange of support, emotional attachment, personal relationships with members, sense of obligation, self-identity, identification with others).

Table 2 lists the results of standardized factor loadings of the three-factor SOVC model. All factor loadings for the two scenarios were significant ($p < .001$), with values ranging from .63 to .87 for EL; .67 to .74 for AS; and .60 to .88 for M&I. In the subsequent structural equation model (SEM) analysis, the scores of three SOVC factors were averaged using the standardized factor loadings of respective items as weights. Additionally, all Cronbach's alpha and composite reliability (CR) of the three SOVC factors showed acceptable reliabilities (range = .74–.93).[6] Furthermore, the convergent validity can be

[4]McMillan and Chavis (1986) defined *sense of community* (SOC) as having four key elements: membership; influence; integration and fulfillment of needs; and shared emotional connection. Meanwhile, these four elements interrelated via a self-reinforcing circle. Blanchard and Markus (2004) extended the concept of SOC to virtual communities and named this extension *sense of virtual community* (SOVC). Blanchard (2007) further devised the scale of SOVC based on McMillan and Chavis (1986) and their observations of online multiple sports newsgroups. Thus, the three SOVC factors are expected to correlate.

[5]Tabachnick and Fidell (2007) proposed a factor loading of .55 (30% of variance) as an appropriate boundary for a scale in social science research. This study used a higher value of 0.6 (i.e., 36% of variance) as the value of item-deleted decision.

[6]The concept of composite reliability resembles Cronbach's alpha for assessing internal consistency reliability and is calculated based on the factor loadings and error variances of loaded indicators (Fornell & Larcker, 1981). Bagozzi and Yi (1988) suggested .60 as the minimum value of composite reliability.

Table 2

Standardized Factor Loadings and Correlations of the Three-Factor SOVC Model

Variable	EL	AS	M&I
SOVC2	—	—	0.81/0.88
SOVC3	—	—	0.82/0.77
SOVC4	—	—	0.62/0.60
SOVC5	—	—	0.76/0.80
SOVC8	0.77/0.71	—	—
SOVC11	0.72/0.70	—	—
SOVC12	0.74/0.80	—	—
SOVC13	—	0.71/0.69	—
SOVC14	0.85/0.80	—	—
SOVC15	0.68/0.68	—	—
SOVC16	0.63/0.70	—	—
SOVC17	—	0.71/0.67	—
SOVC19	—	0.71/0.74	—
SOVC20	0.73/0.66	—	—
SOVC21	0.87/0.83	—	—
SOVC22	0.83/0.81	—	—
Cronbach's α	0.93/0.92	0.74/0.74	0.82/0.80
AVE	0.58/0.56	0.51/0.49	0.57/0.59
CR	0.92/0.92	0.76/0.75	0.84/0.85
Correlations	**EL**	**AS**	**M&I**
EL	—	—	—
AS	0.76/0.53	—	—
M&I	0.33/0.35	0.34/0.26	—

Note. SOVC = sense of virtual community; EL = emotional linkages; AS = anticipated support; M&I = membership and influence; AVE = average variance extracted; CR = composite reliability. Numbers to the left of the slash are the results of the positive eWOM scenario, numbers to the right of the slash are the results of the negative eWOM scenario. All factor loadings are statistically significant at $\alpha = .001$. Six items (SOVC1, SOVC6, SOVC7, SOVC9, SOVC10, and SOVC18) were excluded because their factor loadings did not satisfy the suggested minimum values in exploratory factor analysis (.40) and confirmatory factor analysis (.60).

$$\mathrm{AVE} = \sum_{i=1}^{p} \lambda_i^2 \Big/ \left(\sum_{i=1}^{p} \lambda_i^2 + \sum_{i=1}^{p} \mathrm{Var}(\varepsilon_i) \right); \quad \mathrm{CR} = \left(\sum_{i=1}^{p} \lambda_i \right)^2 \Big/ \left(\left(\sum_{i=1}^{p} \lambda_i \right)^2 + \sum_{i=1}^{p} \mathrm{Var}(\varepsilon_i) \right),$$

where λ_i represents standardized factor loading of indicator i (i = 1,2, . . . , P); Var(ε_i) represents standardized error variance of indicator i (i = 1,2, . . . , P).

considered adequate, while the average variance extracted (AVE) exceeds the suggested minimum value of .50 (Fornell & Larcker, 1981), except for AS in the negative scenario, which had an AVE of only .49.

