Disentangling the Effects of Social Network Density on Electronic Word-of-Mouth (eWOM) Intention

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A widely accepted notion in diffusion literature is that individuals’ word-of-mouth behavior is constrained by the properties of social structures (e.g., tie strength, positions in a network) they belong to. Although many studies have indeed confirmed the existence of such social influence, little is known about how the social structural effects are produced and work at a psychological level. This study attempts to present how one’s electronic word-of-mouth (eWOM) intention is shaped by 2 key factors—the valence of product-related information and the social coherence of the communication network in which s/he belongs. To understand the process through which the network structures moderate the impact of information valence on eWOM intention, 2 different moderation processes—a) mediated moderation and b) moderated mediation—were tested in a $2 \times 2$ factorial experiment. The experimental results supported the moderated mediation model, and the implications of the results were discussed.

do:10.1111/j.1083-6101.2009.01444.x

The role of individuals in information diffusion has been studied extensively for decades (Rogers, 2003), and recent developments in peer-to-peer communication technologies have revivified scholarly interest in the mysterious process of electronic word-of-mouth (eWOM; e.g., e-mail, BBS, blogs). The formation of eWOM intention has been studied in two different ways. While some previous studies have characterized eWOM as an outcome of the psychological motives and antecedents such as opinion leadership or innovativeness (e.g., Henning-Thurau, Gwinner, Walsh, & Gremler, 2004; Phelps, Lewis, Mobilio, Perry, & Raman, 2004; Sun, Youn, Wu, & Kuntaraporn, 2006), others viewed it as a function of the strength and distribution patterns of social ties among individuals on the Internet (e.g., Steyer, Garcia-Bardidia, & Quester, 2006; Vilpponen, Winter, & Sundquist, 2006).

Since Granovetter’s (1974) groundbreaking research, a number of studies across disciplines have confirmed that individuals’ WOM behavior is influenced by the
properties of social relationships among them, which includes tie strength (e.g., Brown & Reingen, 1987), positions in a network (e.g., Weimann, 1982), and the network structures (e.g., Burt, 1987). The previous studies, however, focused on testing whether social structures constrain or shape individuals’ WOM behaviors without directly inquiring how such structural influence works at a psychological level. Do social structures directly affect individuals’ motivation to share information? Or do social structures indirectly affect motivation by way of influencing how individuals judge gains/losses from the act of information-giving? The psychological mechanisms underlying the social structural effects have remained untapped, which made it difficult to explain systematically why individuals are more likely to engage in WOM under certain social circumstances than others.

As widely acknowledged, the Internet allows people to get involved with far more diverse social settings than ever before, from close-knit groups consisting of family members and friends to huge communities involving countless anonymous participants. Thus, it becomes more important to understand clearly how individuals’ motivation to communicate with one another varies depending on the various social settings available online, which would eventually determine the process and outcome of information diffusion. The current study is an exploratory attempt to illuminate the process through which individuals’ eWOM motivation interacts with social structural environment, represented as an online social network consisting of multiple individuals. Employing information with different valence (positive vs. negative), this study examines how the effects of information valence on eWOM intention vary as a function of the density of a social network, which indicates the extent to which individuals in a network are close to one another (Wasserman & Faust, 1994). By building and testing two competing models illustrating different ways social network density influences eWOM intention—a) mediated moderation and b) moderated mediation, this study attempts to explain more clearly how eWOM intention is formed on the intersection of psychological and social dimensions.

Electronic Word-of-Mouth in a Multiagent Setting

More than a decade ago, Frenzen and Nakamoto (1993) conducted a pioneering study to examine how one’s WOM intention is influenced not only by the characteristics of the information to be transmitted, but also by the sender-receiver relationship strength. Through a series of experiments, they found that information associated with a high opportunity cost of sharing it (e.g., 25% discount only for the first 10 customers) lowered WOM intention only when the information sender was weakly tied to the receiver, but did not affect it when they were strongly tied. This revealed that when deciding to give information, people considered not only its value or characteristics, but also to whom it would be given, since the aspiration to obtain social approval usually underlies such an act (Hirschman & Wallendorf, 1982). Their study, however, focused only on the one-to-one information transfer, which limits its
application to the many-to-many interaction on the Internet. A question that follows is whether the same patterns would be found when more than two individuals are involved as in an online community.

