

SYNERGY EFFECT BETWEEN WORD-OF-MOUTH GENERATION AND CONSUMPTION: EMPIRICAL STUDY ON LAPTOP AND BISCUIT PRODUCT CATEGORIES

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Abstract: Word-of-mouth (WOM), as one of the most effective communication methods to influence consumer decisions through product transmission, has drawn wide spread attention from many academic researchers and marketers in recent years. Arndt (1967) defined WOM as “Oral, person-to-person communication between a perceived non-commercial communicator and a receiver concerning a brand, a product, or a service offered for sale.” In contrast to research on the effects of WOM, comparatively less is known about WOM consumption or usage. The present study intends to investigate whether a consumer can generate WOM among others and whether consumers can use WOM to make purchase decisions. This research utilizes two unique sets of data collected from two different product categories, namely laptops and biscuits. The discrete choice model applied to assess consumer WOM generation and consumption decisions is based on Yang’s model (2012). This research focuses on the synergy effects between two WOM-related activities and the key drivers behind WOM generation and consumption. This study mainly adopts Yang’s model to analyze laptop and biscuit data. Results reveal a strong synergy effect between WOM generation and consumption. Moreover, findings show that the synergy effect on laptops is higher than on biscuits in terms of WOM generation and consumption. Additionally, consumer product experience and media exposure appear to influence customer propensity to generate and consume WOM. Above all, these findings offer important managerial implications regarding targeting for the effective use of WOM as a marketing tool.

Keywords: Word-of-Mouth, Product Category, DiscreteChoiceModel, Synergy Effects.

1. INTRODUCTION

How many of your friends have watched a movie because of your recommendation? How many people buy a new product because it was recommended by a friend? This persuasive and influential process is known as word-of-mouth (WOM). WOM has attracted increasing scholarly attention in recent years as one of the most effective modes of communication to influence consumer decisions through product information transmission, related purchases, and product consumption. WOM suggestions from friends and family members are considered earned advertising, which is highly influential. Statistics from a Nielsen online survey indicate that 84%

of global respondents from 58 countries believed this type of source to be credible.¹ Research on the importance of WOM has identified it as a primary factor in consumer purchase decisions (Leonard-Barton, 1985; Price and Feick, 1984; Richins, 1993; Gieses et al., 1996), asserting it has a substantial impact on product evaluation and purchases (Brown and Reingen, 1987; Price and Feick, 1984).

To promote the effectiveness of WOM, WOM generation (i.e., passing information to others) and WOM consumption (i.e., consuming WOM when making purchase decisions) must operate concurrently (Yang *et al.*, 2012). Many academic researchers have focused on

WOM at an aggregate level. Compared with studies on the effects of WOM, less attention has been paid to WOM consumption or usage (Yang *et al.*, 2012). However, WOM consumption plays a noteworthy role in promoting the flow of information and affecting product diffusion and sales (Berger and Schwartz, 2011; Yang *et al.*, 2012). The combination factor in relation to WOM generation and consumption determines the ultimate success of WOM. Therefore, it is necessary to study the fundamental drivers behind WOM generation and consumption.

It is similarly worthwhile to examine the positive synergy effect between WOM generation and consumption. Yang *et al.* (2012) initially tried to examine this interdependent relationship; compared to when the synergy effect is negative, a single individual is more likely to generate and consume WOM when the effect is positive. It is therefore desirable for companies to target those with high intensity of and positive synergy between WOM generation and consumption when managing WOM. Furthermore, it is critical to understand the difference between WOM generation and consumption and their synergy effect on different product categories. Previous research has examined this issue in the context of automobiles, but it would be useful to understand how product characteristics explain the difference in the synergy effect between WOM generation and consumption. To analyze and demonstrate the potential impacts of product characteristics on the synergy effect, this research is conducted on two sets of data.

Use of the discrete choice model to study consumer WOM generation and consumption decisions is based on Yang's model, which posits that consumer decisions can be modeled jointly on WOM generation and consumption. Meanwhile, the potential synergy effect between the two activities can also be demonstrated. Hence, as a preference, it is more likely for a firm to target consumers with high intensity and positive synergy along with WOM generation and consumption when managing WOM.

In this paper, we utilize two survey-based datasets in the laptop and biscuit categories to empirically examine the following issues: (1) does a synergy effect exist between WOM generation and consumption? If so, what is the different synergy effect pattern in the two different

product categories? (2) How do consumer product experiences and media usage habits influence WOM generation and consumption after controlling for interdependence between these two WOM activities? This paper contains seven sections. Section 2 presents a literature review and conceptual framework. The econometric model is outlined in Section 3 to capture the interdependence/synergy between WOM generation and consumption. Section 4 provides information on the datasets. The proposed model is applied to the laptop and biscuit categories with findings discussed in Section 5. Then, managerial implications are addressed in Section 6. Lastly, the conclusion, research limitations, and directions for future study are illustrated in Section 7.

