J. of the Acad. Mark. Sci. (2007) 35:233–249
DOI 10.1007/s11747-007-0037-1

# The chain from customer satisfaction via word-of-mouth referrals to new customer acquisition

**Florian v. Wangenheim · Tomás Bayón**

Published online: 27 April 2007


**Abstract** It has often been argued that word-of-mouth (WOM) can contribute significantly to a firm's success in a variety of ways. Here, we analyze the functional linkage between customer satisfaction, WOM, and new customer acquisition. Using data from two empirical studies we conceptualize and test the direct, non-linear, and moderated relationship between satisfaction and WOM. We further explore the circumstances under which WOM leads to new customer acquisition using a logistic regression model. We do so for two groups (new customers and long-term customers) from the customer base of a large energy provider ($n$=688), and for a random sample of B2B customers ($n$=416) in the same market. Results indicate that the satisfaction-WOM link is non-linear and is moderated by several customer involvement dimensions. Based on our results, we demonstrate how the satisfaction-WOM-new customer acquisition link can enrich return on quality and satisfaction models. Further, we draw conclusions about how companies can make use of both the satisfaction-WOM and the WOM-new customer acquisition link for better allocating their marketing resources.

**Keywords** Word of mouth · Customer acquisition · Return on quality · Customer satisfaction · Involvement

This paper is based on the first author's doctoral dissertation.

F. v. Wangenheim (✉)
Services and Technology Marketing, TUM Business School, Technical University Munich, Munich, Germany
e-mail: florian.wangenheim@udo.edu

T. Bayón
School of Business Administration, International University in Germany, Campus 1, 76605 Bruchsal, Germany
e-mail: tomas.bayon@i-u.de

During the last decades customer satisfaction and perceived service quality have been important topics in the marketing literature (e.g. Parasuraman et al. 1985; Oliver 1997). This is due to the empirically verified belief that increases in satisfaction and quality will eventually result in higher profitability (Anderson et al. 1994; Fornell et al. 1996). Over the past 10 years however the focus of research on satisfaction and quality has slowly shifted from understanding how service quality perceptions and satisfaction judgments are formed to a more outcome-oriented view of assessing the returns on service quality and satisfaction based on a thorough understanding of the associated costs and benefits (e.g. Rust et al. 1995).

This development has given rise to a number of conceptual models and empirical studies on quantifying the economic outcome of service quality and customer satisfaction on measures such as revenues or profitability, most notably the satisfaction-profit chain (Anderson and Mittal 2000), the return on quality model (Rust et al. 2002, 1995) and the service-profit chain (Heskett et al. 1994; Kamakura et al. 2002). In the following, we will refer to such models as ROQ/CS (Return on Quality/Customer Satisfaction) models. The primary common feature of those models is that marketing expenditures for increasing service quality/customer satisfaction are viewed as investments, and ROQ/CS models are designed to determine their economic returns.

In virtually all described models (Anderson and Mittal 2000; Bolton et al. 2004; Heskett et al. 1994; Rust et al. 1995), WOM is recognized as both a consequence of service quality/customer satisfaction and an antecedent to revenue and profit due to new customer acquisition.

However, as this effect was often deemed too difficult to quantify (e.g., Rust et al. 1995, 2004), it is considered, if at all, only on a conceptual basis, and is always ignored when it comes to empirically quantifying economic returns of quality/satisfaction (Kamakura et al. 2002; Rust et al. 2002). This gap in research has been pointed out repeatedly, and the question "How can word-of-mouth communication from retained customers be quantified?" (Zeithaml 2000, p.77) has been named a key research avenue to pursue.

Therefore, a key challenge for integrating WOM into ROQ/CS models is to measure the relationship between service quality/satisfaction, WOM, and new customer acquisition. We do so by studying the antecedents of the number of WOM referrals by an individual customer and the antecedents of making a purchase decision after having received a WOM referral for the respective provider. A feature of our model is that it generally works with cross-sectional survey data, which, as Rust et al. (2004) point out, is an advantage due to its ease of implementation, but is obviously also a limitation to the well-known problems of common-method bias and potential recall problems. In our empirical and discussion sections we will focus on how to best address these types of problems.

In sum, the objectives of the study are threefold: a) to analyze how satisfaction translates into positive WOM and how positive WOM converts into the acquisition of new customers; b) to explore moderating and non-linear effects; and c) to show how WOM can be integrated into ROQ/CS and CLV models and compute, drawing from our empirical findings, the return on satisfaction increases in the form of new customers through WOM. This paper contributes to the literature in two central areas. First, while studies exist which focus on either the satisfaction-WOM link (e.g., Anderson 1998) or the WOM-new customer link (e.g., Bansal and Voyer 2000), no empirical research to date has examined the complete chain from satisfaction, via WOM, to new customer acquisition. By doing so, we address so far unresolved or widely disregarded issues regarding the modeling of WOM and its effect on buying decisions, including moderating and non-linear effects. Second, we show how WOM can be integrated into ROQ/CS models and, drawing from our empirical findings, compute the return on satisfaction increases in the form of new customers through WOM.

In the following section, we develop a conceptual model for linking customer satisfaction to WOM referrals to new customer acquisition. Next, we discuss both the determinants of WOM and its effectiveness (i.e., its influence on new customer acquisition). Subsequently, the model is applied and hypotheses are tested in two empirical studies.

The key dependent variables in our approach are "number of WOM referrals" and "effect of WOM on a purchase decision." We will measure "number of WOM referrals" as the amount of referrals given by an individual customer in a defined time period, and infer the "effect of WOM on a purchase decision" from a model in which we compare purchase likelihoods with and without purchase recommendations. Next, we show how our model can be used for computing the return on quality or satisfaction as measured in new customers acquired through WOM. Finally, we discuss how marketing investment calculations can be improved by accounting for WOM, and which customers represent the most promising targets for WOM campaigns.

## Word of mouth referrals and new customer acquisition

For understanding the relationship between customer satisfaction, WOM, and new customer acquisition, it is important to consider both the number of referrals given and the conversion rate, as outlined in the following formula (assuming, for the sake of simplicity, that the time interval $t$ is one for each observation):

$$V_{\mathrm{WOM}} = y \cdot \Delta\mathrm{Prob}(\mathrm{Purchase})_{\mathrm{WOM}} \quad (1)$$

where $V_{\mathrm{WOM}}$ equals the number of clients acquired through referrals, $y$ denotes the number of referrals given by all customers of the firm, and $\Delta\mathrm{Prob}(\mathrm{Purchase})_{\mathrm{WOM}}$ represents the conversion rate (i.e., the increase of the probability that a referral results in the acquisition of a new customer). By denoting this as a marginal value, we acknowledge the fact that even when WOM referral receptions are followed by a purchase, they will often not be the only relevant information source affecting the purchase. For an individual customer $i$, this can be rewritten as

$$V_{\mathrm{WOM}(i)} = y_i \cdot \Delta\mathrm{Prob}(\mathrm{Purchase})_{\mathrm{WOM}} \quad (2)$$

Formulas (1) and (2) show that for understanding the customer satisfaction-WOM-new customer acquisition link, it is necessary to parameterize the relationship between customer satisfaction and the number of WOM referrals, as well as the relationship between WOM referrals and new customer acquisition (i.e., the conversion process). In the following, we will confine most of our attention to understanding how the number of WOM referrals given by an individual customer can be predicted, because the conversion rate is much more difficult to influence for a company than is the number of WOM referrals—whether a customer gives referrals is far more subject to influence by service quality/satisfaction management than is the conversion rate. Whether or not a referral is effective (i.e., results in the acquisition of a new client) primarily depends on the relationship between sender and receiver, and is therefore much harder for managers to influence. Further, the conversion rate may vary not only across WOM senders,

but also for the same WOM sender, because different receivers may deviate in their perceptions of the sender's credibility or expertise on the subject, which eventually affects the probability of a referral-induced purchase. Finally, receivers may differ in their perception of perceived risk associated with a product class, which also has an effect of WOM influence on purchase decisions (Arndt 1967; Murray 1991).

## Modeling the satisfaction-WOM link

The central variable discussed in the literature as affecting WOM is customer satisfaction, and there is no shortage of research linking customer satisfaction to WOM (e.g., Anderson 1998; Swan and Oliver 1989; Westbrook 1987). Customer satisfaction has been defined as a pleasurable level of consumption-related fulfillment (Oliver 1997). Not surprisingly, studies have consistently shown positive WOM to be an outcome of high customer satisfaction ratings (e.g., Sudaraman et al. 1998; Swan and Oliver 1989; Westbrook 1987). Hence, it is quite clear that the satisfaction-WOM-link exists.

However, it must also been noted that some research gaps exist regarding the functional form of the relationship between satisfaction and WOM. Beyond the common agreement that customer satisfaction is positively linked to WOM referrals, not much is known about the functional form or moderating forces of the relationship. Neglected areas of research include: WOM behavior vs. WOM intentions, WOM likelihood vs. WOM frequency, and non-linearity and moderating effects of the satisfaction-WOM link. In the following, we will discuss each of these issues in turn.

### *WOM behavior vs. intentions*

Although, as noted above, many studies link customer satisfaction to WOM (e.g., Anderson 1998; Swan and Oliver 1989; Westbrook 1987), few of them consider WOM *behavior*, i.e., the number of referrals given instead of *WOM intention*, or the *likelihood to recommend* as outcome measure. For quantifying the return on satisfaction increases, customer behavior rather than intentions should be analyzed for at least two reasons: first, it is customer behavior that ultimately drives lifetime value, and second, stated intentions have often been shown to be a weak predictor of behavior (Morwitz 1997a).