Sociologists have long recognized that group interaction is different from a dyadic interaction in terms of the actors’ perception of the interaction situation (Bonacich, 1990). In a dyad, each person is socially bound to reciprocate to the other. The existence of a third actor as in a triad, however, creates a different situation, in which one’s behavior is dependent on the relationship between the other two. In a situation where three actors, X, Y, and Z, interact, for example, if Y and Z are socially close or agree on an issue, X may be pressured to be congruent with the others’ behavior or opinion, while this would not be the case if Y and Z were not close or disagreed on the issue (Coleman, 1988; Granovetter, 1973). In short, N-person interaction (N > 2) is based on one’s response to a group of N-1 individuals who are interrelated, while dyadic interaction depends on the direct relationship strength between the two as found by Frenzen and Nakamoto (1993).

The discussions above imply that unlike the one-to-one information transfer, one’s eWOM intention in the N-person interaction on the Internet may not depend on how close the information sender is with potential receivers, but on whether s/he perceives the N-1 others as a coherent entity or separate recipients. As a structural indicator of this entitativity of a group, this study examines the density of social connections existing in a personal social network, termed egocentric network density. Egocentric network refers to a personal social network defined by the focal individual (ego hereafter): The information of N-1 members (alters hereafter) and the relationships among them in a network are reported by the ego.

Marsden (1990) defines network density as “the mean strength of connections among units in a network” (p. 453), which reflects the overall proportion/strength of connections between individuals. As shown in Figure 1, the dense egocentric network means a closed or integrated network, in which the alters know each other well, while the nondense network is an open or radial network where the alters hardly know each other. Note that egocentric network density counts only the ties among the alters while excluding the direct ego-alter ties. That is, egocentric network density does not indicate how close the ego and the alters are in a network, but the extent to which the alters are interconnected (Scott, 2000). The egocentric network has been widely used by sociologists to study the structures of communities and social support exchange (Wasserman & Faust, 1994). A virtue of this approach is that the network density can be measured together with other individual characteristics by using random surveys (Wellman, Frank, Espinoza, Lundquist, & Wilson, 1991).

Then, how does social network density affect eWOM intention? According to the social identity theory (Tajfel, 1978), individuals derive their identity by differentiating the group in which they belong from others. As the social ties among people in a group get stronger, it becomes more likely for the group to be perceived as a concrete entity, clearly distinguishable from people outside. In turn, the clear distinction between in and out-group may make individuals care more about the interest of the
Figure 1  Dense vs. Nondense Network. Note: In the network on the left, alters are densely connected with one another, which means that more connections among individuals within the network exist than to people outside. In the network on the right, in contrast, alters have more connections with others outside the egocentric network than those within the network. This means they hardly know one another, even if they are connected to ego.

group rather than personal gains/losses. This would lead them to the exchange norm of *communal-sharing*—“people give as they can and take as they need” (McGraw & Tetlock, 2005, p. 3), which means people would be willing to give information without caring much about the personal outcomes of the act. If the boundary of a group is too blurry to tell in from out-group members, individuals may not perceive themselves as parts of a concrete group entity, and the norm of exchange in this situation may become *tit-for-tat reciprocity* or *equality matching* rather than communal sharing (McGraw & Tetlock, 2005). Consequently, individuals may become relatively more sensitive to the personal gains/losses from giving information, which would make them pay more attention to the traits/value of information, and possibly lower their eWOM intention.