2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1. Word-of-Mouth (WOM)

WOM is commonly regarded as a major factor in business and has been an enduring research object in academia (Jacob, 2000). Arndt (1967) defined WOM as "Oral, person-to-person communication between a perceived non-commercial communicator and a receiver concerning a brand, a product, or a service offered for sale." WOM studies generally take one of two approaches. The first focuses on WOM consumption or usage, where researchers try to understand how consumer behavior is changed by WOM. Hu (2012) defined WOM consumption as "People actually [using] WOM in their decisions, which means, the more the WOM generation, the bigger the impact which would have on sales" (p. 6). The other perspective stresses WOM generation. In the first line of research, authors have agreed that WOM acts as an independent variable through in-depth exploration of its consequences. For example, WOM has an obvious effect on sales (Leskovec, Adamic, and Huberman 2007), product adoption (Trusov, Bucklin, and Pauwels 2009), and customer patronage in restaurants (Godes and Mayzlin 2009). Many previous studies have examined the relationship between consumer product reviews and product sales. Findings have revealed that WOM and product sales volume are positively correlated. For instance, Chen *et al.* (2007) pointed out that reviews, as a helpful factor, seem to exert a greater influence on

retailer sales. Duan *et al.* (2009) suggested that WOM has a more significant impact on less-popular products than on popular products. However, several studies failed to identify a statistically significant relationship (Duan *et al.*, 2005; Liu 2006). Generally, using reviews as a proxy of WOM should require that these product reviews are actually used by consumers (Hu, 2012). Unlike most of the aforementioned studies, we directly measure consumer WOM generation and consumption in this study through survey data, borrowing the method applied to WOM research by Yang *et al.* in 2012.

The second stream of literature treats WOM as an outcome for which drivers behind WOM communication should be identified. One line of study focuses on the effect of social structure on WOM. Results reveal that WOM generation may differ, as the consequences depend on who is talking to whom (Yang *et al.* 2012). The relationship between WOM and tie strength has been analyzed by Wirtz and Chew (2002), who found a positive correlation between tie strength and WOM transmission. Other studies have examined the factors affecting WOM generation. Richins (1983) identified various factors that trigger negative WOM, such as failure to handle complaints appropriately or inefficient product repair services. Swan and Oliver (1989) demonstrated it is more likely for satisfied purchasers of a new car to transmit positive WOM to others. File *et al.* (1992) pointed out that gratification with service delivery leads to more positive WOM. Berger and Schwartz (2011) examined psychological drivers of direct and continuous WOM. More interesting products often manage to garner more direct WOM but do not receive more ongoing WOM over several months or as a whole (Berger and Schwartz, 2011). Yang *et al.* (2012) modeled simultaneous consumer decisions related to WOM generation and consumption while capturing the synergy effect between two WOM-related activities. In this research, we adopt Yang's approach.

2.2. Synergy Effect Between WOM Generation And Consumption

Previous research suggests that opinion leadership should be associated with opinion seeking (Katz and Lazarsfeld 1955, Wright and Cantor 1967), which may indicate a

synergy effect between WOM generation and consumption. Originally, Yang *et al.* (2012) examined the interdependent/synergistic relationship between these factors. They identified strong synergy between WOM generation and consumption, the effect of which could be either positive or negative. In the case of a positive synergy effect, the utility from engaging in WOM generation and consumption is higher than the sum of utilities from either generating or consuming WOM alone². In this scenario, consumers consider WOM generation and consumption complementary; therefore, WOM generation increases WOM consumption. On the other hand, the synergy effect between these two related WOM activities could be negative. In this case, utility from engaging in both activities is lower than that from either generation or consumption alone. In other words, consumers view the two WOM activities as partial substitutes. Hence, WOM generation will reduce WOM consumption and vice versa.

Consistent with previous research by Yang *et al.* (2012), we assume a synergy effect between WOM generation and consumption, holding consumer product experience, media exposure, and unobservable factors as constant. In terms of positive synergy, WOM generation and consumption are expected to reinforce each other, whereas WOM generation and consumption will undermine each other.

2.3. Product Experience

Strong evidence suggests that consumers are fond of sharing product and service experiences with others through WOM (Gaby A *et al.*, 2010). According to Keller (2007), Americans generate 120 WOM conversations per week on average. Drawing from research by Yang *et al.* (2012), product experience can play a crucial role in illuminating consumer reactions to WOM. Yang *et al.* (2012) demonstrated that more experiences with a product indicates two factors: first, the person possesses more knowledge about the product category (Yang *et al.*, 2012; Triantafyllidou and Siomkos, 2014); and second, the consumer is more interested in the product category (Hu, 2012). On the WOM generation side, consumers with more product experience are perceived as having product category knowledge and interest, hence

leading to a higher possibility of engaging in WOM in this product category. Sundaram *et al.* (1998) indicated that motives for generating WOM are significantly related to consumption experiences. In regard to WOM consumption, previous studies on information seeking have found disparate results. On one hand, some authors identified a negative relationship between product experience and information searches (e.g., Anderson *et al.*, 1979), such that more knowledge may reduce a consumer's need for WOM and thus reduce WOM consumption. On the other hand, more knowledge and higher relevance or product interest could lead to greater WOM consumption. A few studies on consumer behavior have indicated that prior knowledge encourages information searches by allowing an individual to formulate more questions and help them evaluate responses to those questions, thus reducing the cognitive cost of using information and increasing the benefit of obtaining information (Jacoby *et al.*, 1978).