### *WOM likelihood vs. WOM frequency*

When trying to understand and model frequency data (such as the number of WOM referrals given by an individual), it is important to note that, in fact, two questions are to be addressed: first, whether or not a WOM referral is made, and second, how many are made, conditional on the fact that at least one WOM referrals is given. Bowman and Narayandas (2001) explicitly model this two-step process, although they do not focus on explaining whether different effects on the two processes may be found and, if found, why. Therefore, they estimate two models for predicting WOM. First, using a logistic regression model, they determine the whether or not WOM is given. Then, implementing a truncated-at-zero negative binomial distribution model (NBD), they estimated the number of referrals, given that at least one was made.

A similar but slightly more convenient procedure for this class of two-stage models is offered by zero-inflation models, in which the binary and the count model are estimated jointly. Here, we propose using the zero-inflated Poisson model (ZIP; Greene 1994) In the ZIP Model, the Poisson distribution is complemented by a binary model, which is Logit- or Probit-distributed and determines whether or not a referral is made. The standard Poisson model then predicts the number of referrals. Note that this model is theoretically appealing, as it allows for different sets of independent variables predicting the binary and the Poisson model. The specification of the ZIP model applied to WOM referrals is

$$\begin{array}{lcll} y_i & \sim & 0 & \text{with probability } q_i \\ y_i & \sim & \text{Poisson} & \text{with probability } 1-q_i, \end{array}$$

where $y_i$ represents the expected number of referrals made by customer $i$ and $q_i$ denotes the likelihood of zero referrals. $y_i$ is now generated through

$$y_i = z_i y_i^* \tag{3}$$

where $z_i$ represents the (0/1) outcome of the binary model and $y_i^*$ is the number of referrals made conditional on $z_i$=1.

This differentiation between the "whether or not" and the "how many, given yes" process is central to our subsequent argumentation. In line with previous empirical work, customer satisfaction is expected to affect both the likelihood of engaging in WOM (Swan and Oliver 1989; Westbrook 1987) and the conditional number of referrals (Anderson 1998; Bowman and Narayandas 2001). There are indications of a non-linear effect in previous research. Specifically, Anderson shows that the effect of customer satisfaction on positive WOM is stronger at the extreme of the curve. In other words, increases in satisfaction lead to stronger increases in WOM referrals at higher levels of satisfaction. This will have to be taken into account when modeling WOM empirically (see below).

Further, research has also found considerable differences in WOM activity of customers exhibiting equivalent satisfaction levels (e.g., Naylor 1999), suggesting that the relationship between satisfaction and WOM is moderated

by customer-specific characteristics and dispositions. Moderating effects on the satisfaction-WOM link follow.

*Moderating forces of the satisfaction-WOM link*

In previous research, the importance of considering moderating effects of customer satisfaction on loyalty has been underlined (Anderson and Mittal 2000; Mittal and Kamakura 2001). In short, if the relationship between satisfaction and WOM referrals is moderated by customer-specific factors, returns on customer satisfaction in the form of WOM will differ, depending on the targeted customer group, and segments could be identified for which satisfaction increases result in greater WOM referral returns.

Further, once the "referral hurdle" is taken and a customer is generally willing to give positive WOM, the same moderators should act as *direct* influencers on the conditional number of referrals. We therefore expect a direct effect of customer satisfaction and an interaction effect of satisfaction and the customer specific characteristics to affect the likelihood of a referral. Further, the conditional number of referrals (given that at least one referral is made) is expected to be influenced directly (i.e., via main effects) by the same variables.

The literature on interpersonal communication is vast, and various academic disciplines have shown interest in explaining WOM behavior (e.g., social psychology, economics, and sociology). It is not the purpose of this paper to examine the plethora of potential moderator variables that may be addressed in this context. Both academics and managers interested in ROQ/CS models incorporating WOM would favor parsimonious models featuring the key factors influencing WOM behavior. Further, our approach does not incorporate variables which account for differences *across* product categories, such as goods vs. services, or publicly vs. privately consumed goods. Instead, the subsequent discussion concentrates on the effects of different dimensions of a the involvement construct. Involvement has been identified by various theories (e.g., social networks or dissonance theory) as influencing WOM behavior, and empirical studies have confirmed this (e.g., Dichter 1966; Richins and Bloch 1986; Westbrook 1987).

There is agreement in the literature that the involvement concept is multi-dimensional, although there is some controversy about its underlying dimensions. A widely accepted differentiation is between product (or enduring) and situational involvement (Richins and Bloch 1986; Richins and Root-Shaffer 1988). A third category is marketplace involvement or market mavenism (Feick and Price 1987), which has first been suggested to form part of the involvement construct by Kassarjian (1981), who notes that it "is undeniable that independent of the product class, there are some persons that tend to be more involved" (p. 33). Because market mavens have been shown to be more likely than other consumers to engage in communication about product and service offerings, the construct is added here as a third involvement dimension.

*Product involvement* Product involvement refers to the degree to which a person perceives a product to be personally relevant (e.g., Zaichkowsky 1985). Studies show that consumers engage in more information processing as their level of involvement with a product class increases (e.g., Celsi and Olson 1988). In other words, highly involved consumers will search for more information about the respective product class, will be more receptive, and will be more knowledgeable about it. Their greater interest and knowledge leads highly involved consumers to talk more about a product class than other consumer groups. Dichter (1966) even proposes that "product involvement ... produces a tension which is not eased by the use of the product alone, but must be channeled by way of talk, recommendation, and enthusiasm" (p.148). Empirical research has repeatedly confirmed that highly involved customers tend to give more WOM (Dichter 1966; Richins and Bloch 1986; Westbrook 1987) and, as can be expected, its valence depends on the level of customer satisfaction (Sudaraman et al. 1998).

The product involvement concept is typically restricted to consumer settings. However, there is wide agreement in the industrial buying literature that the construct of "product importance" can function as a substitute for product involvement (e.g., Bunn 1993). Product importance is defined as the "buyer's perception of the significance of the buying decision and/or the potential impact of the purchase on the functioning of the firm" (Bunn 1993, p. 43). Similar to product involvement, perceived purchase importance is a significant determinant for the choice process that will be applied in a purchase situation (Richins and Bloch 1991). The main difference between the two concepts is that product involvement refers to the personal interest of the decision maker, while the importance of a purchase as perceived by an industrial decision maker is mainly triggered by the corporation's interest (Bunn 1993). The relationship between industrial product importance and the dissemination of WOM has not been tested empirically to date, but a positive relationship between the two constructs can be argued on the same grounds as the relationship between product involvement and WOM in a consumer setting. Industrial purchasers who feel that a particular buying decision is very important to them will feel an urge to promote their decisions publicly, in order to reduce dissonance and present themselves to others in a positive light. Because high perceived importance leads to more intense information search, it can be expected that other industrial buyers often recognize such customers as being knowledgeable and ask them for information. Hence, we

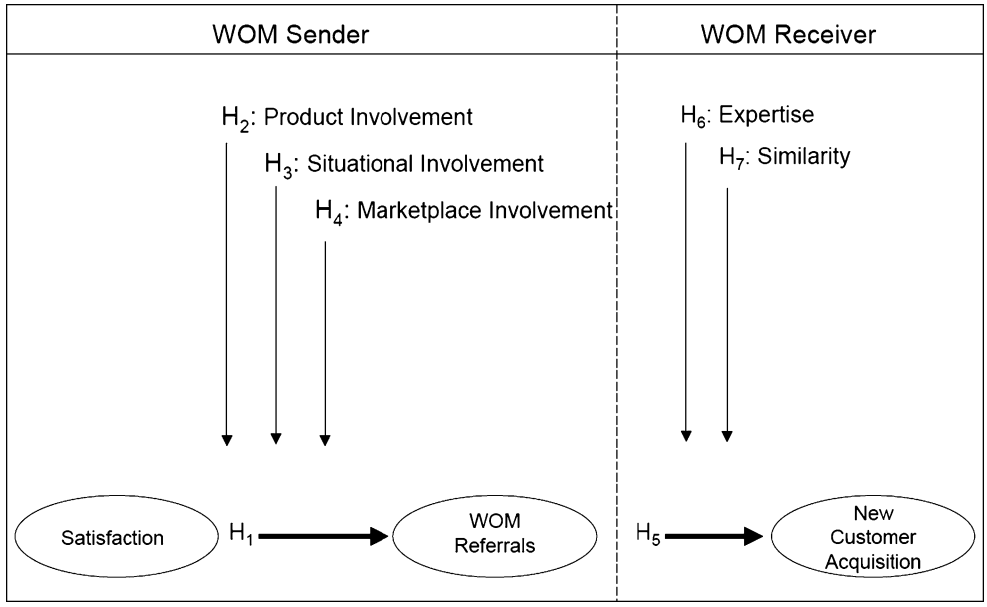


**Figure 1** Hypothesized relationships for the empirical study.

propose that purchase importance replaces product involvement in business-to-business relationships.[1]

*Situational involvement* Involvement can also be created by situational factors (Richins and Bloch 1986), such as a recent purchase decision. In contrast to product involvement, situational involvement wanes after the purchase (Houston and Rothschild 1978). However, as Richins and Bloch (1986) suggest, situational involvement is maintained for at least some time after a purchase decision because of the newness of the chosen product, or because of cognitive dissonance. Both newness and cognitive dissonance have been shown to be determinants of WOM behavior (East et al. 2001; Hunt 1970). Also, situational involvement itself has been found to result in a higher likelihood of WOM transmission (Richins and Bloch 1986; Richins and Root-Shaffer 1988). This is indirectly supported by East et al. (2001) who find that in the first year after a new service provider has been chosen, WOM activity is highest. We therefore add situational involvement as a further explanatory variable to our model.