**Modeling the Structural Effects: Mediated Moderation vs. Moderated Mediation**

Like gift-exchange, providing resources (e.g., information) to others always involves conscious perception/evaluation of the value/traits of the resources (Robben & Verhallen, 1994), since giving a resource with low value might return negative social consequences (e.g., losing a friend). This means one’s eWOM intention is formed through the *mediation* of his/her information value perception, which might be influenced by its characteristics such as valence. Hence, let’s assume a simple mediation process, first—a) information valence (IV hereafter), b) information value perception/evaluation (EV hereafter), and c) eWOM intention (WI hereafter). Then, social network density (SD hereafter) was selected as the key moderator, because it shows individuals’ perceptions of a surrounding social environment consisting of other individuals, which might affect their perception of information value and communicative motivation. Psychologists have theorized there are two
different ways a moderator, social network density in this case, is related to the mediation process (Baron & Kenny, 1986; Muller, Judd, & Yzerbyt, 2005).

First, SD may moderate the effects of IV on WI by either influencing IV’s effects on EV, the effects of EV on WI, or both. In this case, SD is said to moderate the effects of IV on WI through EV, which is called mediated moderation. Second, SD may not directly moderate the effects of IV on WI, but moderate the mediation process itself through which IV’s effects are produced, which is called moderated mediation. In this case, what varies as a function of SD is people’s information value perception, EV, which affects WI. Figure 2 is a graphic illustration of the two cases.

**Figure 2** Mediated Moderation vs. Moderated Mediation. *Note: In the mediated moderation model on the left, the interaction effect between IV and SD exists both on EV and WI, while the interaction effect exists only on EV in the moderated mediation model on the right.*

In order to test the two possible scenarios involving both mediator (EV) and moderator (SD), one should build at least three different linear equation models (Baron & Kenny, 1986; Muller, Judd, & Yzerbyt, 2005) as follows.

\[
\begin{align*}
\text{WI} & = \beta_{10} + \beta_{11} \text{IV} + \beta_{12} \text{SD} + \beta_{13} \text{IVxSD} + \varepsilon_1 \\
\text{EV} & = \beta_{20} + \beta_{21} \text{IV} + \beta_{22} \text{SD} + \beta_{23} \text{IVxSD} + \varepsilon_2 \\
\text{WI} & = \beta_{30} + \beta_{31} \text{IV} + \beta_{32} \text{SD} + \beta_{33} \text{IVxSD} + \beta_{34} \text{EV} + \beta_{35} \text{EV} \times \text{SD} + \varepsilon_3
\end{align*}
\]

Model (1) is about the overall effects of IV and SD on WI without the mediator EV, and Model (2) shows the effects of IV and SD on the mediator EV. Finally, Model (3) shows the effects of IV and SD on WI with EV and EV $\times$ SD held constant. To test whether the direct effects of IV on WI is mediated by EV, first, it should be confirmed whether the effects get substantially weaker or completely disappear with the presence of a mediator in the model. The former case is for a partial mediator, while the latter is for a perfect mediator.

If the mediating process is statistically supported, then the two scenarios can be tested. For the first case (mediated moderation) to happen, $\beta_{13}$ must depart from zero ($\beta_{13} \neq 0$), which means SD should significantly moderate the effects of IV on the dependent variable, WI. Then, it should be confirmed that both $\beta_{23}$ and $\beta_{34}$ depart from zero ($\beta_{23} \neq 0$ and $\beta_{34} \neq 0$), and/or both $\beta_{21}$ and $\beta_{35}$ depart from zero.
(\(\beta_{21} \neq 0\) and \(\beta_{35} \neq 0\)). Nonzero values of \(\beta_{23}\) and \(\beta_{34}\) mean that the effects of IV on EV depend on SD, and EV has a significant main effect on WT. If both \(\beta_{21}\) and \(\beta_{35}\) have nonzero values, on the other hand, this means the effect of IV on WI is mediated by EV, and the influence of EV on WI is moderated by SD.