2.4. Media Exposure

Media exposure has been defined by Schultz and Lauterborul (1993) as “any opportunity for a reader, viewer, or listener to see or hear an advertising message in a certain media vehicle.” According to recent research from Nielsen, the most influential driver of new product consciousness is in-store discovery (72%), followed by TV (59%) and print (54%) advertising, respectively.³ Product demonstrations are widely used in television commercials, where as a brand image can be established and in-depth information can be communicated through print advertisements. Furthermore, product packaging tends to be fully used to attract consumer's interests by the time of product sales procedure. The above findings are also mentioned in *Advertising and promotion: An integrated marketing communications perspective* (Belch & Belch, 1995).

Qader *et al.* (2011) demonstrated that media exposure has a significant positive influence on consumers' purchase intentions. Moreover, Stefano *et al.* (2014) indicated that social media exposure intensifies WOM. Hence, customers can amass extensive product information through mass media in a high media exposure context. For instance, if a customer watches TV or regularly uses other mass media such as newspapers,

magazines, and the internet, the customer can make himself well acquainted with a given product category. In this case, a consumer's need for WOM consumption declines while WOM generation increases (Yang *et al.*, 2012). Therefore, our hypothesis is in line that of with Yang *et al.* (2012): media exposure level is negatively related with the consumer possibility of WOM consumption and positively associated with the consumer probability of WOM generation in a given category.

2.5. Conceptual Framework

In our research, we model consumers' simultaneous decisions around WOM generation and consumption while capturing the synergy effect between these two activities. The conceptual framework of this research is presented in Figure 1 as a summary of our critical content.

3. MODEL DESCRIPTION

In this research, the discrete choice model used to study consumer WOM generation and consumption decisions is based on that of Yang. The present research defines the model as a logit model. In line with previous work, we assume that an individual maximizes the joint utility of WOM generation and consumption in the sense that

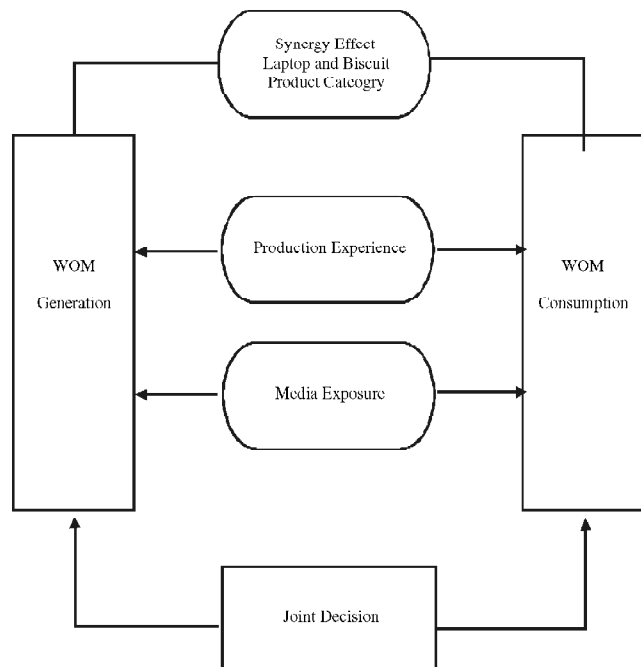


Figure 1: Conceptual Framework

WOM generation and consumption are two important activities related to an individual's social tendency regarding information. This connection may suggest a process by which consumers make joint decisions on whether to generate and use WOM. Therefore, customers will presumably choose the highest utility of four possible decision outcomes.

We also assume that the synergy effect appears in joint utility when a consumer engages in and consumes WOM simultaneously. We observe information regarding whether consumer *i* passes WOM to others and whether consumer *i* uses WOM in making a purchase decision for the same product category. There are four possible outcomes: (1) the consumer generates and uses WOM, denoted as $(Y_i^G = 1, Y_i^C = 1)$; (2) the consumer generates but does not use WOM $(Y_i^G = 1, Y_i^C = 0)$; (3) the consumer does not generate but uses WOM $(Y_i^G = 0, Y_i^C = 1)$; and (4) the consumer neither generates nor uses WOM $(Y_i^G = 0, Y_i^C = 0)$.

