

December 2006

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Recommended Citation

Awad, Neveen; Dellarocas, Chrysanthos; and Zhang, Xiaoquan, "The Digital Divide of Word of Mouth" (2006). *MWAIS 2006 Proceedings*. 19.
<http://aisel.aisnet.org/mwais2006/19>

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The Digital Divide of Word of Mouth

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ABSTRACT

Through the proliferation of online chat rooms, online review sites, and online ratings, information technology (IT) has vastly magnified the potential impact of word of mouth. To date, minimal research has examined the relationship between online and offline word of mouth. We explore the factors associated with the variation in use of, and participation in word of mouth in these two contexts through a nationally representative sample of users as well as through actual online ratings data. We show that participation in and use of online word of mouth is a complement to participation in and use of offline word of mouth. However, participation in online word of mouth has a negative association with use of traditional offline word of mouth. In addition, the use of online word of mouth is a substitute for traditional advertising, such as television advertisements.

KEYWORDS

Online word of mouth, online consumers, online marketing

INTRODUCTION

One of the most intriguing social phenomena brought forth by advances in information and communication technologies is the vast amplification of the power of word-of-mouth. With the help of the Internet, wireless networking, and mobile telephony, today's citizens and consumers are forming an array of technology-mediated communities where they exchange opinions and experiences on companies, products, services, and even world events. Approximately 50% of young Net surfers rely on online recommendations to purchase CDs, movies, Videos/DVDs, and games (Forrester Research, 2000); however, according to our results, only 7% of users participate in online word of mouth. What factors attribute to this differential? More specifically, what factors contribute to users participating in, or referencing online versus offline word of mouth? Despite the wealth of research on online word of mouth, these questions have not been extensively explored.

This research makes valuable contributions to three fields of research. First, it contributes to the word of mouth literature by exploring participation, and use, and informational value across two varying contexts, online and offline. We conducted a survey where a nationally representative sample of subjects was asked about their participation in, and use of, offline and online word of mouth. In addition, the subjects were asked to rate a list of recently released movies. From this survey, we were able to compare participation in, and use of online versus offline word of mouth. In addition, we were able to compare ratings provided through the survey with online ratings of the same movie, to assess the information value of online ratings versus offline ratings. Second, this research contributes to the IS literature by contrasting adoption of word of mouth in the online versus offline environment. Third, this research contributes to the marketing literature by examining the use of word of mouth relative to other types of product promotion, such as television advertisements and Internet advertisements, towards affecting the user consumption decision.

PREVIOUS WORK

For decades, researchers have shown that informal exchanges of information among acquaintances influence consumers' choices and purchase decisions (Bass, 1969; Arndt, 1967; Whyte, 1954), as well as shape consumers' expectations (Zeithaml and Bitner 1996), pre-usage attitudes (Herr et al. 1991), and post-usage perceptions of a product or service (Bone 1995; Burzynski and Bayer 1977). The influence of *offline* word of mouth has been reported to be greater than print ads, personal selling, and radio advertising (Engel et al. 1969; Feldman and Spencer 1965; Katz and Lazarsfeld 1955), although Van den Bulte and Lilien (2001a) suggest that some of those effects may have been overstated. However, little research to date has

compared the relative affects of *online* word of mouth to traditional means of consumer conversion, such as print and television ads; thus, such is one of the goals that drives our paper.

Online interactions between strangers are facilitated by online communities, and specifically reputations systems (Resnick and Zeckhauser 2002, Dellarocas 2003a). The effectiveness of these online ratings systems, and therefore the use of them, depends upon user participation. As such, there is a vast amount of literature on the antecedents of participation and use in the *offline* setting (e.g. Sundaram et. al 1998). Certain types of consumers have been found to seek out offline word of mouth, including: consumers with little expertise in a product category (Furse et al. 1984; Gilly et al. 1998), consumers who perceive a high risk in decision-making (Bansal and Voyer 2000; Kiel and Layton 1981), and consumers who become engrossed in the purchase decision (Beatty and Smith 1987). Antecedents of offline word of mouth include: extreme satisfaction or dissatisfaction (Dichter 1966; Richins 1983; Yale 1987), commitment to the firm (Dick and Basu 1994) and novelty of the product (Bone 1992).