Second, SD may not have any overall moderating effect on WI, but affect the mediation process. For this case to happen, \(\beta_{13}\) must be zero (\(\beta_{13} = 0\)), which means there should be no overall moderation of SD on the effects of IV on WI. Then, \(\beta_{23}\) and/or \(\beta_{35}\) should depart from zero (\(\beta_{23} \neq 0\) and/or \(\beta_{35} \neq 0\)). If \(\beta_{23}\) is nonzero, SD moderates the effect of IV on EV, while if \(\beta_{35}\) is nonzero, the effect of EV on WI depends on SD. Moderated mediation is different from mediated moderation in that no overall moderation of the independent variable’s effects is assumed. Only the mediating process is moderated (Lawrence & Brett, 1984; Muller, Judd, & Yzerbyt, 2005). Therefore, the two competing hypotheses can be summarized as follows:

H1a: The effects of information valence on eWOM intention significantly vary as a function of social network density, and this moderation occurs through the mediation of information value perception (Mediated Moderation Hypothesis).

H1b: The social network density has no direct moderating effects on eWOM intention, but influences individuals’ perceived information value (Moderated Mediation Hypothesis).

Methods

Experimental Procedures
The hypotheses proposed were tested in an online experiment, in which four different experimental conditions were manipulated following a 2 (Social network density: high vs. low) x 2 (Information valence: positive vs. negative) between-subject factorial design. Undergraduate students at a large U.S. state university were e-mailed recruiting messages directing them to the online experiment site; participants were offered extra credit as an incentive. The cover page of the online experiment site randomly displayed the links to four different versions of the questionnaire, one at a time. Through the page, participants were assigned to the different experimental conditions mentioned above.

It has been reported in many studies that if an ego is strongly tied to multiple alters, those alters are likely to know one another (high network density), while this is not the case if the ego is weakly tied to them (low network density). This means that a researcher can manipulate an egocentric network’s density by identifying the ego-alter tie strength. Following this approach, first, half of the participants were asked to report five “closest friends or colleagues,” while the remaining half was asked to report five “casual acquaintances.” Participants in both conditions were asked a series of questions regarding their direct relationship strength with and the relationships among the five individuals reported. After filling out this part of the questionnaire, both groups were given a scenario describing a situation where
they and the network members they reported together are “members of an online discussion group” that is aimed at exchanging useful information related to a digital camera product.

Next, participants were exposed to the information about a product—a hypothetical digital camera, a new product to be released into the market soon. For manipulating the valence of information, the description of the product was framed either positively or negatively (Tversky & Kahneman, 1986). First, following Grewal, Gotlieb, and Marmorstein’s (1994) manipulation, the product was described as “superior” to other competitors’ products in the positive condition, while other competitors’ products were described as “inferior” to the focal product in the negative condition. Second, a sentence stating that 80% of consumers were “satisfied” was inserted into the statements for the camera in the positive condition, while the negative condition had a statement that said 20% of consumers were “dissatisfied” (Zhang & Buda, 1999).

This framing method was used to create two virtually identical versions of product information except subtle differences in valence for two reasons. First, if a product is described either too positively or negatively, subjects might infer the quality of the product from it, which would confound the effects of information valence with the product quality perception. Second, if individuals respond sensitively to such a small difference in valence, it would be evident that they pay attention to the traits of information. After being exposed to this product information, participants were asked to answer a series of questions including their eWOM intention, evaluation of the product, perceived information value for others, and personal involvement levels with the product category.