*Marketplace involvement* Several authors have noted that some consumers are, in general, more likely than others to possess product information and transmit it to third parties, independent of their enduring or transitory product involvement (Kassarjian 1981). This aspect has been proposed as a third dimension of the involvement construct (Kassarjian 1981; Slama and Tashchian 1985). In a seminal study, Feick and Price (1987) identify a customer type called market maven. The existence of market mavens and their higher propensity to give WOM about different products and services has been repeatedly confirmed (Schneider and Rodgers 1993; Slama and Williams 1990), and has been extended to international settings (Abratt et al. 1995) and to a business-to-business context (Nataraajan and Angur 1997). Because the differentiation between market mavens and non-mavens is gradual rather than dichotomous, we choose the term "marketplace involvement" (Slama and Tashchian 1985) as an indicator of the individual degree of "mavenism" of a customer (Price et al. 1995). Marketplace involvement is, therefore, added as a further determinant of WOM. The following hypotheses summarize the above discussion (see also Fig. 1):

$H_{1a}$: Customer satisfaction exhibits a positive effect on both the likelihood and the conditional number of WOM referrals.

$H_{1b}$: The effect of customer satisfaction on both the likelihood and the conditional number of WOM referrals increases as customer satisfaction increases.

$H_{2a}$: The positive effect of customer satisfaction on the likelihood of a WOM referral is positively moderated by product involvement. Specifically, the link between satisfaction and likelihood of WOM referrals is stronger for high product involvement customers than for low product involvement customers.

$H_{2b}$: Product involvement exhibits a positive effect on the conditional number of WOM referrals given by a customer.

[1] As one reviewer correctly noted, it is possible for industrial decision makers to have product involvement if the purchase is related to their jobs. The industrial buying literature has so far neglected this issue. For the present context, it seems unlikely that the decision between utility providers has a strong effect on people's careers.

$H_{3a}$: The positive effect of customer satisfaction on the likelihood of a WOM referral is positively moderated by situational involvement. Specifically, the link between satisfaction and likelihood of WOM referrals is stronger for high situationally involved customers than for low situational involvement customers.

$H_{3b}$: Situational involvement exhibits a positive effect on the conditional number of WOM referrals given by a customer.

$H_{4a}$: The positive effect of customer satisfaction on the likelihood of a WOM referral is positively moderated by marketplace involvement. Specifically, the link between satisfaction and likelihood of WOM referrals is stronger for high marketplace involvement customers than for low marketplace involvement customers.

$H_{4b}$: Marketplace involvement exhibits a positive effect on the conditional number of WOM referrals given by a customer.

## Modeling the WOM-customer acquisition link

The importance of WOM for acquiring new customers has been pointed out in the interpersonal influence literature (e.g., Bansal and Voyer 2000; Engel et al. 1969), as well as in the diffusion of innovations (Rogers 1995) literature. However, little explicit thought has been given to how, precisely, WOM affects customer decision making. In consumer behavior research, it is typically assumed that WOM works through attitude change; i.e., experimental studies show that referrals positively affect consumer attitudes of goods and services (e.g., Bone 1995; Herr et al. 1991), which in turn increases the likelihood of the recommended goods being selected. Following these results, we propose that the reception of a WOM referral increases the likelihood of selecting the respective product or service. Further, based on research on interpersonal communication, we expect the importance of WOM to differ across WOM sender and receiver dyads within the same product category. Hence, another two-step process is to be defined for the effect of WOM on customer acquisition. The first question is whether WOM referrals exhibit an effect on product choice at all, i.e., $\text{Prob}(\text{Purchase}) = f(\text{WOM}_{\text{received}})$. In a second step, it is of interest whether the characteristics of the WOM referral source discussed below (expertise and similarity) affect the probability that received WOM results in a purchase, i.e., $\text{Prob}(\text{Purchase} \mid \text{WOM}_{\text{received}} = 1) = f(\text{Exp}, \text{Sim})$. This way of modeling WOM effects is consistent with the notion that, rather than entirely or not at all determining purchase decisions, a referral will typically contribute only partially to the acquisition of a new customer. However, observed is only the discrete outcome (purchase vs. non-purchase), and the effect of the referral must be estimated.

Conformity and interpersonal influence research (Bone 1995; Gilly et al. 1998) identify perceived source expertise and similarity as the main characteristics that affect the effectiveness of interpersonal communications. Those are discussed below in more detail.

### *Source expertise*

Expertise of the information source can be defined as the "ability to perform product-related tasks successfully" (Feick and Higie 1992, p.12). Expertise has often been found to affect the influence of a piece of information (e.g., Herr et al. 1991; Yale and Gilly 1995).

It seems obvious that information obtained from an expert source should be especially influential. Gilly et al. (1998) argue that someone who is an expert in a particular product category should possess more product- or purchase-related information in this field, and therefore his or her opinion will be sought more often than the opinion of others. Furthermore, the greater knowledge base of experts should enable them to more effectively convince others of their opinions on products and brands. Empirical studies show that experts are more often opinion leaders in a product category than are others (Jacoby and Hoyer 1981). Their decisions are often copied, because opinion leaders decisions' are perceived to be of higher quality (Gilly et al. 1998). Empirical evidence for the greater influence of expert sources on the receiver is widely available (e.g., Bone 1995; Herr et al. 1991; Feick and Higie 1992). Hence, we expect that source expertise should be positively related to the influence of WOM.

### *Source similarity*

Source similarity or homophily refers to the degree to which individuals are similar in terms of certain attributes (Brown and Reingen 1987). Several theories explain why perceived sender similarity should increase the influence of the information transmitted. First, the source-attractiveness model suggests that receivers can better identify with sources that are similar to themselves (Kelman 1961). According to Festinger's (1954) theory of social comparison, an individual's tendency to compare herself or himself with another person increases with the degree of similarity between the two, because individuals implicitly assume that similar people have similar needs and preferences. Finally, the match-up hypothesis (Kamins 1990) suggests that informational influence depends on the consistency of the communicator's image with the image of the product and the self-concept of the receiver of the information.

Empirical studies about the effect of source similarity on informational influence have primarily been conducted in advertising research. These studies consistently support the hypothesis that similar communicators are perceived as being more influential than dissimilar ones (e.g., Feick and Higie 1992). In the context of WOM, three studies (Brown and Reingen 1987; Gilly et al. 1998; Yale and Gilly 1995) confirm that the effect of WOM on the receiver is increased when it comes from similar, as compared to dissimilar, informants. Hence, our discussion of the WOM-acquisition link can be summarized as follows (see also Fig. 2):

$H_5$: Having received positive WOM for a particular provider increases the likelihood of choosing this provider.

$H_6$: The likelihood of choosing a provider for which one has received positive WOM increases with perceived sender expertise.

$H_7$: The likelihood of choosing a provider for which one has received positive WOM increases with perceived sender similarity.

## Two empirical studies

We conducted two empirical studies in the German energy market, one in a business-to-consumer setting and one in a business-to-business setting to test our hypotheses and to show how the WOM extension of the ROQ/CS models can be applied empirically. For a number of reasons, the German energy market is well suited for this kind of study. First, due to its recent liberalization (in 1999; previously, more than 200 energy providers had been granted regional monopolies), general interest in the topic, and therefore the participation rate in the study, were expected to be relatively high, and, more importantly, WOM effects on switching decisions after the liberalization were easily observable. Second, the contractual setting of the service enabled us to clearly observe adoption behavior due to WOM. Third, in the initial phase after the market liberalization, many companies engaged in strong brand building and customer acquisition activities, leading to an active market environment which, significantly raised consumer interest. It was therefore expected that for this typically low-involvement product, varying levels of involvement could be observed. Lastly, an exploratory mall-intercept study in a metropolitan German city revealed that more than one out of five customers who switched did so at last partially due to WOM, suggesting that WOM is indeed an important factor for switching in this industry.


**Figure 2** Difference in the relationship between customer satisfaction and the number of referrals for high and low product involvement.

### Research design

In the consumer study, two random samples of the same size were drawn from two populations within the customer base of a major (top three) European energy provider, one representing the group of "switchers" (i.e., newly acquired customers who have chosen this provider after the deregulation), and the other consisting only of "stayers" (i.e., customers who had already been with the provider before the market was liberalized). Professional interviewers from a market research company conducted computer-assisted telephone interviews (CATI) with 400 customers of each group. To reach this number, 2,638 calls (to 892 switchers and 1,746 stayers) were necessary. Of these, 737 calls repeatedly reached a busy signal or the call was not answered. Refusals totaled 1,101, resulting in a response rate of 42.1% (800/1,901). Due to missing values or contradictory answers, 112 cases had to be removed, so that 688 data sets were analyzed.

In the business-to-business study, the sample was randomly drawn from a German company database ("Hoppenstedt"). Telephone interviewers made calls to 5,724 companies. Of these, 3,131 calls resulted in either no answer or a busy signal and 2,168 potential respondents refused to participate in the study. Four hundred twenty-five interviews were completed, resulting in a response rate of 16.4% (425/2,593). Because of missing values, nine cases were eliminated from the data set, resulting in 416 usable questionnaires.

The reasons for using two different sampling procedures were the following: in the consumer study, we analyze a sample of the customer base of one provider, which is not uncommon for ROC/CS studies (Kamakura et al. 2002). Further, the sampling design in the consumer study ensures that, though the relative number of switchers in the marketplace was rather low at the time of the study (until then, 5% of all customers had switched their provider), enough switchers were asked to determine switching probabilities due to WOM. This restriction was not present in industrial markets, where switching rates were substantially higher (approximately 20% of all industrial users had

switched their provider at that time). Hence, the random sample in the business-to-business study allows for a valid estimation of the true rate of switchers due to WOM. However, this value could be potentially biased in the consumer sample, because the "switched-to" provider is the same for all switchers, but not the "switched-from." In the business-to-business study, the "switched-from" and "switched-to" providers are different for all switchers, allowing for the computation of a general "market-wide" conversion rate. In both the consumer and the industrial sample, a comparison of the profiles of respondents with non-respondents with regard to demographics, firm size, and firm turnover revealed no statistically significant differences.