Correlations among the three SOVC factors can be employed to examine their discriminant validity. The correlations in the positive eWOM scenario between EL and AS, $r(415) = .76$, $p < .001$; EL and M&I, $r(415) = .33$, $p < .001$; and AS and M&I, $r(415) = .34$, $p < .001$); and in the negative eWOM scenario between EL and AS, $r(431) = .53$, $p < .001$; EL and M&I, $r(431) = .35$, $p < .001$; and AS and M&I, $r(431) = .26$, $p < .001$, are all significantly smaller than 1, indicating discriminant validity.[7]

To summarize, all of the results suggest that the three-factor SOVC model exhibits good reliability and validity. Model A in Table 3 shows the model fitness of the three-factor SOVC model, and reveals good fit in both scenarios.

Evaluations of the Measurement Model

To evaluate the measurement quality, the three-factor SOVC and other constructs (i.e., PIEW, ATT, PINT) were combined and subjected to a CFA procedure. We removed two items in PIEW (PIEW1 and PIEW3) because one of the standardized factor loadings in one of the two scenarios was less than .60. The correlation analysis indicates that three items (i.e., ATT1, ATT2, PINT1) had high linear correlations among other items ($r > .86$). To avoid multicollinearity within the SEM analysis, these items were excluded from the analysis.

Table 4 shows that all factor loadings were significant ($p < .001$; SOVC, range = .36–.92; PIEW, range = .80–.94; ATT, range = .82–.91; PINT, range = .87–.96). Moreover, the values of Cronbach's alpha and CR all showed acceptable reliabilities (range = .69–.95), and the values of AVE all exceeded the suggested minimum value of .50. Thus, convergent validity is confirmed (Fornell & Larcker, 1981). All of the estimated correlations among constructs were significantly smaller than 1, indicating discriminant validity.[8] The fit statistics of Model B in Table 3 indicate acceptable model fit. This indicates that the measurement model possesses excellent reliability and validity.

[7]Correlations between EL and AS: positive scenario, $\chi^2(1, N = 417) = 14.97$, $p < .001$; negative scenario, $\chi^2(1, N = 433) = 54.47$, $p < .001$. Correlations between AS and M&I: positive scenario, $\chi^2(1, N = 417) = 153.52$, $p < .001$; negative scenario, $\chi^2(1, N = 433) = 326.94$, $p < .001$. Correlations between EL and M&I: positive scenario, $\chi^2(1, N = 417) = 511.18$, $p < .001$; negative scenario, $\chi^2(1, N = 433) = 403.94$, $p < .001$.

[8]All chi-square values exceeded 10 with 1 *df*, and their *p* values were significant at .001.

Table 3

Goodness of Fit Statistics for Structural Equation Models

Fit indexes	Model A	Model B	Model C	Criteria
df	88/83	55/54	390/389	—
χ^2	211.94/240.18	119.01/110.26	977.21/848.36	—
Normed χ^2	2.41/2.89	2.16/2.04	2.51/2.18	1–3
RMSEA	0.058/0.066	0.053/0.049	0.060/0.052	<.08 (McDonald & Ho, 2002)
GFI	0.94/0.94	0.96/0.96	0.87/0.89	>.90 (Reisinger & Turner, 1999)
AGFI	0.91/0.89	0.93/0.94	0.83/0.86	.80–.90 (Doll, Xia, & Torkzadeh, 1994)
CFI	0.99/0.98	0.99/0.99	0.98/0.98	>.90 (McDonald & Ho 2002)
NNFI	0.98/0.98	0.99/0.99	0.98/0.98	>.90 (Reisinger & Turner, 1999)

Note. Numbers to the left of the slash are the results of the positive electronic word-of-mouth (eWOM) scenario; numbers to the right of the slash are the results of the negative eWOM scenario. Model A = three-factor SOVC model; Model B = measurement model for research constructs; Model C = Ping's (1996) interactive structural equation model; normed χ^2 = the ratio of chi-square value and its degree of freedom; RMSEA = root mean square error of approximation; GFI = goodness-of-fit index; AGFI = adjusted GFI; CFI = comparative fit index; NNFI = nonnormed fit index.