However, a distinct difference in offline word of mouth and online word of mouth is knowledge of the source. In offline word of mouth, it is often a friend, coworker, or acquaintance that is providing the recommendations, as such various factors have been found to influence the perceived value of the recommendations, such as source expertise (Bansal and Voyer 2000; Gilly et al. 1998), strength of ties (Brown and Reingen 1987; Frenzen and Nakamoto 1993), demographic similarities (Brown and Reingen 1987) and perceptual affinity (Gilly et al. 1998). However, such factors likely do not have the same influence on *online* word of mouth recommendations, as most consumers do not personally know the other consumers who are posting recommendations. For example, Mayzlin (2001) finds that rational consumers still pay attention to anonymous on-line posts, even when it is possible for firms to pose as online consumers.

In the online setting, a few studies have examined user motivation to participate in online word-of-mouth in various settings, such as the e-Bay reputation system (Dellarocas, Fan, and Wood, 2003), online discussion boards for technical support (Gu and Jarvenpaa, 2003), online professional legal association forum (Wasko and Faraj, 2004), and online product reviews (Hennig-Thurau et al 2004). While we also examine a setting of online product reviews, the key differentiator of our study is that we contrast participation in, and use of, online versus offline word of mouth. To our knowledge, all previous studies to date examine either online or offline word of mouth; ours is the first to aim to contrast the two settings in the same paper. We examine both use and participation in online ratings in the context of online movie reviews. A number of factors make the motion picture industry an ideal test bed for this type of study. First, it is an industry where word-of-mouth plays an important role. Second, there is widespread availability of movie ratings on the Internet; the most popular sites (Yahoo! Movies, IMDB) receive hundreds of ratings within hours of a new movie's release. Third, production, marketing and daily box office data are easily available for most movies, making it easy to correlate the evolution of online ratings to traditional marketing investments.

HYPOTHESES

Complementary Participation in Online and Offline Word of Mouth

Consumers have been shown to participate in offline word of mouth due to several main factors, including: extreme satisfaction or dissatisfaction with the product or purchasing experience (Dichter 1966; Richins 1983; Yale 1987), commitment to the firm (Dick and Basu 1994) and novelty of the product (Bone 1992). Given the primary factors affecting word-of-mouth participation have to do with the product, the firm, and the purchasing experience, it is reasonable to stipulate the consumers who are driven to share their experiences verbally, and thus participate in offline word of mouth, may also be similarly driven to share their experiences electronically, and therefore participate in online word of mouth. Consequently, we hypothesize that participation in online WOM is a complement to participation in offline WOM; people that participate in offline word of mouth are also more likely to participate in online word of mouth, and vice versa

Hypothesis 1a: People that participate in offline word of mouth are also more likely to participate in online word of mouth.

Hypothesis 1b: People that participate in online word of mouth are also more likely to participate in offline word of mouth.

Complementary Use of Online and Offline Word of Mouth

Just as certain factors are characteristic of consumers that participate in offline word of mouth, so is the case regarding consumers who *use* offline word of mouth. Consumers that seek out word of mouth recommendations the most can usually be classified by the following factors: have little expertise in a product category (Furse et al. 1984; Gilly et al. 1998), perceive a high risk in decision-making (Bansal and Voyer 2000; Kiel and Layton 1981), and become engrossed in the purchase decision (Beatty and Smith 1987). These factors are all consumer-specific factors, and thus it is again reasonable to stipulate

that consumers who seek out offline word of mouth recommendations may also utilize online word of mouth recommendations. Consequently, we hypothesize that use of online is a complement to use of offline word of mouth; people that use offline word of mouth are also more likely to use online word of mouth, and vice versa

Hypothesis 2a: People that use offline word of mouth are also more likely to use online word of mouth.

Hypothesis 2b: People that use online word of mouth are also more likely to use offline word of mouth.

Intra-Context Use and Participation

We would expect participation in a given medium, offline or online, to be positively associated with use of word of mouth in the same medium; presumably those that offer word of mouth recommendations in a given medium also heed the reference of others in that medium. Consistency theories suggest that users maximize the internal consistency of their cognitive systems and lower the overall mental “costs” associated with informational acquisition (Fishbein and Ajzen, 1975). In addition, previous research has shown that consumers that favor a channel (online or offline) for product purchases, and repeatedly use that channel (Ward and Morganosky 2003). Consequently, we hypothesize that participation in online word of mouth is a complement to use of online word of mouth, and participation in offline word of mouth is a complement to use of offline word of mouth.