## Measurement of constructs

For all our latent variables, various measurement instruments are available in the marketing literature. Because none of the scales had been tested in the current context (i.e., energy provision in Germany), we first composed scales for each construct that included items from a number of studies (if available) rather than from one single study. The composed scales were pre-tested in a small-sample study, and revised on the basis of its results. Items from the composed scales were deleted until a) exploratory factor analysis resulted in a satisfactory one-factor solution (i.e. average explained variance >0.5 and only one factor extracted); b) confirmatory factor analysis resulted in a satisfactory one-factor solution (i.e., allowing a second factor did not result in significantly better fit); and c) coefficient alpha was satisfactory. If not indicated differently, six-point rating scales were used for item measurement.

Independent variables expected to exert an influence on the likelihood and the number of WOM referrals are satisfaction, product involvement (consumer study), purchase importance (industrial study), situational involvement, and marketplace involvement. A summary of the results of exploratory and confirmatory factor analysis can be seen in Tables 1 and 2, and shows that the constructs are well captured by the instruments used.

Customer satisfaction has been conceptualized and measured repeatedly in earlier work (e.g., Anderson et al.

**Table 1** Latent variable measures for the consumer study

| Item[a] | | Item-to-total | Av. expl. Variance | Cronbach alpha | Item reliability | Composite reliability |
|---|---|---|---|---|---|---|
| Sat | I am fully satisfied with my current provider. | 0.57 | | | 0.53 | |
| Sat | The relationship with my provider is very good. | 0.63 | | | 0.69 | |
| Sat | My provider fulfils my expectation. | 0.55 | | | 0.76 | |
| Sat | Overall, I am very satisfied with the service I get from my current provider. | 0.73 | 0.63 | 0.80 | 0.81 | 0.87 |
| Inv | I am very interested in electricity and providers. | 0.43 | | | 0.49 | |
| Inv | I know a lot about electricity production and different providers. | 0.42 | | | 0.53 | |
| Inv | It is very interesting to get an overview of the many electricity producers in the market. | 0.48 | | | 0.55 | |
| Inv | Sometimes I talk about electricity and providers with other people. | 0.46 | | | 0.49 | |
| Inv | I have seen many advertising campaigns for electricity providers. | 0.52 | | | 0.71 | |
| Inv | I read reports in magazines and newspapers about electricity providers. | 0.53 | 0.49 | 0.74 | 0.77 | 0.82 |
| Mav | I like introducing new brands and products to my friends. | 0.69 | | | 0.83 | |
| Mav | I like helping people by providing them with information about many kinds of products. | 0.71 | | | 0.58 | |
| Mav | People ask me for information about products, places to shop, or sales. | 0.64 | | | 0.61 | |
| Mav | If someone asked where to get the best buy on several types of products, I could tell him or her where to shop. | 0.63 | | | 0.77 | |
| Mav | My friends think of me as a good source of information when it comes to new products or sales. | 0.72 | 0.64 | 0.86 | 0.78 | 0.93 |
| Exp | The source has good knowledge about energy and the energy market. | 0.72 | | | | |
| Exp | The source is an expert in the area of energy providers. | 0.72 | 0.86 | 0.84 | n.a. | n.a. |
| Sim | The source is similar to me in preferences and values. | 0.61 | | | n.a. | |
| Sim | Overall, the source is a person who is similar to myself. | 0.61 | 0.80 | 0.76 | n.a. | n.a. |

For measurement scales that have fewer than three items, meaningful confirmatory factor analysis results cannot be computed.
[a] Sat = Satisfaction; Inv = Involvement; Mav = Marketplace Involvement; Exp = Expertise; Sim = Similarity

**Table 2** Latent variable measures for the business-to-business study

| Item[a] | | Item-to-total | Av. expl. Variance | Cronbach alpha | Item reliability | Composite reliability |
|---|---|---|---|---|---|---|
| Sat | We are fully satisfied with our current provider. | 0.75 | | | 0.93 | |
| Sat | The relationship between our provider and us is very good. | 0.59 | | | 0.81 | |
| Sat | Our provider couldn't do any better. | 0.66 | | | 0.72 | |
| Sat | Our provider fulfils our expectation. | 0.75 | | | 0.74 | |
| Sat | Overall, we are very satisfied with the service we get from our current provider. | 0.55 | 0.63 | 0.85 | 0.88 | 0.91 |
| Imp | The choice of the right energy provider is an important decision for our business. | 0.60 | | | n.a.[b] | |
| Imp | We take the decision of choosing an energy provider seriously. | 0.60 | 0.80 | 0.75 | n.a. | n.a. |
| Mav | I like introducing new brands and products to my friends. | 0.60 | | | 0.61 | |
| Mav | I like helping people by providing them with information about many kinds of products. | 0.64 | | | 0.54 | |
| Mav | People ask me for information about products, places to shop, or sales. | 0.65 | | | 0.71 | |
| Mav | If someone asked where to get the best buy on several types of products, I could tell him or her where to shop. | 0.60 | | | 0.69 | |
| Mav | My friends think of me as a good source of information when it comes to new products or sales. | 0.60 | 0.58 | 0.82 | 0.81 | 0.89 |
| Exp | The source has good knowledge about energy and the energy market. | 0.89 | | | n.a. | |
| Exp | The source is an expert in the area of energy providers. | 0.89 | 0.94 | 0.94 | n.a. | n.a. |
| Sim | The source is similar to me in preferences and values. | 0.73 | | | n.a. | |
| Sim | Overall, the source is a person who is similar to myself. | 0.73 | 0.87 | 0.84 | n.a. | n.a. |

[a] Sat = Satisfaction; Imp = Purchase Importance; Mav = Marketplace Involvement; Exp = Expertise; Sim = Similarity
[b] For measurement scales that have fewer than three items, meaningful confirmatory factor analysis results cannot be computed.

1994; Fornell et al. 1996; Rust and Zahorik 1993). Results of the pretest suggested that the satisfaction construct in the consumer study was well captured by the displayed four-item instrument. In the business-to-business study, a similar, pre-tested five-item measure was employed (based on items generated from Cannon and Perreault 1999; Homburg and Rudolph 2001). Both exploratory and confirmatory factor analysis for assessing reliability and validity of our measures led to satisfactory results for the two instruments. Product involvement has also been researched and operationalized in many studies (e.g., Richins and Bloch 1991; Zaichkowsky 1985). The final instrument, purified after the pretest, contained six items derived from the studies of Richins and Bloch (1991) and Zaichkowsky (1985). The instrument performed well on all tests for assessing measurement quality.

For measuring purchase importance, items used by Bunn (1993) were modified towards the purpose of our study. Results of the pre-test indicated that a two-item instrument effectively captured the construct well. In the business-to-business study, the items used (Table 2), showed good reliability and validity. Marketplace involvement was measured using the market maven scales developed by Feick and Price (1987) for the consumer, and by Nataraajan and Angur (1997) for the business-to-business area. From both scales, one item had to be removed after the pretest due to low item-to-total correlation. In the main studies, both instruments showed good results.

**Table 3** Descriptive statistics and correlation matrix for independent variables in the consumer study

| | Satisfaction | Product involvement | Marketplace involvement | Expertise | Similarity |
|---|---|---|---|---|---|
| Satisfaction | 18.89 (5.08) | | | | |
| Product involvement | −0.01 | 19.74 (6.02) | | | |
| Marketplace involvement | 0.05 | 0.41* | 16.18 (6.18) | | |
| (Exchange partner's) Expertise | 0.20* | 0.17* | 0.13* | 8.62 (2.70) | |
| (Exchange partner's) Similarity | 0.11 | 0.15* | 0.23* | 0.17* | 7.85 (2.75) |

Correlation coefficients are given in the non-diagonal elements. Means and standard deviations (in parentheses) are given in the diagonal elements
*$p<0.05$

**Table 4** Descriptive statistics and correlation matrix for independent variables in the business-to-business study

| | Satisfaction | Purchase importance | Marketplace involvement | Expertise | Similarity |
|---|---|---|---|---|---|
| Satisfaction | 22.42 (6.71) | | | | |
| Purchase importance | 0.12* | 8.18 (2.62) | | | |
| Marketplace involvement | 0.07 | 0.25* | 16.90 (5.81) | | |
| (Exchange partner's) Expertise | 0.06 | 0.19* | 0.08* | 8.82 (2.81) | |
| (Exchange partner's) Similarity | −0.10 | 0.12 | 0.04* | −0.0 | 5.61 (2.85) |

Correlation coefficients are given in the non-diagonal elements. Means and standard deviations (in parentheses) are given in the diagonal elements.
*$p<0.05$

While various sources of situational involvement may exist, we measured this construct in accordance with Richins and Bloch (1986) and Richins and Root-Shaffer (1988) using a dummy-variable that indicated whether the respondent had recently made a purchase decision or not (i.e., had switched his or her energy provider). In the consumer study, this information was given by our research design: all switchers were categorized as being high in situational involvement, while stayers were coded as low. In the industrial setting, we asked respondents whether or not they had switched their provider recently (after the market liberalization). Again, those who had done so were grouped as being high in situational involvement.