Tests of Research Hypotheses

To examine the proposed hypotheses, a two-step interactive SEM using Ping's (1996) estimation procedure was applied to assess the direct effects of PIEW on ATT (Hypotheses 1a and 1b) and PINT (Hypotheses 2a and 2b), as well as the moderating effects of SOVC on the relationships of PIEW with ATT and PINT (Hypotheses 3a and 3b; see Figure 1). This method can quantify the effects of interaction between latent constructs not achievable via traditional ANOVA or multiple-sample SEM. Figure 1 shows the estimated and standardized path coefficients of the interactive SEM in the situations of positive and negative eWOM. Model C in Table 3 lists the model fit indexes of the interactive SEM of Ping (1996).

Effects of eWOM on attitude. Hypotheses 1a and 1b proposed that the perceived influence of eWOM would positively and negatively affect online member attitudes toward a reviewed product in the positive and negative

Table 4

Standardized Factor Loadings for Ping's (1996) Measurement Model

Variable	SOVC	PIEW	ATT	PINT
EL	0.89/0.92	—	—	—
AS	0.88/0.75	—	—	—
M&I	0.36/0.39	—	—	—
PIEW2	—	0.82/0.86	—	—
PIEW4	—	0.90/0.90	—	—
PIEW5	—	0.88/0.85	—	—
PIEW6	—	0.94/0.91	—	—
PIEW7	—	0.83/0.88	—	—
PIEW8	—	0.80/0.84	—	—
ATT3	—	—	0.84/0.91	—
ATT4	—	—	0.82/0.89	—
PINT2	—	—	—	0.96/0.96
PINT3	—	—	—	0.87/0.93
Cronbach's α	0.72/0.69	0.95/0.95	0.81/0.90	0.91/0.94
AVE	0.57/0.52	0.74/0.76	0.69/0.81	0.84/0.89
CR	0.78/0.75	0.95/0.95	0.81/0.90	0.91/0.94
Correlations	SOVC	PIEW	ATT	PINT
SOVC	—			
PIEW	0.41/0.35	—		
ATT	0.50/0.26	0.65/–0.31	—	
PINT	0.38/0.21	0.63/–0.27	0.86/0.81	—

Note. SOVC = sense of virtual community; PIEW = perceived influence of electronic word of mouth (eWOM); ATT = attitude toward product; PINT = purchase intention; EL = emotional linkages; AS = anticipated support; M&I = membership & Influence; AVE = average variance extracted; CR = composite reliability. Numbers to the left of the slash are the results of the positive eWOM scenario; numbers to the right of the slash are the results of the negative eWOM scenario. All factor loadings are statistically significant at $\alpha = .001$. Two items (PIEW1 and PIEW3) were excluded for factor loadings not satisfying the suggested minimum value of .06 in confirmatory factor analysis, and three items (ATT1, ATT2, and PINT1) were removed as a result of high correlations with other items. $\mathrm{AVE} = \sum_{i=1}^{p} \lambda_i^2 \Big/ \left(\sum_{i=1}^{p} \lambda_i^2 + \sum_{i=1}^{p} \mathrm{Var}(\varepsilon_i) \right)$; $\mathrm{CR} = \left(\sum_{i=1}^{p} \lambda_i \right)^2 \Big/ \left(\left(\sum_{i=1}^{p} \lambda_i \right)^2 + \sum_{i=1}^{p} \mathrm{Var}(\varepsilon_i) \right)$, where λ_i represents standardized factor loading of indicator i (i = 1,2, . . . , P); $\mathrm{Var}(\varepsilon_i)$ represents standardized error variance of indicator i (i = 1,2, . . . , P).