Measurements
As the primary dependent variable, participants’ eWOM intention was measured by three 10-point bipolar scale items anchored by unlikely/likely, improbable/probable, impossible/possible (Cronbach $\alpha = .84$), which were often used for a composite measure of behavioral intention. To measure perceived information value for others as a mediator, participants were asked to rate how they would evaluate the given information’s value for the potential recipients in their networks on three 10-point bipolar scales anchored on informative/uninformative, interesting/uninteresting, and useful/not useful ($\alpha = .68$). These three items were selected from Olney, Holbrook, and Batra’s (1991) scales for measuring the utilitarian consumer attitude. Since product involvement may be correlated with consumers’ WOM intention (Richins & Root-Shaffer, 1988), participants’ personal product involvement level was also measured by using Zaichkowsky’s (1985) Personal Involvement Inventory (PII) items, to be used as a covariate ($\alpha = .91$).

For the purpose of manipulation check, two different variables were measured. First, to check the manipulation of high vs. low-density networks, participants were asked to report how close they were with each alter as well as how close the five alters were with one another on a 5-point rating scale (e.g. $1 = $ not close, $5 = $ very close, $0$
= no social tie). One thing to note here is that the direct connections between the ego and the five alters were excluded from calculating an egocentric network density in order to see the impact of network structure independent of the intimacy between ego and alters. In other words, a network density is only about the average strength of social connections among the $N-1$ alters reported by an ego. In total, 15 pairs of relationships were measured in each network, and social network density ($D$) was calculated as follows:

$$D = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} \chi_{ij}}{\text{max} \sum_{i=1}^{n} \sum_{j=1}^{n} \chi_{ij}}$$

where $\chi_{ij} =$ the tie strength between person $i$ and $j (i \neq j)$

$\chi_{ij}^{*} =$ the maximum possible tie strength between $i$ and $j$

A group’s network density is a ratio of the sum of the strength of existing social ties in a network and the sum of the maximum possible strength of all possible social ties, which ranges from 0 to 1. If density is zero, no ties or connections exist in a network, while if density is 1, every person in a network is connected with maximum strength to $N-1$ others. Most existing networks fall between the two extreme values. Secondly, for the manipulation check of information valence, participants’ evaluation of the product described was measured with three 10-point bipolar scale items anchored by positive/negative, bad/good, and favorable/unfavorable ($\alpha = .93$), which are often used for a composite measure of attitude (Zhang & Buda, 1999).

**Manipulation Checks**

The total number of cases collected was 121 (male = 43; female = 78). No systematic differences between the gender categories were found in terms of eWOM intention, $F(1, 119) = .00, p = .96$, and perceived information value, $F(1, 119) = 2.80, p = .10$. Thus, the gender factor was not considered further. To check the information valence manipulation, first, participants’ evaluation of the product described was compared across conditions with their product involvement held constant. The results showed that participants exposed to positively framed information evaluated the product more positively, $M_{\text{positive}} = 7.03$, than those exposed to negatively framed information, $M_{\text{negative}} = 5.73; F(1, 118) = 16.14, p < .01, \eta^2 = .12$. Therefore, the manipulation of information valence was successful. Second, to assess the degree of social coherence across the two manipulated groups, the mean network density scores were compared. As expected, the mean density score of the dense network group, $M_{\text{strong}} = .49$, was significantly higher than that of the other group, $M_{\text{weak}} = .32; F(1, 119) = 29.33, p < .01, \eta^2 = .20$.

**Results**

This study focuses on the effects of network density on eWOM intention. Although an ego’s direct ties with the alters were excluded from calculating the network density,
it is still possible that the effect of network density is confounded by the ego-alters closeness: Participants might have a higher eWOM intention simply because they are personally close to the recipients. To parse out this possibility, first, a bivariate correlation between participants’ eWOM intention and their tie strength with N-1 alters was examined, but the average ego-alter tie strength was not correlated with the ego’s likelihood of eWOM, \( r(121) = .11, p = .22 \). Further, the ego-alter tie strength was included in a linear regression model to see its possible effect on eWOM intention with the presence of other factors including the information valence and network density, but no significant effect of the tie strength was found, \( \beta = -.09, t(117) = .80, p = .43 \). This result supports the inference that individuals’ eWOM intention in an N-person interaction depends on whether N-1 recipients are perceived as a concrete entity rather than the sender’s direct relationship strength with them.