We calculate the joint utility of WOM generation and consumption as follows:

$$U(Y_i^G, Y_i^C) = (X_i \beta^G)Y_i^G + (X_i \beta^C)Y_i^C + \theta Y_i^G Y_i^C + \varepsilon(Y_i^G Y_i^C) \quad (1)$$

where

U is the joint utility of WOM generation and consumption,

$X_i \beta^G$ is the intrinsic utility of WOM generation,

$X_i \beta^C$ is the intrinsic utility of WOM consumption, and

θ is the extrinsic utility of WOM generation and consumption.

The joint utilities associated with the four outcomes for person *i* are

$$U(Y_i^G = 1, Y_i^C = 1) = X_i \beta^G + X_i \beta^C + \theta + \varepsilon_{i1} \quad (2)$$

$$U(Y_i^G = 1, Y_i^C = 0) = X_i \beta^G + \varepsilon_{i2} \quad (3)$$

$$U(Y_i^G = 0, Y_i^C = 1) = X_i \beta^C + \varepsilon_{i3} \quad (4)$$

$$U(Y_i^G = 0, Y_i^C = 0) = \varepsilon_{i4} \quad (5)$$

where X_i includes an intercept, a vector of variables measuring consumer *i*'s product category experience, and

a vector of variables measuring consumer *i*'s media exposure. θ represents the synergy effect between WOM generation and WOM consumption, and the error term ε captures the random of the four decision outcomes, respectively.

Next, we set the model to capture the synergy effect θ and rewrote Equations (2)-(5) as follows:

$$U(Y_i^G = 1, Y_i^C = 1) = \beta_0^G + \beta_0^C + X_i \beta^G + X_i \beta^C + \theta + \varepsilon_{i1} \quad (6)$$

$$U(Y_i^G = 1, Y_i^C = 0) = \beta_0^G + X_i \beta^G + \varepsilon_{i2} \quad (7)$$

$$U(Y_i^G = 0, Y_i^C = 1) = \beta_0^C + X_i \beta^C + \varepsilon_{i3} \quad (8)$$

$$U(Y_i^G = 0, Y_i^C = 0) = \varepsilon_{i4} \quad (9)$$

where X_i includes a vector of variables measuring consumer *i*'s product category experience and a vector of variables measuring consumer *i*'s media exposure. In light of four possible decision outcomes, we identified three intercepts in the discrete choice model. Using neither WOM generation nor consumption as the baseline, we presume the utility is 0. Observations of $(Y_i^G = 1, Y_i^C = 0)$ allowed us to identify the intercept of the WOM generation utility in Equation (7), β_0^G . Similarly, observations of $(Y_i^G = 0, Y_i^C = 1)$ allowed us to identify the intercept of WOM generation utility in Eq. (8), β_0^C . Then, observations of $(Y_i^G = 1, Y_i^C = 1)$ allowed us to identify the intercept of WOM generation utility in Eq. (7), β_0^G . Finally, observations of $(Y_i^G = 0, Y_i^C = 1)$ allowed us to identify the intercept in the joint utility of WOM generation and consumption in Eq. (6), which is the sum of β_0^G, β_0^C and θ . Given that β_0^G and β_0^C are uniquely identified through Eqs. (7) and (8), the synergy measure θ can be uniquely identified through Eq. (6).

Defining $P_i(Y_i^G, Y_i^C)$ as the probability of observing consumer *i*'s decision on WOM generation and consumption, we can obtain $P_i(Y_i^G, Y_i^C)$ through Eqs. (10)-(13).

$$P_i(\mathbf{1}, \mathbf{1}) = \frac{e^{\beta_0^G + \beta_0^C + X_i \beta^G + X_i \beta^C + \theta}}{e^{\beta_0^G + \beta_0^C + X_i \beta^G + X_i \beta^C + \theta} + e^{\beta_0^G + X_i \beta^G} + e^{\beta_0^C + X_i \beta^C} + 1} \quad (10)$$

$$P_i(\mathbf{1}, \mathbf{0}) = \frac{e^{\beta_0^G + X_i \beta^G}}{e^{\beta_0^G + \beta_0^C + X_i \beta^G + X_i \beta^C + \theta} + e^{\beta_0^G + X_i \beta^G} + e^{\beta_0^C + X_i \beta^C} + 1} \quad (11)$$

$$P_i(\mathbf{0}, \mathbf{1}) = \frac{e^{\beta_0^C + x_i \beta^C}}{e^{\beta_0^G + \beta_0^C + x_i \beta^G + x_i \beta^C} + e^{\beta_0^G + x_i \beta^G} + e^{\beta_0^C + x_i \beta^C} + 1} \quad (12)$$

$$P_i(\mathbf{0}, \mathbf{0}) = \frac{1}{e^{\beta_0^G + \beta_0^C + x_i \beta^G + x_i \beta^C} + e^{\beta_0^G + x_i \beta^G} + e^{\beta_0^C + x_i \beta^C} + 1} \quad (13)$$

We calculate the probability of observing individual i 's observed decision as

$$f_i = P_i(\mathbf{1}, \mathbf{1})^{y_i^G y_i^C} P_i(\mathbf{1}, \mathbf{0})^{y_i^G (1 - y_i^C)} P_i(\mathbf{0}, \mathbf{1})^{(1 - y_i^G) y_i^C} P_i(\mathbf{0}, \mathbf{0})^{(1 - y_i^G)(1 - y_i^C)} \quad (14)$$

The log-likelihood function can be represented as

$$L(\beta^G, \beta^C, \beta_0^G, \beta_0^C, \theta) = \sum_i \ln(f_i) \quad (15)$$

In this research, we apply the quasi-Newton method to maximize the log-likelihood function. We use the BFGS algorithm to approximate the Hessian matrix.