Expertise and similarity are assumed to influence the effectiveness of WOM referrals for both the consumer and the industrial sample. Logically, only customers who had received a recommendation to switch their provider could be interviewed about communicator characteristics. Hence, we first asked respondents to indicate whether they had received a recommendation to switch their provider within the last year, regardless of their subsequent switching behavior. Two hundred seventy-one respondents in the consumer study and 157 industrial energy users responded with "yes" and were further interviewed about expertise and similarity of the informant. Two item-instruments, both generated from the study of Price et al. (1989), were used to measure those constructs. Table 3 shows the basic descriptive statistics for the constructs used in the consumer study that are assumed to affect either the number of WOM referrals made or the conversion rate. For the business-to-business study, the same information is given in Table 4.

The first dependent variable in our studies is number of WOM referrals. For measuring the number of WOM referrals, we asked respondents to indicate whether they had given positive WOM about their current provider within the last year and, if so, how many times. Previous research in this area (Anderson 1998; Bowman and Narayandas 2001) has also relied on self-report measures of WOM dissemination, and found consistent and stable results. However, the possibility of response bias must be taken into account. Both WOM referral omission (i.e., forgetting) and misplacement (i.e., telescoping error) may occur in memory (Morwitz 1997b). The two-step procedure described above (first asking whether or not, and in a next step asking how many referrals have been given) has been shown to lead to more accurate results when asking frequency questions in surveys (Brennan and Chan 1996). Also, research results suggest that an open-ended question for frequency leads increases response accuracy (Burton and Blair 1991). Because values larger than four were relatively rare, we coded all values between five and nine as "8," and values greater than nine as "12," which were approximately the weighted means of the respective categories. This is a common procedure when analyzing count data, which has been shown to help stabilizing estimation without distorting parameter estimates (Greene 2003). Further, it can also be expected to reduce potential response bias, since individuals who gave no or a low number of referrals can be expected to recall WOM frequency more accurately than respondents that gave a large number of referrals (Burton and Blair 1991). In Table 5, we display the observed values for the count variables "number of WOM referrals given."

The second dependent variable is the effect of WOM on provider switching. In a deregulated market such as energy provision, where there are very few new customers, this

**Table 5** Frequencies for WOM referrals in the consumer and in the B2B sample

| | | 0 | 1 | 2 | 3 | 4 | 8 | 12 |
|---|---|---|---|---|---|---|---|---|
| Consumer study (B to C; $n$=688) | $n$ | 434 | 21 | 54 | 78 | 58 | 34 | 9 |
| | % | 63.1 | 3.1 | 7.9 | 11.3 | 8.4 | 4.9 | 1.3 |
| Business-to-business-study (B to B; $n$= 416) | $n$ | 292 | 10 | 21 | 21 | 11 | 26 | 36 |
| | % | 70.1 | 2.4 | 4.9 | 4.9 | 2.6 | 6.4 | 8.7 |

**Table 6** Results of zero-inflated Poisson models for number of WOM referrals in the consumer and in the business-to-business sample (standard errors in parentheses)

| | Consumer study | | Business-to-business study | |
|---|---|---|---|---|
| | Logit splitting model | Poisson model | Logit splitting model | Poisson model |
| Main effects | | | | |
| Customer satisfaction | 0.0316 (0.0100)** | 0.1573 (0.0201)* | 0.0257 (0.0859)* | 0.0074 (0.046) |
| Customer satisfaction$^2$ | 0.0304 (0.0098)** | 0.0159 (0.0019)* | 0.0084 (0.0038)* | 0.0061 (0.0014)** |
| Product involvement | 0.0010 (0.0010) | 0.0010 (0.0003)** | – | – |
| Purchase importance | – | – | −0.0006 (0.0034) | −0.3889 (0.366) |
| Situational involvement | 0.2721 (0.1229)** | 0.2095 (0.0330)* | 0.7935 (0.3722)** | 1.718 (0.6771)** |
| Marketplace involvement | 0.0005 (0.0009) | 0.0008 (0.0005)*** | −0.0001 (0.0011) | 0.0589 (0.0183)* |
| Interaction effects | | | | |
| Customer satisfaction* | 0.0051 (0.0024)** | 0.0001 (0.0001) | – | – |
| Product involvement | | | | |
| Customer satisfaction* | – | – | 0.0081 (0.0029)* | 0.0001 (0.0001) |
| Purchase importance | | | | |
| Customer satisfaction* | 0.0021 (0.0009)** | 0.0049 (0.0002)* | 0.138 (0.0818)*** | 0.0692 (0.03294)** |
| Situational involvement | | | | |
| Customer satisfaction* | 0.0043 (0.0022)** | −.0000 (.0004) | 0.0001 (0.0014) | −0.0014 (0.0034) |
| Marketplace involvement | | | | |
| Log-likelihood | −722.13 | | −380.19 | |

*Statistically significant at the 0.1 level
**Statistically significant at the 0.05 level
***Statistically significant at the 0.01 level

means that the dependent variable can be interpreted as *switching due to WOM*.[2] But switching due to WOM cannot, as explained, be directly observed. However, switching (or staying) is known for all customers, since this information can be taken from the customer database. Also, reception of a switching referral (or not) was included in the survey.

## Data analysis and results

### WOM referrals

For testing the derived hypotheses regarding the determinants of WOM, the ZIP model described above was parameterized using the hypothesized independent variables of satisfaction and product, marketplace, and situational involvement. Because of the two-step nature of the ZIP model, independent variables must be specified for both the binary (whether or not WOM is given) and the Poisson (conditional number of WOM referrals) model. Note that this model type is very convenient for testing our hypotheses, as it allows for different sets of independent variables predicting the binary and the Poisson model. In accordance with our hypotheses, independent variables for the binary model (i.e., whether or not WOM is given) are customer satisfaction, squared customer satisfaction in the positively defined area (to capture potential non-linear effect), and an interaction of customer satisfaction, and the three involvement types. Independent variables for the model (how many referrals are given) are main effects of customer satisfaction, squared customer satisfaction and the three involvement types. To further test the model for non-expected effects, we also added main effects of all variables to the binary, and interaction effects to the Poisson model, in a next step. The ZIP model and a test against competing models is described in some more detail in the Appendix.

Table 6 provides an overview of the parameter estimates, standard errors, and significance level for the two ZIP models (consumer and business-to-business study) with logit splitting in the binary model. It can be seen that in the two models, both the linear and the quadratic effect of customer satisfaction in the binary model is in the expected direction and is statistically significant. Further, the effects of satisfaction on the conditional number of referrals are all positive and statistically significant with the exception of the

[2] We acknowledge the possibility that consumers or businesses are not switchers but are new to the market because of, for example, moving away from the parents' home or establishing a start-up business. But this would have been revealed by their answers to the questions on their switching from their previous provider, and no such case occurred in our analysis. In any case, the proportion of such "new to the market" customers is extremely low because energy is a service everybody needs.

**Table 7** LOGIT-regressions

$\text{Prob}(\text{Switch} = 1) = \frac{e^{\delta \cdot \text{WOM}_{\text{received}}}}{1+e^{\delta \cdot \text{WOM}_{\text{received}}}}$

| | B (Std. error) | *t*-value |
|---|---|---|
| Weighted LOGIT-regression models for the consumer study | | |
| WOM received | 0.568 (0.287) | 1.98** |
| Constant | −3.117 (0.259) | 12.03** |
| $\text{Prob}(\text{Switch} = 1 \mid \text{WOM}_{\text{received}} = 1) = \frac{e^{\delta \cdot CC}}{1+e^{\delta \cdot CC}}$ | | |
| Expertise | 0.179 (0.014) | 12.35** |
| Similarity | 0.084 (0.028) | 3.03** |
| Constant | 4.83 (0.332) | 14.51** |
| LOGIT-regression for the business-to-business study | | |
| WOM received | 0.874 (0.242) | 3.60** |
| Constant | −1.789 (0.422) | 4.23** |
| $\text{Prob}(\text{Switch} = 1 \mid \text{WOM}_{\text{received}} = 1) = \frac{e^{\delta \cdot CC}}{1+e^{\delta \cdot CC}}$ | | |
| Expertise | 0.062 (0.344) | 0.18 |
| Similarity | 0.516 (027) | 19.58** |
| Constant | 6.592 (0.383) | 17.21** |

**Statistically significant at the 0.05 level

linear effect in the business-to-business case. Overall, this suggests that $H_1$ is confirmed, i.e., customer satisfaction indeed exhibits positive influence on customer WOM. As can be seen from the coefficient for satisfaction-squared, the effect becomes stronger as customer satisfaction increases.

$H_{2a}$ also receives support, as the interactions between customer satisfaction and product involvement (consumer) and between customer satisfaction and purchase importance (business), are positive and statistically significant. The main effect on the conditional number of referrals is, however, only statistically significant for product involvement (consumer). Hence, $H_{2b}$ is only partially supported. $H_{3a}$ and $H_{3b}$ receive full support. In both studies, the interaction between customer satisfaction and situational involvement significantly affects the binary outcome, and the main effect of situational involvement affects the conditional number of referrals. Finally, $H_{4a}$ is partially supported and $H_{4b}$ is fully supported, as the interaction effect between satisfaction and marketplace involvement is only statistically significant for the consumer study, but the main effect of marketplace involvement exhibits statistically significant influence on the conditional number of referrals.

To illustrate the importance of the moderating variables, Fig. 2 shows the relationship between customer satisfaction and the expected number of positive referrals in the consumer study. Customers are divided into a low and a high product involvement group. It can be seen that the marginal effect of increased customer satisfaction on referral making also depends on other independent variables. Highly involved customers are not only more likely to give WOM, but at virtually all points of the curve, an increase in customer satisfaction of highly involved customers results in a higher increase in referral making than is true for lesser involved customers.