In order to test the hypotheses proposed, three ANCOVA models with participants’ product involvement as a covariate were constructed. Table 1 shows the univariate test results of the three models. In Model I, product involvement as a covariate had no significant effect, \( F(1, 116) = .01, p = .93 \), but both information valence and social network density had a significant main effect on participants’ eWOM intention. For the information valence factor, participants exposed to the positively framed information had a higher eWOM intention, \( M_{\text{positive}} = 6.17, n = 74 \), than those exposed to the negative one, \( M_{\text{negative}} = 5.30, n = 47 \), \( F(1, 116) = 4.11, p < .05, \eta^2 = .03 \). With regard to social network density, participants’ eWOM intention was higher when the network density was high, \( M_{\text{high}} = 6.34, n = 69 \), than low, \( M_{\text{low}} = 5.13, n = 52 \), \( F(1, 116) = 8.03, p < .01, \eta^2 = .06 \). No two-way interaction effects between information valence and network density (IV \( \times \) SD) were found, \( F(1, 116) = 1.83, p = .18 \), which means SD had no moderating effects directly on WI.

Model II had participants’ perceived information value for others (EV) as the dependent variable. The effects of participants’ product involvement on their information value perception were marginally significant, \( F(1, 116) = 2.95, p = .09, \eta^2 = .02 \). When the product involvement was held constant, the interaction effects of information valence and social network density (IV \( \times \) SD) were found statistically significant, \( F(1, 116) = 5.95, p < .05, \eta^2 = .05 \). This means that the effects of information valence on participants’ perceived information value varied as a function of network density. In the dense network condition, participants’ perceived information value was not differentiated by the valence of information, \( M_{\text{positive}} = 6.11, n = 42; M_{\text{negative}} = 6.38, n = 27 \). In the low density condition, however, participants perceived the value of information for others lower when the information was negative, \( M_{\text{negative}} = 5.36, n = 20 \), than positive, \( M_{\text{positive}} = 6.43, n = 32 \). This result shows that people’s information value perception is differentiated by the subtle difference in information valence only when the potential recipients are not socially close to one another.

Model III included the mediator—participants’ perceived information value for others (EV)—as an independent factor, and its main effects on eWOM intention were
Table 1 Three ANCOVA models

<table>
<thead>
<tr>
<th></th>
<th>Model I DV: eWOM Intention</th>
<th>Model II DV: Perceived Info. Value</th>
<th>Model III DV: eWOM intention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sum of Squares</strong></td>
<td><strong>Df</strong></td>
<td><strong>F</strong></td>
<td><strong>Sum of Squares</strong></td>
</tr>
<tr>
<td>Information Valence (IV)</td>
<td>21.22</td>
<td>1</td>
<td>4.11*</td>
</tr>
<tr>
<td>Perceived Info. Value (EV)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Social Network Density (SD)</td>
<td>41.47</td>
<td>1</td>
<td>8.03**</td>
</tr>
<tr>
<td>Product Involvement</td>
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<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>IV × SD</td>
<td>9.44</td>
<td>1</td>
<td>1.83</td>
</tr>
<tr>
<td>SD × EV</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Error</strong></td>
<td>599.30</td>
<td>116</td>
<td>241.83</td>
</tr>
</tbody>
</table>

Note: Model I, II, and III have different sets of independent and dependent variables. In the table cell, “—” means the variable is not included in the model.