4. DATA DESCRIPTION

We obtained cross-sectional survey data from a national survey company that collects information in Korea on consumer purchasing behavior and attitudes. Data were collected from April 2014 to April 2015. Approximately 700 respondents participated in the consumer behavior survey.

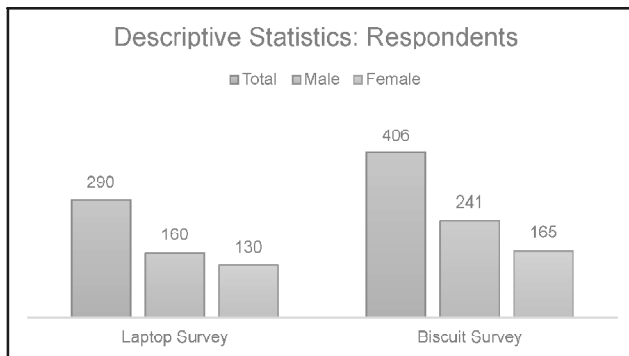


Figure 1 Descriptive Statistics: Respondents

Regarding laptops, 290 respondents participated, of whom 55% were men and 45% were women; 58.9% were married. The average education level of the 290 respondents was above vocational college but lower than university (indicated by 5.365). Their average income was approximately 2.4 million–3.6 million Korean won (indicated by 3.8; see Figure 1 and Table 2). In terms of biscuits, of the 406 respondents, 59% were men and 41% were women; 59.1% were married. Their average

education level was above vocational college but lower than university (indicated by 5.394), and their average income was approximately 2.4 million Korean won (as shown by 2.953; see Figure 1 and Table 2).

The survey was designed to ask respondents whether they used WOM when making purchase decisions and whether they passed recommendations to others as WOM generation. Together credible consumer samples, we asked customers to select all products they had bought, including “air cleaner, laptop, cellphone and N/A” and “can coffee, soft drink, shampoo, biscuit and N/A.” Only respondents who chose “laptop” or “biscuit” were eligible to continue the survey.

For laptops, we found that the probability of WOM generation (0.87) was higher than that of WOM consumption (0.83). Among the 290 respondents, 0.77 generated and consumed WOM, while about 7% of respondents did neither. About 0.06 generated but did not consume WOM, and only 0.10 consumed but did not generate WOM (see Figures 2&3 and Table 2). The correlation between WOM generation and consumption was positive (0.379, $p < 0.00$), shedding some light on the synergy effect between the two.

For biscuits, we found that the probability of WOM generation (0.69) was higher than that of WOM consumption (0.62). Among the 406 respondents, 0.536 generated and consumed WOM, and about 21% of respondents did neither. About 0.167 generated but did not consume WOM; only 0.09 of them consumed but did not generate WOM (see Figures 2&3 and Table 2). The correlation between WOM generation and

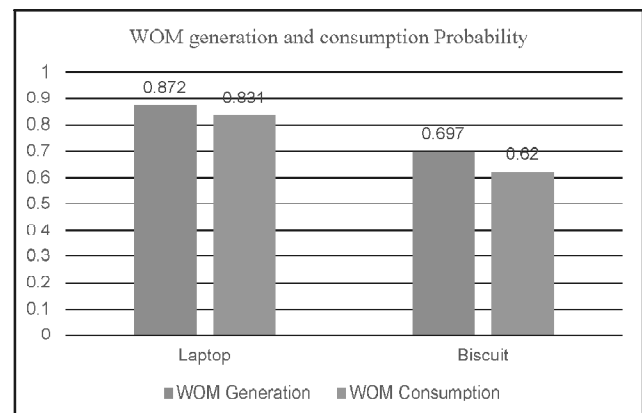


Figure 2: Descriptive Statistics: WOM-1

consumption was positive (0.434, $p < 0.00$), again highlighting the synergy effect between the two.