Adding the non-hypothesized main effects of the involvement variables to the binary model and the interactions between satisfaction and the involvement variables to the conditional count model yields an unexpected but consistent (across the two studies) result: in both models, the main effect of situational involvement is positive and statistically significant in the binary model, and the interaction between customer satisfaction and situational involvement is positive and statistically significant in the conditional count model. Hence, a recent switch leads to the dissemination of positive WOM, regardless of the level of customer satisfaction. This can be explained by the fact that cognitive dissonance reduction strategies start even before satisfaction judgments are properly formed and, therefore, new customers try to communicate the "goodness" of their choice to others, either to convince themselves or to prevent others from disregarding their ability to make good choices (Dichter 1966). This suggests that customers can be especially valuable for companies in the first year, which is contradictory to the widely used CLV conceptualization by Reichheld and Sasser (1990), in which profits from referrals are expected to increase over time. Further, the additional significant interaction effect with satisfaction suggests that when satisfaction is high, new customers are disproportionally more likely to communicate to others their pleasure or relief about the recent purchase.

## Conversion rate

We now turn to the estimation of the conversion rate and its determinants. As described above, two questions are of interest regarding the second dependent variable (i.e., the conversion rate of WOM referrals). First, do WOM referrals exhibit a statistically significant effect on switching, and second, do expertise and similarity affect the probability that WOM results in switching? Because expertise and similarity are only observed for a subset of all customers (i.e., those who did receive a switching referral), the analysis has to be accomplished in two steps. We start by analyzing whether the reception of a switching referral increases the likelihood of switching behavior.

As discussed above, the dependent variable Prob(Purchase) cannot be directly observed. The discrete event of switching is modeled as the empirical manifestation of Prob (Purchase) in a binary logistic regression model contingent on the reception of a referral, i.e.,

$$\text{Prob}(\text{Switch} = 1) = \frac{e^{\gamma \cdot \text{WOM}_{\text{received}}}}{1 + e^{\gamma \cdot \text{WOM}_{\text{received}}}} \quad (4)$$

In the second step, given that a referral has been received ($WOM_{received}=1$), switching is modeled as contingent on communicator characteristics (*CC*; expertise and similarity). This formulation is equivalent to a logit model with sample selection (e.g., Greene 2003).

$$\text{Prob}(\text{Switch}=1|\text{WOM}_{\text{received}}=1)=\frac{e^{\delta\cdot CC}}{1+e^{\delta\cdot CC}} \quad (5)$$

Before fitting the model into the context of the consumer study, we have to adjust for the fact that only 5% of all customers in the market were switchers, while the sample contains 50% stayers and 50% switchers. Following the procedure suggested by Manski and McFadden (1981), we added randomly drawn (with replacement) "stayer" observations until the proportion of stayers matched this groups' representation in the customer database (i.e., 95%). For the resulting sample, a logit model for the effect of WOM on switching Eq. 4 was estimated. Subsequently, the logit model with sample selection (5) correction was estimated to understand the effect of similarity and expertise on the effectiveness of a referral (5).

For the industrial study, no adjustment was necessary, as the sample was drawn randomly, and thus the distribution of switchers and stayers approximated the market structure. In Table 7, the results of the four logit models are reported.

The effect of WOM ($H_5$) on switching can be obtained by subtracting the switching probability from a customer who has *not* received WOM (i.e., the logit model with only a constant) from the switching probability of a customer who *has* received WOM (i.e., the logit model where $WOM_{received}=1$). The resulting switching probabilities in the consumer sample are 7.2% if WOM was received and 4.2% if not, which means that the reception of a switching referral increases the likelihood of switching by 3 percentage points. For the industrial sample, the resulting probabilities are 28.6 and 14.4%, suggesting that the marginal effect of WOM on switching is stronger in the industrial than in the consumer setting (14.2 versus 3.0 percentage points). That WOM should be more important in industrial than in consumer markets has been proposed in the literature (e.g., Money et al. 1998), but not been validated to date.

From Table 7, it can further be seen that when a switching recommendation is received, expertise and similarity of the sender exhibit a statistically significant effect on the likelihood of switching. An interesting difference between the consumer and the industrial study is in the effects of the two independent constructs: while the influence of expertise ($H_6$) of the referral source on switching exceeds the effect of similarity ($H_7$) for the consumer sample, expertise is not a significant predictor for the outcome of the switching decision in the business-to-business study. Hence, industrial buyers tend to rely on referrals from similar people. This finding could perhaps be explained by the fact that industrial buyers perceive choosing between energy providers as more complex and individualized. While individual consumers tend to view energy as a straightforward product with few attributes to evaluate, businesses often rely on additional services offered by energy providers such as consulting or development of energy concepts for new building. The individual need of a firm may be perceived as so complex and atypical that even outside experts do not possess the knowledge relevant for making purchase decisions. Another explanation could be that when it comes to making business decisions, a personal relationship holds higher value because an outside expert does not have an incentive to give correct information (and, in fact, an expert may even benefit from acting opportunistically).[3]

### *Integrating WOM into ROQ/CS models*

Before discussion the implications of our study, we demonstrate, through simulation how the results from the present study can help managers compute the return on satisfaction through WOM. We briefly illustrate, using our data, the potential effects of increased customer satisfaction on customer acquisition through WOM.

Following from Eq. 2, an increase in WOM depends on an increase in customer satisfaction, $\Delta WOM=f(\Delta SAT)$. To quantify this effect, we need to compute the partial derivatives of the parameters for customer satisfaction in the ZIP model. In other words, we simulate that all other included variables are kept constant at their mean and satisfaction is increased by one unit from its mean. The resulting value represents the expected increase in referral

[3] Because we treat the effect of WOM on switching as unobserved, it seems important to verify its effect using self-reports from the customers. Therefore, all switchers who had received a referral before switching were asked whether this referral had been their primary motivation to switch. Further, we asked all referral receivers (both switchers and non-switchers) how influential they had perceived the WOM referral to be (using five items from the "perceived influence" scale by Bansal and Voyer 2000). Results showed that switchers perceived the referral to be more influential than non-switchers (25.14 vs. 20.34, $F=64.23$, $p<0.001$ for the consumer and 25.28 vs. 19.09, $F=29.41$, $p<0.001$ for the industrial sample), suggesting that receiving a referral perceived as influential increases the likelihood to switch. Among the switchers, those who had said the referral was the primary switching motivation perceived it to be more influential than those who said the referral was not the primary switching motivation (consumer: 26.33 vs. 23.33, $F=17.33$, $p<0.001$; industrial: 27.00 vs. 23.31, $F=4.78$, $p<0.05$), suggesting varying influence of WOM on the switchers. Further, perceived importance of the referral is positively and significantly correlated with the proposed determinants of WOM effectiveness, i.e., expertise (consumer: $r=.49$, $p<0.01$; industrial $r=0.23$, $p<0.01$) and similarity (consumer: $r=0.38$; $p<0.01$; industrial: $r=0.48$, $p<0.01$), which confirms the direction and pattern of the results of the binary analysis.

making if customer satisfaction is increased by one unit and all other variables remain the same. Computation of derivatives for the ZIP model is straightforward and described in, for example, Greene (1994). The resulting value for satisfaction in the consumer study is 0.09, suggesting that an increase of the satisfaction scale by one unit (i.e., increasing the four customer satisfaction items by one unit each) increases the number of referrals by 0.09. Because previous research has typically worked with six-point one-item scales for measuring satisfaction, we multiply our results for the scale ranging from 4 to 24 by four, in order to obtain comparable results. Hence, a one-point increase of overall satisfaction increases WOM referrals by $4 \cdot 0.09 = 0.36$ referrals.

Next, the incremental number of new customers is contingent on WOM referrals times the conversion rate. As noted above, the increase in switching conversion rate when WOM is the probability of switching given that WOM was received (0.073), minus the probability of switching given WOM was not received (0.043), which is 0.03. Hence,

$$\Delta NC = \Delta WOM^{*}\Delta Prob(Switch)_{WOM} = .36^{*}.03 \approx .011.$$

Now we consider a customer satisfaction program is directed towards 1,000 customers and satisfaction is increased by one unit. For simplicity, we assume that the conversion rate remains the same. An expected number of $.36^{*}.03^{*}1000 = 11$ new customers will be acquired, in addition to the effects of satisfaction on retention.

In the industrial sample, the same calculations for $\Delta WOM$ yields 5 (scaling factor) ·0.115 (marginal effect)= 0.575 more referrals, given that WOM is increased by one unit. For $\Delta \text{Prob}(Switch)_{WOM}$, as indicated above, we obtained 0.142. Hence, increasing customer satisfaction by one unit would increase the average expected number of newly acquired customers by $0.575 \cdot 0.142 = 0.067$ customers (or in the 1,000 customer example, by 67 customers).

This approach for estimating the "return on satisfaction through WOM" effects can effectively extend existing ROC/CS models and thus make projections of satisfaction effects more realistic. For example, in the ROQ model by Rust et al. (1995) equations that account for customers' WOM referral behavior and for the number of "switched to us" and "new" customers acquired through WOM activities could be added.[4]

[4] For confidentiality reasons, we cannot display a precise monetary referral value estimated for the utility industry, but the expected number of new recruits through referrals should be indicative of its significance.

## Discussion and implications

The present study examines the links between customer satisfaction, WOM referrals, and new customer acquisition. In two empirical studies in a business-to-business and in a consumer context, we find that customer satisfaction affects WOM referral making, which in turn affects new customer acquisition. Hence, neglecting WOM effects in ROQ/CS models is likely to lead to underestimate the returns from increasing quality and satisfaction. Also, neglecting WOM effects would lead to underestimated customer lifetime value (CLV). Although our study was not specifically designed to capture WOM's contribution to CLV, we can use our results for some illustrative simulations that show the WOM value of some assumed customers. Further, our results help identifying customers who represent especially promising targets for marketing action because their WOM behavior is highly elastic.