Hypothesis 3a: People that participate in online word of mouth are also more likely to use online word of mouth.

Hypothesis 3b: People that participate in offline word of mouth are also more likely to use offline word of mouth.

Inter-Context Use and Participation

When comparing participation and use across contexts, we expect slightly varying results from intra-context participation and use; Granovetter (1973) first documented the important insight the information flows quickly within groups but slowly across them. As such, participation in offline word of mouth is expected to be more common than use of online word of mouth (as evidenced by the dispersion in our survey results as summarized in Table 1). Thus, we expect participation in offline word of mouth to be correlated with use of online word of mouth, i.e. we expect that those that reference online ratings for movie selection probably share their findings with friends and fellow movie-goers. This expectation is stated in the following Hypothesis:

Hypothesis 4a: Users that participate in offline word of mouth are also more likely to use online word of mouth.

However, we expect the population of users that participate in online word of mouth to be rather different than the average user, as such, we expect that participation in online word of mouth will have a negative relationship with use of offline word of mouth. We expect this for several reasons: 1) Online customers have more information available to them and therefore expend more cognitive effort to realize addition benefits (Johnson and Payne, 1985); 2) The Computer Mediated Environment represents a “fundamentally different environment”, whereby consumers: “exercise unprecedented control over the management of content with which they interact” (Hoffman and Novak, 1996). It is our expectation that people who participation in online word of mouth communities value this control, and thus will not significantly value traditional word of mouth recommendations. This leads us to the following hypothesis:

Hypothesis 4b: People that participate in online word of mouth will not have a significant likelihood to use offline word of mouth in making their consumption decision.

Online Word of Mouth as a Substitute for Traditional Means of Customer Conversion

The impact of offline word of mouth on product sales was first modeled by Bass (1969). The Bass model has been shown capable of predicting the growth pattern of a wide range of new products with minimal data. In addition, the influence of *offline* word of mouth has been reported to be greater than print ads, personal selling, and radio advertising (Engel et al. 1969; Feldman and Spencer 1965; Katz and Lazarsfeld 1955). Thus, since offline word of mouth has been shown to have such a strong influence on consumer purchasing behavior, we expect that online word of mouth will serve as a substitute to more traditional means of information dissemination to consumers, such as advertising. Thus, we hypothesize that online word of mouth is a substitute for another traditional source of information: advertising.

Hypothesis 5: People that use online word of mouth for making movie consumption decisions will not report significant use of television advertisements.

Online Word of Mouth as a Complement to Online Advertising

Increasing numbers of consumers are coming online. As the Internet becomes an increasingly viable commercial medium, firms are budgeting significant dollar amounts for online advertising. The Internet Advertising Bureau (1999) reported 1998 online advertising expenditure of \$1.92 billion, more than double 1997 revenues. The consumer population that participates in online word of mouth, likely also participates in various communities and portals online, and therefore has a greater exposure to online advertising. Thus, we hypothesize that online word of mouth is a complement to online advertising.

Hypothesis 6: People that use online word of mouth for making movie consumption decisions will also report use of online advertisements.

SURVEY DATA

An initial structured questionnaire was developed based on a review of the existing literature. The survey asked respondents to rate 25 recently released movies on the same ten-point scale used by an online movie rating site; it also asked a series of questions regarding Internet usage, frequency of use of online forums, and demographic information, including age, gender, and geographic location. The survey was developed and pre-tested for content, flow, scope, and purpose on a group of undergraduate business students. The respondents were asked to comment on questions, to demarcate ambiguities, and to introduce any factors that may have been omitted. The questionnaire was refined based on initial feedback. The final questionnaire had fourteen questions related to various constructs, and twenty-five rating questions.

The survey was implemented in a web-based survey system, and emailed out during the summer of 2003 to over 3000 randomly selected respondents from a nationally representative pool that MarketTools, Inc. owns. We received a total of 2007 respondents, 37 of which had significant missing data, leaving 1970 of useable responses.