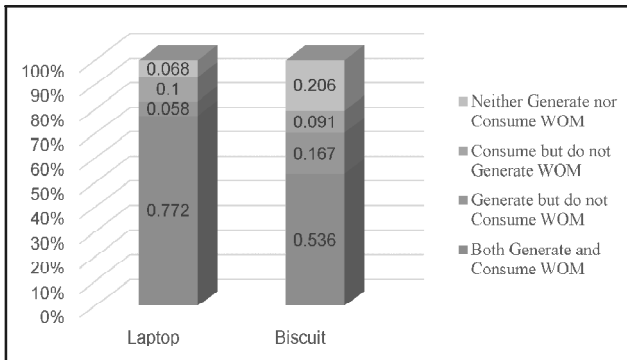


Figure 3: Descriptive Statistics: WOM-2

WOM generation is a binary variable measuring whether a customer conveys WOM to others. WOM consumption is a binary variable measuring whether the customer use WOM when making a purchase decision. WOM can include consumers' experiences with certain brands or product features. In addition, it contains information related to one's overall product experience, media exposure, demo graphics, and places where products were purchased.

Multiple variables have been shown to influence WOM generation and consumption as it relates to product

experience, such as whether the respondent is a first-time buyer, how often the respondent uses the product, and (in the case of this study) how many laptops or biscuits they had purchased before. Additionally, the influence of media such as print newspapers or magazines, television, and the internet are critically important when formulating and consuming WOM. Moreover, consumer demographics including gender, age, education, income, and marital status also shape WOM; see Table 1. Summary statistics are reported in Table 2.

Although cross-sectional data have limitations, these data are unique and valuable for two reasons: first, we measured WOM generation and consumption from the same consumers; and second, compared to many prior studies regarding the relationship between product reviews and aggregate sales at the aggregate level, our data provide an accurate measure of WOM consumption. We explored several variants of the proposed model according to the following specifications: (1) the proposed model, in which we presume that consumers maximize the joint utility from WOM generation and consumption; and (2) incorporating the synergy effect versus assuming it to be 0. To avoid estimating too many parameters, we adopted the linearization specification for all multi-level categorical predictors rather than dummy-coding observations.

Table 1
Variable Definition

| Variable Type | Variable | Definition | Measures | |
|--------------------|-----------------|---|--|---|
| | | | Laptop | Biscuits |
| WOM Generation | WOM Generation | Whether passed WOM to others | Yes=1, no=0 | |
| WOM Consumption | WOM Consumption | Whether used WOM in purchase decision | Yes=1, no=0 | |
| Product Experience | First time | Whether the product is the first bought | Yes=1, no=0 | |
| | Usage | Laptop: Average week/hours used Biscuit: Average week times bought | 1 = 1 or less 2 = 1~4 hours 3 = 5~8 hours 4 = 9-12 5 = 13-16 6 = 17-20 7 = 21-24 | 1 = 1 or less 2 = 2 3 = 3 4 = 4 5 = 5 6 = 6 7 = 7 |
| | Quantity | Laptop: Quantity Biscuit: Consumption Quantity | The Actual Number | |

contd. table 1

| Variable Type | Variable | Definition | Measures | |
|---------------|------------|--|---|----------|
| | | | Laptop | Biscuits |
| Media | Print | Frequency of reading newspapers and magazines | 1= None 2= 1 time per week 3= 2 times per week 4= 3 times per week | |
| | Television | Frequency of watching TV | 5= 4 times per week | |
| | Internet | Frequency of using Internet | 6= 5 times per week 7= 6 times per week 8= 7 times per week | |
| Demographics | Gender | Gender | Male=1, Female=0 | |
| | Age | Age | Age/10 | |
| | Education | Highest Level of Education | 1= Incomplete primary education 2= primary education Completed 3= Secondary Education Completed. 4= High School Education Completed. 5= 2~3 Collage Education Completed 6= University Degree 7= Master Degree or Above. | |
| | Income | Individual Income Level | 1= 1,200,000 or less 2= 1,200,000~2,400,000 3= 2,400,000~3,600,000 4= 3,600,000~4,800,000 5= 4,800,000~6,000,000 6= 6,000,000~7,200,000 7= 7,200,000+ | |
| | Married | Marital Status | Married=1, single=0 | |
| Channel | Shop | Whether bought the product at Laptop: Dealer Biscuit: Super market | Yes=1, No=0 | |

5. ESTIMATION RESULTS

Synergy Effect Between WOM Generation Consumption Estimation

First, the most significant contribution of our research is the detection of the synergy effect between WOM generation and consumption (see Table 3). Our empirical study examined the synergy effect between WOM generation and consumption in two product categories. For both the laptop and biscuit product categories, the synergy effect between WOM generation and consumption was positive, implying that the two activities are complementary and the utility of engaging in both is

higher than the sum of the utility of engaging in only one. It is more desirable for individuals to generate WOM when they consume WOM because WOM consumption helps to accumulate related product knowledge. When knowledge of products accumulates to a certain level, WOM can be generated. Consuming WOM is more desirable when the individual also generates WOM, presumably because the individual expects his or her own WOM generation to be reciprocated; thus, the individual can better enjoy future WOM consumption.