### Linking WOM to customer lifetime value

Traditional CLV models and studies have assumed that future transactions of an individual customer can be projected, at least to some extend (e.g., Reinartz and Kumar 2000; Malthouse and Blattberg 2005). That WOM should not be ignored in such models has been emphasized repeatedly, but only one simulation study (Hogan et al. 2004) tries to quantify WOM value. Using our empirical results, we can, by multiplying independent variable scores with the derived parameter estimates, compute how much CLV would be underestimated when disregarding WOM effects. For example, a highly satisfied customer who is also high in product involvement and who is perceived as an expert by other customers will, on average, give slightly over four referrals and achieve a conversion rate of close to 10%. This customer type, which in our sample accounts for approximately 4% of the customer base, can be expected to acquire 4* 0.10=0.40 customers per time period.

For simplicity, let us assume that the cash contributions of the CLV of the acquired customers is, on average, equal to the cash contribution of the acquiring customer. This would imply a yearly underestimation of this customer's CLV by about 40%.

Of course, this customer type is not overly frequent. An "average" or "typical" customer who reaches scores around the average for each of our predictors would be expected to give 1.3 referrals and achieve around 0.05 conversion, which would result in $1.3 \cdot 0.05 = 0.065$ customers per year.

### Segmenting customers according to WOM responsiveness

On an operational level, a straightforward application of our results is to identify customer groups (such as highly

involved customers, market mavens, etc.) that are more likely than others to respond to satisfaction increases by giving more WOM. Figure 2 gives some indications for identifying such customers.

Hence, everything else being equal, return on customer satisfaction can be increased when firms are able to target customer groups with satisfaction programs that are high in involvement. Identifying such customers should be feasible since past research has shown that high product involvement is correlated with specific media usage and information search (Chaudhuri 1998). Further, market mavens, for which the relationship between satisfaction and WOM is also stronger, can be identified since they are more responsive to direct mails (Schneider and Rodgers 1993), more innovative (Feick and Price 1987) and engage more often in market helping behavior than other customers (Price et al. 1995).

Firms can further make use of situational involvement. As shown in our results, irrespective of their satisfaction level, newly acquired customer are likely to give WOM. Hence, newly acquired customers should be especially targeted with efforts for increasing WOM. Further, companies could try to stimulate situational involvement for existing customers. While the present study has focused on buying decisions as triggers of situational involvement, numerous opportunities for raising short-term customer involvement should exist via special events, promotions, etc. Those are especially important in a generally low-involvement product category such as utilities.

## Limitations and future research

As the field of quantifying the returns of customer management on WOM is rather new (Hogan et al. 2001), we were not able to tackle all problem areas in this first study, and certain limitations of our approach have to be noted. Also, we can foresee extensions in various areas for further investigation.

In this study we have confined our attention to positive WOM. However, research has repeatedly shown that negative WOM is at least equally, if not more, influential than positive WOM in affecting attitudes (e.g., Bone 1995). It would therefore be of great interest to analyze the "dissatisfaction-negative WOM-non-acquisition chain" and integrate this aspect into ROQ/CS-models. Ultimately, one should be able to derive at "negative" conversion rates, i.e., the probability that negative WOM leads to the non-acquisition of an otherwise newly recruited customer. We view this as an important issue for future research.

Clearly, the current framework could be applied in other contexts and extended to incorporate more independent variables. For comparison of the relevance of WOM for the customer satisfaction—new customer acquisition chain across product groups, category-level variables such as good vs. service, public vs. private consumption, or provider–consumer interactions could be integrated. Further, variables from social networks research, such as tie strength or the size of the social network, could be integrated in product categories where social networks are likely to play a more important role than in the present context.

Finally, it would be interesting to extend this research to customer referral programs (i.e., the provision of incentives for clients who provide evidence of a recruited new customer), in order to understand the moderators of the satisfaction-WOM-new customer acquisition link in this context. Such research may also show how extrinsic (e.g., incentives) and intrinsic (e.g., satisfaction) motivations jointly affect referral activity and its consequences.

**Acknowledgments** The authors would like to thank Robert East, George Zinkhan, Katherine Lemon and Patrick Lentz and two anonymous JAMS reviewers for their helpful comments on earlier drafts of the manuscript.

## Appendix

As mentioned, the dependent variable in the ZIP model is specified as

$$\begin{array}{lcll} y_i & \sim & 0 & \text{with probability } q_i \\ y_i & \sim & \text{Poisson} & \text{with probability } 1-q_i, \end{array}$$

where $y_i$ represents the expected number of referrals made by customer $i$. In the Logit case, $q_i$ is obtained through

$$q_i = \frac{e^{\gamma' w_i}}{1+e^{\gamma' w_i}} \tag{6}$$

where $y'$ represents the parameter estimates for independent variables $w_i$ that predict whether or not a referral is made. The conditional number of referrals made follows a standard Poisson process,

$$y_i^* = e^{\beta' x_i} \tag{7}$$

where $x_i$ denote the set of regressor variables with parameters $\beta'$ for the conditional number of counts $y_i^*$. $y_i$ is then generated through

$$y_i = z_i y_i^* \tag{8}$$

where $z_i$ represents the (0/1) outcome of the binary model and $y_i^*$ is the Poisson-distributed number of referrals made given that $z_i$=1.

Probabilities for certain outcomes can then be obtained through

$$\begin{aligned} &\text{Prob}[y_i=0] = \text{Prob}[z_i=0] + \text{Prob}\left[z_i=1, y_i^*=0\right] = q_i + (1-q_i)f(0) \\ &\text{Prob}[y_i=k] = (1-q_i)f(k), k=1,2,\ldots \end{aligned}$$

where $f(\cdot)$ is the Poisson-probability distribution for $y_i^*$.

In order to test whether the ZIP model provides an improvement over a more parsimonious standard Poisson model, econometric literature (e.g., Greene 2003) proposes the Voung-test (1989). The test is bi-directional and tests the Null-hypotheses that none of two non-nested models (e.g., the ZIP and the standard Poisson) outperforms the other. Specifically, Voung proposes the following test, which can easily be performed using LIMDEP 8.0:

$$V = \frac{\sqrt{n}\left[\frac{1}{n}\sum_{i=1}^{n} m_i\right]}{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(m_i - \overline{m})^2}}, \text{where } m_i = \log\left[\frac{f_1(y_i)}{f_2(y_i)}\right] \quad (9)$$

where $f_1$ and $f_2$ are competing probability models and $V$ is a statistical measure for testing that $E[m_i]$ is zero (i.e., none of the two models outperforms the other). If $V$ is larger than a defined critical value (e.g., 1.96), then $f_1$ is more favorable than $f_2$, while negative values above the critical value suggest that $f_2$ is superior to $f_1$. We performed this test using LIMDEP 8.0 (Greene 2003) with $f_1$ representing the ZIP model and $f_2$ the standard Poisson model. The empirical value for $V$ was 20.74, which favors the ZIP over the standard Poisson model, although the latter fits the data moderately well $\left(R_p^2 = .14 \text{ and } R_D^2 = .17\right)$.

Also, the Tobit-model suggested by Anderson (1998) and the combined Logit and truncated-at-zero NBD model by Bowman and Narayandas (2001) were compared with the ZIP with regard to their approximation of the distribution of WOM referrals. Both for the consumer and B2B study, the Tobit model approximates the data poorly, the logit/NBD model performs moderately well, and the ZIP model approximates the distribution of the data, in particular the zero outcomes, considerably well.

## References


Abratt, R., Nel, D., & Nezer, C. (1995). Role of the market maven in retailing: A general marketplace influencer. *Journal of Business and Psychology, 10*(1), 31–55.

Anderson, E. W., & Mittal, V. (2000). Strenghtening the satisfaction-profit-chain. *Journal of Service Research, 3*(2), 107–120.

Anderson, E. W., Fornell, C., & Lehman, D. (1994). Customer satisfaction, market share, and profitability: Findings from Sweden. *Journal of Marketing, 58*, 53–66.

Anderson, E. W. (1998). Customer satisfaction and word-of-mouth. *Journal of Service Research, 1*(1), 5–17.

Arndt, J. (1967). The role of product-related conversation in the diffusion of a new product. *Journal of Marketing Research, 1*(4), 291–295.

Bansal, H. S., & Voyer, P. A. (2000). Word-of-mouth processes within a services purchase decision context. *Journal of Service Research, 3*(2), 166–177.

Bolton, R., Lemon, K., & Verhoef, P. C. (2004). The theoretical underpinnings of customer asset management. *Journal of the Academy of Marketing Science, 32*(3), 271–292.

Bone, P. F. (1995). Word-of-mouth effects on short-term and long-term product judgements. *Journal of Business Research, 32*(3), 213–223.

Bowman, D., & Narayandas, D. (2001). Managing customer-initiated contacts with manufacturers: The impact on share of category requirements and word-of-mouth behavior. *Journal of Marketing Research, 38*, 281–297.

Brennan, M., & Chan, J. (1996). Improving the accuracy of recall data: A test of two procedures. *Marketing Bulletin, 7*, 20–29.

Brown, J. J., & Reingen, P. H. (1987). Social ties and word-of-mouth referral behavior. *Journal of Consumer Research, 14*, 350–362.

Bunn, M. D. (1993). Taxonomy of buying decision approaches. *Journal of Marketing, 57*(1), 38–57.

Burton, S., & Blair, E. (1991). Task condition, response formulation processes, and response accuracy for behavioral frequency questions in surveys. *Public Opinion Quarterly, 55*, 50–79.