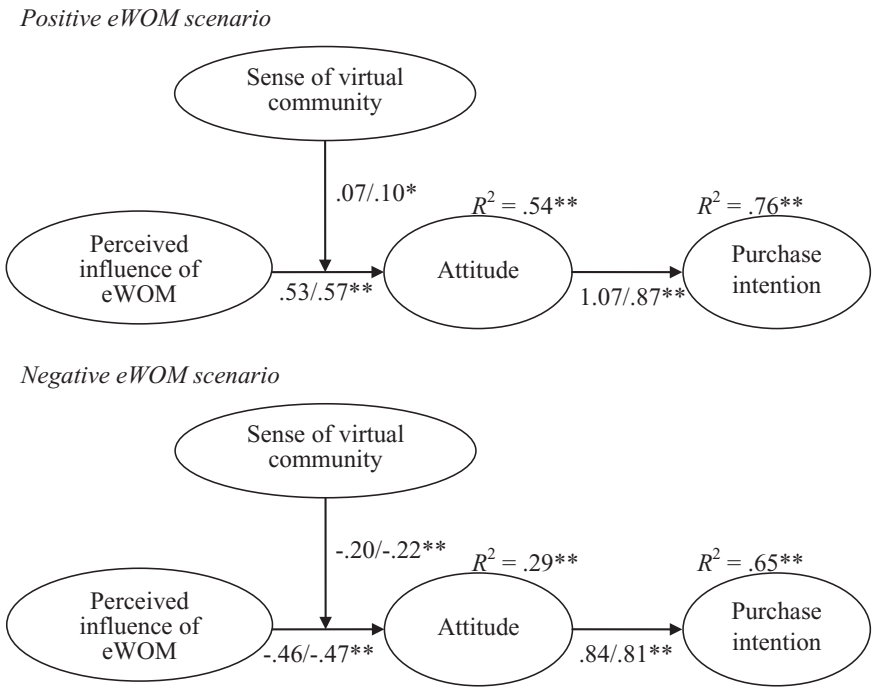

Figure 1. Estimated path coefficients of the interactive structural equation model using Ping's (1996) method. Numbers to the left of the slash are unstandardized values; numbers to the right of the slash are standardized values. eWOM = electronic word of mouth. *$p < .05$. **$p < .01$.

eWOM scenarios, respectively. The analytical results show that the standardized path coefficients in positive eWOM ($\beta = .57$), $t(414) = 11.05$, $p < .001$; and negative eWOM ($\beta = -.47$), $t(430) = -8.96$, $p < .001$, were all significant in the expected direction, thus supporting Hypotheses 1a and 1b.

Effects of attitude on purchase intention. Hypotheses 2a and 2b posited that attitude would positively impact purchase intention in both the positive and negative scenarios. The analytical results indicate that the standardized path coefficients from attitude to purchase intention are positive numbers and are statistically significant: positive scenario ($\beta = .87$), $t(416) = 18.94$, $p < .001$; negative scenario ($\beta = .81$), $t(432) = 19.85$, $p < .001$.[9] Thus, Hypotheses 2a and 2b are supported.

[9]Attitude and purchase intention were closely correlated (positive eWOM, $\beta = .87$; negative eWOM, $\beta = .81$). The correlations may be unusually high compared with past studies. However, Kim and Hunter's (1993) meta-analysis identified a strong average correlation between attitude and purchase intention—mean $r(92) = .87$, 95% confidence interval (CI), $.83 < r < .91$—after eliminating methodological artifacts. The magnitude of the correlation increases when

Moderating effects of SOVC. Hypotheses 3a and 3b assume that an SOVC reinforces the relationship between the perceived influence of eWOM and consumer attitudes in both positive and negative eWOM scenarios. As shown in Figure 1, standardized path coefficients in the positive eWOM scenario ($\beta = .10$), $t(414) = 2.40$, $p = .02$; and negative eWOM scenario ($\beta = -.22$), $t(430) = -4.60$, $p < .001$, are both significant in the correct direction. Thus, Hypotheses 3a and 3b are supported.

Since the overall moderating effect of SOVC was significant in both scenarios, this study further explores the individual moderating effect for the three factors of SOVC (i.e., EL, AS, M&I) and their scale of that effect. We used another simple interactive SEM technique proposed by Ping (1995) to test individual moderating effects. Model I in Table 5 presents the overall moderating effect of SOVC using Ping's method. The analytical results demonstrate that this method yields similar estimates to that of Ping (1996).

Regarding the individual moderating effect, the two scenarios yielded different and interesting findings. Models B, C, and D in Table 5 indicate that for positive eWOM, the moderating effects of EL ($\beta = .09$), $t(414) = 2.21$, $p = .03$; and M&I ($\beta = .10$), $t(414) = 2.17$, $p = .03$, were significant; but AS was not ($\beta = .08$), $t(414) = 1.78$, $p = .08$. Meanwhile, the same models indicate that for negative eWOM, the moderating effects of EL ($\beta = -.22$), $t(430) = -4.70$, $p < .001$; and AS ($\beta = -.24$), $t(430) = -4.60$, $p < .001$, were significant; but M&I was not ($\beta = -.08$), $t(430) = -1.63$, $p = .10$.