*p ≤ 1.0, *p ≤ .05, **p ≤ .01.
Table 2 Model I: Means and Standard Errors

<table>
<thead>
<tr>
<th>Information Valence</th>
<th>Positive</th>
<th>Negative</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Network Density</td>
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</tr>
<tr>
<td>High</td>
<td>6.49</td>
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<td>6.34</td>
</tr>
<tr>
<td>(.35) (.44) (.28)</td>
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<tr>
<td>Low</td>
<td>5.85</td>
<td>4.40</td>
<td>5.13</td>
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<tr>
<td>(.40) (.51) (.32)</td>
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<tr>
<td>Total</td>
<td>6.17</td>
<td>5.30</td>
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<tr>
<td>(.27) (.34)</td>
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Note: Dependent variable is eWOM intention. Standard errors are in parenthesis.

Table 3 Model II: Means and Standard Errors

<table>
<thead>
<tr>
<th>Information Valence</th>
<th>Positive</th>
<th>Negative</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Network Density</td>
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</tr>
<tr>
<td>High</td>
<td>6.11</td>
<td>6.38</td>
<td>6.25</td>
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<tr>
<td>(.22) (.28) (.18)</td>
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<tr>
<td>Low</td>
<td>6.43</td>
<td>5.36</td>
<td>5.90</td>
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<tr>
<td>(.26) (.32) (.21)</td>
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</tr>
<tr>
<td>Total</td>
<td>6.27</td>
<td>5.87</td>
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<tr>
<td>(.17) (.21)</td>
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</table>

Note: Dependent variable is perceived information value for others. Standard errors are in parenthesis.

statistically significant, $F(1, 114) = 8.92, p < .01, \eta^2 = .07$. In addition, compared with Model I, the main effects of information valence on eWOM intention in this model became nonsignificant with the presence of the mediator, $F(1, 114) = 2.78, p = .10$. The results imply that participants’ value perception mediated the effects of information valence on their eWOM intention. Similar to Model I, no overall interaction effects between information valence and network density (IV x SD) were found, $F(1, 114) = .52, p = .47$. Further, the interaction between perceived information value for others and social network density (EV x SD) was not statistically confirmed, $F(1, 114) = .05, p = .82$. In sum, the results support H1b (moderated mediation hypothesis) instead of Hypothesis 1a (mediated moderation hypothesis).

Discussion

The experimental results show that social network structures influence individuals’ eWOM motivation indirectly by way of affecting the ways they gauge the value of information for the potential recipients. In Model I, both independent factors were found to have significant main effects on eWOM intention, while no interaction between the two was found. Participants in this study had a higher eWOM intention in a dense social network than in a nondense one, which replicates the previous...
Table 4 Model III: Means and Standard Errors

<table>
<thead>
<tr>
<th>Information Valence</th>
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<th>Negative</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td>High</td>
<td>6.49</td>
<td>6.09</td>
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<td></td>
<td>(0.34)</td>
<td>(0.43)</td>
<td>(0.27)</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>5.74</td>
<td>4.70</td>
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<td>(0.40)</td>
<td>(0.52)</td>
<td>(0.32)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6.12</td>
<td>5.39</td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
<td>(0.34)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Dependent variable is eWOM intention. This model includes perceived information value for others (EV) as an independent factor. Standard errors are in parenthesis.

findings that strong ties are more easily activated for WOM than weak social ties (Brown & Reingen, 1987). Looking at Model I only, one might conclude that both information valence and social network density affect eWOM intention separately without any interaction between the two.

Subsequent analyses in Model II and III, however, revealed that the main effects of both independent factors disappeared with the presence of subjects’ perceived information value (EV) in the model, while the interaction effects between information valence and social network density on the mediator emerged. Considering the two models together shows that participants’ perceived information value mediated the effects of the information valence on their eWOM intention, and more importantly, they perceived the information value for the recipients differentially by discriminating the structures of a personal network. In other words, the degree of social coherence of a personal network did not directly moderate the effects of information valence on eWOM intention, but affected the way individuals gauged the value of information for the recipients. Hence, the results supported H1b (moderated-mediation hypothesis) instead of H1a (mediated-moderation hypothesis). More specifically, participants in a dense social network did not discriminate information with different valences, which means that positive and negative information might be almost equally communicated. In contrast, participants in a nondense network perceived positive information as more valuable than negative information for the recipients, which resulted in different levels of eWOM intention. This implies that when people communicate with acquaintances or strangers, they are more likely to give them positive product information than negative one.