The most important finding of this research concerns the synergy effect between WOM generation and consumption in the laptop category, which is higher than

Table 2
Summary Statistics

| Variables type | Variable | Laptop | | Biscuit | |
|--------------------|--------------------|--------|-------|---------|-------|
| | | Mean | S.D | Mean | S.D |
| WOM Generation | WOM Generation | 0.872 | 0.334 | 0.697 | 0.460 |
| WOM Consumption | WOM Consumption | 0.831 | 0.375 | 0.620 | 0.486 |
| | $Y^G = 1, Y^C = 1$ | 0.772 | 0.419 | 0.536 | 0.499 |
| | $Y^G = 1, Y^C = 0$ | 0.058 | 0.235 | 0.167 | 0.373 |
| | $Y^G = 0, Y^C = 1$ | 0.100 | 0.300 | 0.091 | 0.288 |
| | $Y^G = 0, Y^C = 0$ | 0.068 | 0.253 | 0.206 | 0.405 |
| Product experience | Fist time | 0.341 | 0.479 | 0.236 | 0.425 |
| | Usage | 2.451 | 0.944 | 1.783 | 1.166 |
| | Quantity | 1.668 | 0.730 | 2.67 | 1.609 |
| Media exposure | Print | 3.500 | 1.270 | 3.041 | 1.585 |
| | Television | 4.503 | 1.436 | 4.544 | 1.585 |
| | Internet | 5.596 | 1.250 | 6.105 | 1.562 |
| Demographics | Gender | 0.551 | 0.498 | 0.593 | 0.632 |
| | Age | 3.424 | 1.139 | 3.353 | 1.079 |
| | Education | 5.365 | 1.318 | 5.394 | 1.080 |
| | Income | 3.800 | 1.819 | 2.953 | 1.755 |
| | Married | 0.589 | 0.492 | 0.591 | 0.502 |
| Channel | Shop/Supermarket | 0.582 | 0.500 | 0.514 | 0.500 |

that of the biscuit category. This result indicates that the utility of engaging in both activities in relation to laptops is higher than with biscuits. That is, consumers are more likely to generate and consume WOM simultaneously when buying a laptop than when purchasing biscuits.

Table 3
Estimate of the Synergy effect

| | Estimate | SE |
|---------|--------------|-------|
| Laptop | 2.66 | 0.471 |
| Biscuit | 1.938 | 0.255 |

Note: Bold estimates are significant at the 5% level.

WOM Consumption Estimation

Next, we discuss our findings on WOM consumption (see Table 4). Regarding laptops, first-time buyers were found to be more likely to consume WOM, consistent with the hypothesis that limited product knowledge may lead to a stronger consumer need for WOM to inform purchase decisions. We also discovered that consumption quantity

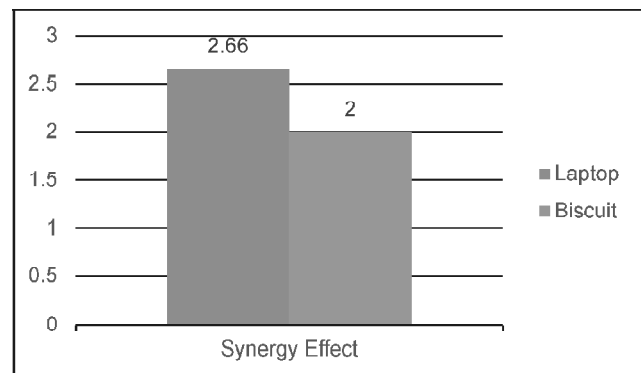


Figure 4: Estimate of the Synergy Effect

had a positive effect on WOM consumption. Above all, more product experience makes it easier to process new information and may signal higher consumer interest in a product, thus leading to a higher propensity to search for information and consume WOM.

In terms of biscuits, consumption quantity had a positive effect on WOM consumption. Again, more product experience makes it easier to process new

information and may evoke greater consumer interest in a product, thus leading to a greater tendency to search for information and consume WOM. Hence, coincident with our expectations, consumer product experience was positively correlated with consumers' propensity for WOM generation. As for the effect of media exposure, we detected a negative relationship between internet usage and WOM consumption. This could be due to the internet's interactive environment and the rapid development of online social communities where product reviews and recommendations involving WOM are widely available. Consumers' likelihood of consuming WOM may therefore be inherently high.

Table 4
Estimates in the WOM Consumption Equation

| | | <i>Laptop</i> | | <i>Biscuit</i> | |
|------------|------------|-----------------|------------|-----------------|------------|
| | | <i>Estimate</i> | <i>S.E</i> | <i>Estimate</i> | <i>S.E</i> |
| | Intercept | -3.35 | 1.18 | -1.07 | 0.59 |
| Product | First Time | 2.477 | 0.573 | 0.238 | 0.304 |
| Experience | Usage | -0.216 | 0.186 | 0.114 | 0.120 |
| | Quantity | 0.680 | 0.297 | 0.413 | 0.109 |
| Media | Print | 0.113 | 0.148 | 0.089 | 0.079 |
| Exposure | Television | 0.060 | 0.133 | 0.107 | 0.065 |
| | Internet | 0.193 | 0.15 | -0.180 | 0.080 |

Note: Bold estimates are the ones that are significant at the 5% level.