EMPIRICAL MODEL

Since participation in offline or online word of mouth are both binary variables, problems would arise if we treated the dependent variable as continuous and estimate a multiple regression model: First, the ordinary least squares estimates would be inefficient. Second, prediction from the model would not be restricted to the interval [0, 1]. Thus, given that consumers make a choice whether or not to use and participate in offline and online word of mouth, we use a discrete choice model to examine such a joint decision that the user makes. We start by defining the underlying propensity to participate/propensity to use variable Y_h^* for each context, online and offline word of mouth ($h=OnUse, OffUse, OnPart$ and $OffPart$). Such propensities are associated with user characteristics X_h and unobserved characteristics ε_h . Thus, the linear regression function is:

$$Y_h^* = X_h' \beta_h + \varepsilon_h \quad (h = OnUse, OffUse, OnPart, \text{ and } OffPart) \quad (1)$$

Equation 1 is then translated into a binary Probit equation for each measure (participation in and use of online and offline word of mouth) with the following mapping:

$$YBI_h = \begin{cases} 0 & \text{if } Y_h^* \leq 0 \\ 1 & \text{if } Y_h^* > 0 \end{cases} \quad (h = OnUse, OffUse, OnPart, \text{ and } OffPart) \quad (2)$$

The model assumes that ε_h ($h = OnUse, OffUse, OnPart$, and $OffPart$) jointly follow a quadrivariate with mean 0 and covariance matrix Σ . That is, $(\varepsilon_{OnUse}, \varepsilon_{OffUse}, \varepsilon_{OnPart}, \varepsilon_{OffPart})' \sim MVN(0, \Sigma)$. Seeing as the magnitude of the variance cannot be identified for each Probit equation (Greene, 2003), we assume $Var(\varepsilon_h) = 1$. The overall model therefore is a multivariate Probit model.

Given that use and participation in word of mouth (online and offline)¹ are not mutually exclusive activities, the multivariate Probit model is appropriate, as the error terms across the separate equations are likely correlated. The multivariate Probit (MVP) model allows for a correlation of the error terms for the same individual across the various decisions.

The MVP Model is estimated by the method of simulated maximum likelihood (SML). The variance-covariance matrix of the cross-equation error terms has values of 1 on the leading diagonal, and the off-diagonal elements are correlations to be estimated. For each observation, a likelihood contribution is calculated for each replication, and the simulated likelihood contribution is the average of the values derived from all the replications. The simulated likelihood function for the sample as a whole is then maximized (Cappellari, 2003).

RESULTS

Examining first the relationship of WOM relative to other traditional sources of information, the results suggest that online word of mouth is a substitute for traditional television advertising. The populations of users that participate in online word of mouth do *not* identify television advertising as playing a significant role (β : -0.028, $p < 0.680$); whereas the population of consumers who participate in offline word of mouth do identify television advertising as a significant factor in their movie consumption decision making (β : 0.406, $p < 0.000$). These results support hypotheses 5. The confirmation of hypothesis 5 may be an initial sign that as people increasingly participate in online word of mouth, the effectiveness of television advertisements may likely diminish. In contrast, *online* advertising is a complement to online word of mouth. The populations of users that use, as well as participate in online word of mouth, do identify Internet advertising as playing a significant role in their movie consumption decisions (Participation: β : 0.482, $p < 0.000$; Use: β : 0.815, $p < 0.000$); whereas the population of consumers who participate in offline word of mouth do *not* identify Internet advertising as a significant factor in their movie consumption decision making (β : 0.054, $p < 0.532$). This result supports hypothesis 6, and suggests that not only are traditional advertising media diminishing in impact, but the new medium of Internet advertising will likely continue to grow in impact as increasing number of consumers become active online users.

Online Word of Mouth and Offline Word of Mouth: Substitutes or Complements?

In order to examine whether online and offline word of mouth are complements or substitutes, we examine the estimated covariance structure of the latent utilities through the estimated correlation ρ_{ji} in the variance-covariance matrix of cross-equation error terms.

Offline Word of Mouth

PARTICIPATION

The results suggest that participation in offline traditional word of mouth is complementary to both participation (0.198, $p < 0.001$), and use (0.193, $p < 0.001$) of *online* word of mouth. These results support hypotheses 1a and 4a. Thus, people that make word of mouth recommendations to other people are also more likely to post ratings online, as well as to reference online ratings. In addition, participation in offline traditional word of mouth is also complementary to *use* of offline word of mouth (0.224, $p < 0.001$); this result support hypothesis 3b and suggests that those that offer word of recommendations, also reference other people's recommendations in their decision making.