Implications and Limitations

As widely recognized, consumer WOM is a dual-edged sword for companies: While positive WOM about products and companies can be the most powerful form of advertising, negative WOM can be a nightmare. Thus, the question of whether
consumers talk more about positive or negative aspects of products/services logically follows. Decades ago, Engel, Kegerreis, and Blackwell (1969) attempted to answer this question and found that consumers tend to talk about positive aspects of products/services more frequently than negative ones. Based on the findings, they conclude “the hypothesis that negative experiences are diffused to a greater extent than positive experiences must be rejected” (p. 18). Meanwhile, many psychological studies have found that people tend to pay more attention to the negative than the positive side of an object/person, because they regard negative information as salient and diagnostic (e.g., Feldman & Lynch, 1988; Mizerski, 1982; Smith & Petty, 1996).

Then, a perplexing question remains: Why do people talk more about positive than negative things, even though they find negative information more useful and diagnostic? This counterintuitive result means that there are more factors affecting individuals’ WOM motivation than just information valence. In their survey, Engel and his colleagues measured how consumers used WOM to express their satisfaction or dissatisfaction regarding products/services, but did not consider that the transmission of positive or negative information might depend on to whom they talked. In other words, the moderating role of social factors was not explicitly examined, which prevented them from explaining why positive information was transmitted to a greater degree than negative information. On the other hand, diffusion theorists have taken for granted the influence of social relationships and networks on individual’s communicative motivation, but rarely attempted to explicate how the social structure interacts with individual motivation. As a result, the problems on the intersection between psychological and social dimensions of WOM have received little scholarly attention.

This study is an exploratory attempt to bridge the gap between the two existing approaches by examining the effects of social relationships on a psychological level. As the study shows, the effects of information valence on individuals’ perceived information value may vary depending on the group’s network density, which would yield different eWOM intention. This implies that people adaptively respond to the social circumstance, which suggests that the effects of social structural environment can be filtered by an actor’s judgment of whether a social circumstance is appropriate for the given action. In other words, one’s eWOM behavior is neither a structurally determined outcome nor a purely psychological outcome separated from a social environment. As Frenzen and Nakamoto (1993) aptly put it, information flows not through “fixed” bridges, but through “drawbridges that are raised and lowered by transmitters in response to the perceived [benefits or] hazards of the information they consider for transmission” (p. 373).

Limitations of this study should be mentioned. First, this study tested the hypotheses in scenario-based experiments, which might lower the external validity of the findings. Unobtrusive observations or field experiments may prove better alternatives for testing further whether the findings of this study hold in a natural setting. Secondly, this study considered only the valence of information, but information could have many different characteristics, which may differentially...
influence a person’s perception and behavior. In the future, research efforts should identify various other elements of information. Third, this study examined only the information with moderate valence by using the message framing method, and found that individuals might transfer more positive than negative information when they belong to a nondense network. This pattern, however, might not hold when information with extreme valence is involved. Since the Internet greatly facilitates communication among people who are weakly tied to each other, it would be interesting to see in future research how individuals’ eWOM intention varies depending on a wider range of information valence.

Finally, this study employed the concept of “social network density,” which was measured by self-reported personal social network properties. This “egocentric” network measurement has critical drawbacks, however, despite its convenience for implementation. That is, self-reported network data may produce subjectively biased pictures of networks (Marsden, 1990). There are many concepts mirroring various properties of personal social networks besides network density, and future extensions of this study should take into account other structural properties of social networks (e.g., positions of individuals in a network, network centrality) to reveal more realistic pictures of the social exchange of information.

References


**About the Author**

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