Cannon, J. P., & Perreault, W. D., Jr. (1999). Buyer-seller relationships in business markets. *Journal of Marketing Research, 36*(4), 439–460.

Celsi, R. L., & Olson, J. C. (1988). The role of involvement in attention and comprehension processes. *Journal of Consumer Research, 15*, 210–224.

Chaudhuri, A. (1998). Product class effects on perceived risk: The role of emotion. *International Journal of Research in Marketing, 15*, 157–168.

Dichter, E. (1966). How word-of-mouth advertising works. *Harvard Business Review, 44*, 147–157.

Engel, J. F., Kegerreis, R. J., & Blackwell, R. D. (1969). Word-of-mouth communication by the innovator. *Journal of Marketing, 33*(3), 15–19.

East, R., Lomax, W., & Narain, R. (2001). Customer tenure, recommendation and switching. *Journal of Consumer Satisfaction, Dissatisfaction & Complaining Behavior, 14*, 46–54.

Feick, L. F., & Higie, R. A. (1992). The effects of preference heterogeneity and source characteristics on ad processing and judgments about endorsers. *Journal of Advertising, 21*, 9–23.

Feick, L. F., & Price, L. L. (1987). The market maven: A diffuser of marketplace information. *Journal of Marketing, 51*, 83–97.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*, 117–140.

Fornell, C., Johnson, M. D., Anderson, E. D., Cha, J., & Bryant, B. E. (1996). The American customer satisfaction index: Nature, purpose and findings. *Journal of Marketing, 58*, 1–19.

Gilly, M. C., Graham, J. L., Wolfinbarger, M. F., & Yale, L. J. (1998). A dyadic study of interpersonal information search. *Journal of the Academy of Marketing Science, 26*(2), 83–100.

Greene, W. H. (1994). *Accounting for excess zeros and sample selection in Poisson and negative binomial regression models*. New York: Stern School of Business, Economics Department, Working Paper EC-94-10.

Greene, W. H. (2003). *Econo*metric analysis (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Herr, P. M., Kardes, F. R., & Kim, J. (1991). Effects of word-of-mouth and product-attribute information on persuasion: An accessibility-diagnosticity perspective. *Journal of Consumer Research, 17*(3), 454–462.

Heskett, J. L., Jones, T. O., Loveman, G. W., Sasser, W. E., & Schlesinger, L. (1994). Putting the service-profit chain to work. *Harvard Business Review, 72*, 164–174.

Hogan, J. E., Lemon, K. N., & Libai, B. (2001). Incorporating positive word-of-mouth into customer profitability models. Working Paper. Boston College.

Hogan, J. E., Lemon, K. N., & Libai, B. (2004). Quantifying the ripple: Word-of-mouth and advertising effectiveness. *Journal of Advertising Research, 44*, 271–280.

Homburg, C., & Rudolph, B. (2001). Customer satisfaction in industrial markets: Dimensional and multiple role issues. *Journal of Business Research, 52*, 15–33.

Houston, M. J., & Rothschild, M. L. (1978). Conceptual and methodological perspectives on involvement. In S. C. Jain (Ed.), *Educators' proceedings* (pp. 184–187). Chicago, IL: American Marketing Association.

Hunt, S. D. (1970). Post-transaction communications and dissonance reduction. *Journal of Marketing, 34*, 46–51.

Jacoby, J., & Hoyer, W. D. (1981). What if opinion leaders didn't know more: A question of nomological validity. In K. B. Monroe (Ed.), *Advances in consumer research* (Vol. 8, pp. 299–303). Ann Arbor, MI: Association for Consumer Research.

Kamakura, W., Mittal, V., de Rosa, F., & Mazzon, J. A. (2002). Assessing the service-profit chain. *Marketing Science, 21*, 294–317.

Kamins, M. A. (1990). An investigation into the "match-up" hypothesis in celebrity advertising: When beauty may be only skin deep. *Journal of Advertising, 19*(1), 4–13.

Kassarjian, H. H. (1981). Low-involvement: A second look. In K. B. Monroe (Ed.), *Advances in consumer research* (Vol. 8, pp. 31–34). Ann Arbor, MI: Association for Consumer Research.

Kelman, H. C. (1961). Processes of opinion change. *Public Opinion Quarterly, 25*, 57–78.

Malthouse, E. C., & Blattberg, R. C. (2005). Can we predict customer lifetime value? *Journal of Interactive Marketing, 19*(1), 2–16.

Manski, C. F., & McFadden, D. L. (1981). *Structural analysis of discrete data and econometric applications*. Cambridge: MIT Press.

Mittal, V., & Kamakura, W. (2001). Satisfaction, repurchase intent, and repurchase behavior: Investigating the moderating effect of customer characteristics. *Journal of Marketing Research, 38*(1), 131–142.

Money, R. B., Gilly, M. C., & Graham, J. L. (1998). Explorations of national culture and word-of-mouth referral behavior on the purchase of industrial services in the United States and Japan. *Journal of Marketing, 62*, 76–87.

Morwitz, V. G. (1997a). Why consumers don't always accurately predict their own future behavior. *Marketing Letters, 8*, 57–70.

Morwitz, V. G. (1997b). It seems like only yesterday: The nature and consequences of telescoping error in marketing research. *Journal of Consumer Psychology, 6*(1), 1–29.

Murray, K. B. (1991). A test of services marketing theory: Consumer information acquisition activities. *Journal of Marketing, 5*, 10–25.

Nataraajan, R., & Angur, M. G. (1997). A quest for the "industrial maven". *Industrial Marketing Management, 26*, 353–362.

Naylor, G. (1999). Why do they whine? An examination into the determinants of negative and positive word-of-mouth. *Journal of Consumer Satisfaction, Dissatisfaction & Complaining Behavior, 12*, 162–169.

Oliver, R. L. (1997). *Satisfaction: A behavioral perspective on the consumer*. New York, NY: Irwin/McGraw-Hill.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64*(1), 12–40.

Price, L. L., Feick, L. F., & Guskey, A. (1995). Everyday market helping behavior. *Journal of Public Policy & Marketing, 14*(2), 255–266.

Price, L. L., Feick, L. F., & Higie, R. A. (1989). Preference heterogeneity and coorientation as determinants of perceived informational influence. *Journal of Business Research, 19*, 227–242.

Reichheld, F. F., & Sasser, E. (1990). Zero-defections: Quality comes to services. *Harvard Business Review, 68*(5), 105–111.

Reinartz, W. J., & Kumar, V. (2000). On the profitability of long-life customers in a noncontractual setting: An empirical investigation and implications for marketing. *Journal of Marketing, 64*, 17–35.

Richins, M. L., & Bloch, P. H. (1986). After the new wears off: The temporal context of product involvement. *Journal of Consumer Research, 13*, 280–285.

Richins, M. L., & Bloch, P. H. (1991). Post-purchase product satisfaction: Incorporating the effects of involvement and time. *Journal of Business Research, 23*, 145–158.

Richins, M. L., & Root-Shaffer, T. (1988). The role of involvement and opinion leadership in consumer word-of-mouth: An implicit model made explicit. In M. J. Houston (Ed.), *Advances in consumer research* (Vol. 15, pp. 32–35). Provo, UT: Association for Consumer Research.

Rogers, E. (1995). *Diffusion of innovations* (4th ed.). New York: Free.

Rust, R. T., Lemon, K. N., & Zeithaml, V. (2004). Return on marketing: Using customer equity to focus marketing strategy. *Journal of Marketing, 67*, 109–127.

Rust, R. T., Moorman, C., & Dickson, P. R. (2002). Getting return on quality: Revenue expansion, cost reduction, or both? *Journal of Marketing, 66*, 7–24, October.

Rust, R. T., & Zahorik, A. J. (1993). Customer satisfaction, customer retention, and market share. *Journal of Retailing, 69*, 193–215.

Rust, R. T., Zahorik, A. J., & Keiningham, T. L. (1995). Return on quality (ROQ): Making service quality financially accountable. *Journal of Marketing, 59*, 58–70.

Schneider, K. C., & Rodgers, W. C. (1993). Generalized marketplace influencers' (market mavens') attitudes toward direct mail. *Journal of Direct Marketing, 7*(4), 20–28.

Slama, M. E., & Williams, T. G. (1990). Generalizations of market maven's information provision tendency across product categories. In T. K. Srull (Ed.), *Advances in consumer research*, Vol. 17. Provo, UT: Association for Consumer Research.

Slama, M. E., & Tashchian, A. (1985). Selected socioeconomic and demographic characteristics associated with purchasing involvement. *Journal of Marketing, 49*, 72–82.

Sudaraman, D. S., Mitra, K., & Webster, C. (1998). Word-of-mouth communications: a motivational analysis. In E. J. Arnoud & L. M. Scott (Eds.), *Advances in consumer research* (Vol. 25, pp. 527–531). Provo, UT: Association for Consumer Research.

Swan, J. L., & Oliver, R. L. (1989). Post-purchase communications by consumers. *Journal of Retailing, 65*, 516–533.

Voung, Q. (1989). Likelihood ratio tests for model selection and non-nested hypotheses. *Econometrica, 57*, 307–334.

Westbrook, R. (1987). Product/consumption-based affective responses and post-purchase processes. *Journal of Marketing Research, 20*, 296–304.

Yale, L. J., & Gilly, M. C. (1995). Dyadic perceptions in personal source information search. *Journal of Business Research, 32*, 225–234.

Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of Consumer Research, 12*, 341–352.

Zeithaml, V. (2000). Service quality, profitability, and the economic worth of customers: What we know and what we need to learn. *Journal of the Academy of Marketing Science, 28*(1), 67–85.