WOM Generation Estimation

Lastly, we will discuss our findings regarding WOM generation (see Table 5). First-time laptop buyers were less likely to generate WOM. However, consumer product experience was positively correlated with WOM generation

Table 5
Estimates in the WOM Generation Equation

| | | <i>Laptop</i> | | <i>Biscuit</i> | |
|------------|------------|-----------------|------------|-----------------|------------|
| | | <i>Estimate</i> | <i>S.E</i> | <i>Estimate</i> | <i>S.E</i> |
| | Intercept | -0.121 | 1.21 | -1.49 | 0.536 |
| Product | First Time | -1.03 | 0.477 | 0.362 | 0.275 |
| Experience | Usage | 0.338 | 0.234 | 0.390 | 0.102 |
| | Quantity | -0.011 | 0.30 | -0.013 | 0.070 |
| Media | Print | -0.015 | 0.166 | -0.024 | 0.073 |
| Exposure | Television | 0.118 | 0.143 | 0.128 | 0.061 |
| | Internet | -0.121 | 0.164 | 0.033 | 0.074 |

Note: Bold estimates are the ones that are significant at the 5% level.

propensity when buying biscuits in the sense that first-time buyers do not usually possess a full understanding of the product and are therefore less likely to generate WOM. Moreover, we found WOM generation to be positively correlated with consumer media exposure; specifically, consumers who watch TV generate WOM more easily.

6. MANAGERIAL IMPLICATIONS

From the above empirical analysis, we found a positive synergy effect between WOM generation and consumption in the laptop and biscuit product categories. Considering that participation in one activity may encourage participation in the other, WOM generation and consumption can be used in a complementary manner in consumer preferences. The synergy effect between WOM generation and consumption in the laptop category was higher than in the biscuit category. These results findings can thus be applied in laptop and biscuit companies when managing WOM communication.

Companies must stimulate either WOM consumption or generation to incite the other due to the complex correlations between both factors. Hence, WOM campaign managers should be encouraged to persuade consumers to generate as well as consume WOM. The WOM process is beneficial to consumers' decisions and benefits companies substantially. Furthermore, purchase experiences and varied information exposure can also stimulate WOM generation and consumption.

7. CONCLUSION AND DISCUSSION

To apply WOM as an effective marketing tool, a comprehensive understanding of the synergy effect between WOM generation and consumption and respective driving factors is critical. In this paper, we investigated these important issues by applying a model to account for interdependent/synergy effects between WOM generation and consumption. This research was based on the aforementioned model to survey data laptop and biscuit products. The estimated results revealed that consumer product experience and media exposure have a significant impact on WOM activities in both categories.

We also identified a strong synergy effect between WOM generation and WOM consumption. For both the

laptop and biscuit product categories, the synergy effect between WOM generation and WOM consumption is positive, suggesting that the two activities are complementary and the utility of engaging in both is higher than the sum of the utility of engaging in one. This finding provides managerial implications for laptop and biscuit companies. A viable targeting strategy would be to seek out active WOM consumers and generators with a positive synergy effect to achieve more effective communication through WOM.

However, this article has limitations, and the findings are only a starting point for further study. To provide a clear explanation of product involvement affecting WOM generation and consumption behaviors, we examined two product categories using the econometric model proposed by Yang et al. (2012). However, our empirical study was correspondingly limited by these two categories. Product diversity in terms of high and low involvement is essential for further analyzing the relationship between product involvement and WOM generation and consumption. On one hand, from a WOM generation point of view, customers with high product involvement (vs. low), sufficient product knowledge, and professionalism are likely to influence others' behavior. Thus, high product involvement increases the likelihood of WOM generation. On the other hand, from a WOM consumption perspective, customers with high product involvement will likely be more interested in searching for product information when making purchase decisions, thus leading to a greater likelihood of WOM consumption. It is thus beneficial for companies to leverage the synergy effect of WOM generation and consumption for high and low product involvement. Therefore, companies are encouraged to manage their WOM activities effectively and efficiently. This paper also has limitations related to data collection and questionnaire design. Cross-sectional data can be biased because respondents' self-reported answers may be overly subjective. According to the key paper on which this work was based, the questionnaire design should be improved.

NOTES

1. Nielsen Company (2013), Global Trust in Advertising and Brand Messages(2013). Report, Nielsn, New York. <http://www.nielsen.com/us/en/insights/reports/2013/global-trust-in-advertising-and-brand-messages.html>
2. "Utility" is used in the language of random utility models, not necessarily anything accruing to, or experienced by, consumers.
3. Nielsen Company (2013), A MULTI-MIX MEDIA APPROACH DRIVES NEW PRODUCT AWARENESS, Report, Nielsn, New York.<http://www.nielsen.com/us/en/insights/news/2013/a-multi-mix-media-approach-drives-new-product-awareness.html>

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