Discussion

The value and influence of eWOM differs from that of offline WOM because consumers cannot directly examine source credibility and their similarity with online informants. Brown et al. (2007) proposed that the relationship and interaction between online communities and their members substitute for the relationship between individuals in assessing the influence of eWOM. The analytical results resemble those of Brown et al. (2007), and indicate that consumer SOVC reinforces the influence of eWOM on product attitudes and purchase intention.

Based on the accessibility–diagnosticity model, consumer consciousness of a good relationship between an online community and its members enhances the diagnosticity and influence of online product comments

attitudinal relevance is higher; for high attitudinal relevance, mean $r(77) = .86$, 95% CI, $.81 < r < .91$. In this study, the strength of the match between attitudinal and behavioral elements was high (see Kim & Hunter, 1993, p. 341). Thus, the high correlation between attitude and intention appears reasonable.

Table 5

Individual Moderating Effect of the Three SOVC Factors

		Effect constructs			
		Positive eWOM		Negative eWOM	
	Cause constructs	ATT	PINT	ATT	PINT
Model I	PIEW	0.54/0.58 (11.20)**	—	–0.45/–0.46 (–9.00)**	—
	SOVC	0.30/0.26 (5.46)**	—	0.45/0.37 (6.57)**	—
	SOVCPIEW	0.09/0.12 (2.70)**	—	–0.21/–0.23 (–4.44)**	—
	ATT	—	1.07/0.87 (19.02)**	—	0.84/0.81 (19.91)**
Model II	PIEW	0.54/0.58 (12.15)**	—	–0.43/–0.45 (–8.82)**	—
	EL	0.28/0.26 (5.63)**	—	0.45/0.35 (6.63)**	—
	ELPIEW	0.07/0.09 (2.21)*	—	–0.21/–0.22 (–4.70)**	—
	ATT	—	1.07/0.87 (18.81)**	—	0.84/0.81 (19.92)**
Model III	PIEW	0.55/0.60 (11.13)**	—	–0.41/–0.43 (–7.92)**	—
	AS	0.30/0.22 (4.60)**	—	0.38/0.28 (4.62)**	—
	ASPIEW	0.08/0.08 (1.78)	—	–0.22/–0.24 (–4.60)**	—
	ATT	—	1.07/0.87 (18.85)**	—	0.84/0.80 (19.68)**
Model IV	PIEW	0.62/0.67 (13.01)**	—	–0.27/–0.28 (–6.02)**	—
	M&I	0.13/0.14 (3.17)*	—	0.43/0.39 (7.50)**	—
	M&IPIEW	0.07/0.10 (2.17)*	—	–0.08/–0.08 (–1.63)	—
	ATT	—	1.08/0.89 (18.96)**	—	0.83/0.81 (20.00)**

Note. eWOM = electronic word of mouth; EL = emotional linkages; AS = anticipated support; M&I = membership and influence; PIEW = perceived influence of eWOM; SOVC = sense of virtual community; ATT = attitude toward product; PINT = purchase intention; SOVCPIEW = interaction between SOVC and PIEW; ELPIEW = interaction between EL and PIEW; ASPIEW = interaction between AS and PIEW; M&IPIEW = interaction between M&I and PIEW. Numbers to the left of the slash are unstandardized values; numbers to the right of the slash are standardized values; the number in parentheses is the *t* value. All models were analyzed using Ping's (1995) method. Model I models the overall moderating effect of SOVC with EL, AS, and M&I as indicators; meanwhile, Models II, III, and IV model the individual moderating effects of EL, AS, and M&I, respectively.
*$p < .05$. **$p < .01$.

(Feldman & Lynch, 1988; Herr et al., 1991). Particularly in the case of negative comments, the reinforced (interactive) effect of SOVC is stronger than in the positive situation.[10] This result resembles the findings of Herr et al. that extremely negative product comments have more ability (or diagnosticity) to recognize product quality than do positive and neutral product comments.