USE

Similarly, use of offline word of mouth is a complement to use of online word of mouth; people that use offline word of mouth are also more likely to use online word of mouth when making their movie consumption decisions (0.305, $p < 0.001$), and vice versa. These result support Hypotheses 2a and 2b and suggest that just as offline word of mouth has great predictive properties for the revenue cycle of goods (Bass, 1969) so should online word of mouth have similar predictive strength. Firms may wish to harness such power in order to be more responsive to the needs of their consumers.

¹ It should be noted that there is a much larger sample of users that participate in offline word of mouth (recommending movies to other people) than online word of mouth (online reviews and ratings). Whereas 1645 people responded that they participate in offline word of mouth, only 147 respondents said they participated in online word of mouth.

Online Word of Mouth

PARTICIPATION

The results suggest that participation in online word of mouth is complementary to participation (0.198, $p < 0.001$) in offline word of mouth; this result supports hypothesis 1b. Thus, people that post ratings online are also more likely to make word of mouth recommendations to other people. In addition, participation in online word of mouth is complementary to use of online word of mouth (0.335, $p < 0.001$); this result support hypothesis 3a and suggests that those that post ratings online also reference other people's online ratings in their decision making. Interestingly however, the only result which suggests a substitution effect is that of participation in *online* word of mouth and use of *offline* word of mouth. In support of hypothesis 4b, the results suggest that participation in online word of mouth is negatively correlated with use of *offline* word of mouth (-0.095 , $p < 0.01$). While this result is less statistically significant than the others, it is interesting to note that while use of online WOM of mouth is complementary to use of Offline word of mouth (as noted above) participation is not. We conjecture that the population of users that participate in online word of mouth favor online medium to such a degree that they do not even utilize traditional medium messages anymore. This stipulation is further supported by the fact that there is no significant correlation for the use of television advertisements in the online word of mouth participation equation ($\beta = -0.028$, $p < 0.680$), where as Internet advertisements were significant and positively correlations with online word of mouth participation ($\beta = 0.482$, $p < 0.000$). In the next section, we further explore the correlation of online ratings with offline expenditures through the use of actual online ratings data.

DISCUSSION

The question of whether online word of mouth and offline word of mouth are complements or substitutes is one that appears to have an evolving answer. The results of the paper suggest that online word of mouth and offline word of mouth are complements when people are either: 1) using online word of mouth and offline word of mouth; 2) participating in offline word of mouth and online word; and 3) participating in offline word of mouth and using online word of mouth. In addition, the informational value of online word of mouth complements that of offline word of mouth. The only case where online word of mouth seems to be a *substitute* for use of offline word of mouth is when users are participating in online word of mouth, as participation in online word of mouth was significant and negatively related to use of offline word of mouth. It will be interesting to watch the evolution of this relationship over time as the population of users that participates in online word of mouth continues to grow. For example, the Pew Internet & American Life Project found in a 2003 survey that 26% of U.S. adult internet users have participated in online word of mouth. Such a result exhibits more than a three-fold increase from the 7% reported by Forrester Research in 2000. Thus, as the population of users that participate in online word of mouth continues to grow and evolve, we expect online word of mouth and offline word of mouth to grow to be complements in every sense.

In a similar vein, as online word of mouth continues to grow, we expect that the value of traditional media marketing, such as television advertisements, to continue to diminish. The results of this paper showed that users that participate in or use online word of mouth report no significant value of television advertisements in making their consumption decisions. Thus, firms must carefully consider their marketing strategies, both from a content perspective, and from a channel perspective, so as to optimize revenues.

CONCLUSION

This paper is the first to examine the relationship between online word of mouth and traditional source of information, such as offline word of mouth, and advertising. Initial results suggest that while participation in online word of mouth is a complement to participation in offline word of mouth, and use of online word of mouth is a complement to use offline word of mouth, participation in online word of mouth is a *substitute* for use of offline word of mouth. Looking forward, academics and practitioners alike should be weary that online word of mouth may eventually take the place of traditional advertising.

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