Additionally, the three factors of SOVC (i.e., EL, AS, M&I) were explored and confirmed, and this study also assessed the individual moderating effect for the three SOVC factors. The results are interesting in that the source of the moderating effect for SOVC differs between positive and negative eWOM. Specifically, the moderating effect of SOVC primarily comes from EL and M&I, but not from AS for positive eWOM. However, the effect primarily derives from EL and AS, but not from M&I for negative eWOM. This finding implies that positive and negative eWOM differ intrinsically.

In this study, M&I resembles the feeling that members identify with and are influenced by an online community, while AS resembles the feeling that members view an online community as a product expert. When consumers face positive eWOM regarding unfamiliar products (e.g., the game software in this study), they attempt to seek information from close friends, rather than remote experts to avoid expectation incongruity because they may see experts as more likely than friends to be paid advertisers of the product (Bone, 1995; Brown & Reingen, 1987). Thus, the moderating effect derives from M&I, but not AS for positive eWOM. Meanwhile, when consumers face negative eWOM regarding unfamiliar products, they see product criticisms from trustable and capable experts as more believable than those from familiar friends because they believe that experts are more capable of identifying product drawbacks than are familiar friends. Thus, the moderating effect derives from AS, but not M&I for negative eWOM.

In conclusion, this investigation links three critical fields of research; namely, sociopsychology in community psychology, marketing in WOM communication, and consumer psychology in attitude and intention within a cyberspace environment. The research results reveal the influence of eWOM communications on consumer attitudes and behavior in online societies when considering the social power of virtual community. Based on the perspective of virtual consumption communities advocated by Kozinets (1999), this study empirically supports virtual communities exerting social leverage on consumer behaviors. As discussed previously, assessing the influence of

[10]The absolute difference in path coefficient of interaction between positive and negative eWOM was tested using Paternoster, Mazerolle, and Piquero's (1998) method, which uses the following formula: $Z = b_1 - b_2 \Big/ \sqrt{SE_{b1}^2 + SE_{b2}^2}$. In result, the test is significant ($\beta = 0.11$, $z = 2.46$, $p = .01$).

WOM communication online differs from assessing its influence offline in that virtual communities replace individuals as the focus for assessing information value (Brown et al., 2007). Researchers of eWOM should pay more attention to the interaction between websites and their contents. Finally, since the newly developed SOVC scale needed empirical evidence in its validity and application (Blanchard, 2007), the present study also verifies the structure of SOVC in online game communities.

This study suggests several management implications. First, online brand community developers should utilize the power of online communities to cultivate and maintain harmonious relationships among community members, thus enhancing the development of a strong SOVC. Online community developers should establish a set of norms or "netiquette" to avoid destroying community harmony, and to ensure member emotional safety while participating in the community. Developers can also encourage members to initiate activities involving common topics, and empower them to control community development by permitting members to appraise the behavior or performance of other members. Finally, a mentoring scheme can be established by which veterans are assigned to newcomers to facilitate the process of learning and adopting online community culture.

Second, online marketers should realize the influence of eWOM, since the Internet provides excellent access to information. Online marketers can benefit from the diffusion of positive eWOM via herding effects, and such abundant information helps potential consumers positively evaluate the product (Huang & Chen, 2006). Also, a recommendation system or reward program can promote positive eWOM.

However, the influence of eWOM runs in two directions, and negative comments can also flood online discussion forums. In contrast to WOM, eWOM can be preserved perpetually in online forums as a website ingredient. Additionally, since cyberspace provides complainers with a place to vent negative emotions (Halstead, 2002), it may encourage negative feedback over positive. Still, negative feedback provides an opportunity for online marketers to recognize product defects or inefficiencies in the consumption process and respond appropriately. Online marketers should actively collect and systematically manage negative product comments, particularly those in highly cohesive online communities.

The present study has three limitations that suggest opportunities for future research. First, this study only considered one type of product (i.e., game software). Future investigations should consider different products (e.g., durable goods) or services (e.g., haircuts) to better understand the moderating effect of online communities. Second, this study only considered one decision situation (i.e., initial purchase). Future studies could consider other decision situations, such as decisions regarding switching brands.

Finally, the model in this study used purchase intention—rather than actual purchase behavior—as one of the effect constructs. Future research should examine the interactive effect between perceived influence of eWOM and SOVC on actual purchase behavior.

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