Consumer Decision-making Processes in Mobile Viral Marketing Campaigns

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Abstract

The high penetration of cell phones in today’s global environment offers a wide range of promising mobile marketing activities, including mobile viral marketing campaigns. However, the success of these campaigns, which remains unexplored, depends on the consumers’ willingness to actively forward the advertisements that they receive to acquaintances, e.g., to make mobile referrals. Therefore, it is important to identify and understand the factors that influence consumer referral behavior via mobile devices. The authors analyze a three-stage model of consumer referral behavior via mobile devices in a field study of a firm-created mobile viral marketing campaign. The findings suggest that consumers who place high importance on the purposive value and entertainment value of a message are likely to enter the interest and referral stages. Accounting for consumers’ egocentric social networks, we find that tie strength has a negative influence on the reading and decision to refer stages and that degree centrality has no influence on the decision-making process.

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Introduction

The effectiveness of traditional marketing tools appears to be diminishing as consumers often perceive advertising to be irrelevant or simply overwhelming in quantity (Porter and Golan 2006). Therefore, viral marketing campaigns may provide an efficient alternative for transmitting advertising messages to consumers, a claim supported by the increasing number of successful viral marketing campaigns in recent years. One famous example of a viral marketing campaign is Hotmail, which acquired more than 12 million customers in less than 18 months via a small message attached at the end of each outgoing mail from a Hotmail account informing consumers about the free Hotmail service (Krishnamurthy 2001). In addition to Hotmail, several other companies, such as the National Broadcasting Company (NBC) and Proctor & Gamble, have successfully launched viral marketing campaigns (Godes and Mayzlin 2005).

In general, a viral marketing campaign is initiated by a firm that actively sends a stimulus to selected or unselected consumers. However, after this initial seeding, the viral marketing campaign relies on peer-to-peer communications for its successful diffusion among potential customers. Therefore, viral marketing campaigns build on the idea that consumers attribute higher credibility to information received from other consumers via referrals than to information received via traditional advertising (Godes and Mayzlin 2005). Thus, the success of viral marketing campaigns requires that consumers value the message that they receive and actively forward it to other consumers within their social networks.

Mobile devices such as cell phones enhance consumers’ ability to quickly, easily and electronically exchange information about products and to receive mobile advertisements immediately at any time and in any location (e.g., using mobile text message ads) (Drossos et al. 2007). As cell phones have the potential to reach most consumers due to their high penetration rate (cf., EITO 2010), they appear to be well suited for viral marketing campaigns. As a result, an increasing number of companies are using mobile devices for marketing activities.

Research on mobile marketing has thus far devoted limited attention to viral marketing campaigns, particularly with respect to the decision-making process of consumer referral behavior for mobile viral marketing campaigns, e.g., via mobile text messages. Thus, the factors that influence this process remain largely unexplored. The literature on consumer decision-making suggests that consumers undergo a multi-stage process after receiving a
stimulus (e.g., a mobile text message) and before taking action (e.g., forwarding the text message to friends) (Bettman 1979; De Bruyn and Lilien 2008). At different stages of the process, various factors that influence consumer decision-making can be measured using psychographic, sociometric, and demographic variables as well as by consumer usage characteristics. Whereas previous studies have mainly focused on selected dimensions, our study considers variables from all categories.

De Bruyn and Lilien (2008) analyzed viral marketing in an online environment and discussed relational indicators of business students who had received unsolicited e-mails from friends. This study provided an important contribution and amplified our understanding about how viral campaigns work. The present paper differs from the work of De Bruyn and Lilien (2008) and goes beyond their findings in four important ways: actor, medium, setting, and consumer characteristics. The first difference is the actor involved. In viral campaigns, the initiator, usually a company, sends the message to the seeding points (first level). Next, the seeding points forward the message to their contacts (second level), and so on. Whereas De Bruyn and Lilien’s (2008) campaign focused on the second-level actors, the present study focuses on the first-level actors, e.g., the direct contacts of the company. We believe that for the success of a campaign, additional insights into the behavior of first-level actors are very important because if they do not forward the message, it will never reach the second-level actors. The second difference is the medium used in the campaign. Although we cannot explicitly rule out that participants of De Bruyn and Lilien’s (2008) campaign used mobile devices, they conducted their campaign at a time when the use of the Internet via mobile devices was still very uncommon. Therefore, it is reasonable to assume that at least the majority of their participants used a desktop or a laptop computer when they participated in De Bruyn and Lilien’s (2008) campaign. In contrast, the present study explicitly uses only text messages to mobile devices. In addition, mobile phones are a very personal media which is used in a more active way compared to desktop or laptop computers (Bacile, Ye, and Swilley 2014). The third difference is the setting in which the viral campaign takes place. Whereas the participants in the study by De Bruyn and Lilien (2008) were business students from a northeastern US university, we conduct a mobile marketing campaign in a field setting using randomly selected customers. The fourth and most important difference is that De Bruyn and Lilien (2008) focused exclusively on relational characteristics. In addition to relational characteristics, this paper also considers variables that describe demographic factors, psychographic factors, and usage characteristics. As these variables yield significant results, the study and its findings go beyond the findings of De Bruyn and Lilien (2008).

The main goal and contribution of this work is, first, to analyze consumers’ decision-making processes regarding their forwarding behavior in response to mobile advertising via their cell phone (i.e., text messages) in a mobile environment using a real-world field study. To analyze consumers’ decision-making processes, we use a three-stage sequential response model of the consumer decision-making process. Additionally, we integrate consumers’ egocentric social networks into a theoretical framework to consider social relationships (e.g., tie strength, degree centrality) when analyzing mobile viral marketing campaigns. Thus, to understand referral behavior, we integrate psychographic (e.g., usage intensity) and sociometric (e.g., tie strength) indicators of consumer characteristics. We are then able to determine the factors that influence a consumer’s decision to refer a mobile stimulus and are able to identify the factors that lead to reading the advertising message and to the decision to learn more about the product.

Related Literature

Viral Marketing and Factors that Influence Consumer Referral Behavior

Viral marketing campaigns focus on the information spread of customers, that is, their referral behavior regarding information or an advertisement. Companies are interested in cost-effective marketing campaigns that perform well. Viral marketing campaigns aim to meet these two goals and can, accordingly, have a positive influence on company performance (Godes and Mayzlin 2009). Companies can spread a marketing message with the objective of encouraging customers to forward the message to their contacts (e.g., friends or acquaintances) (Van der Lans et al. 2010). In this way, the company then benefits from referrals among consumers (Porter and Golan 2006). Referrals that result from a viral marketing campaign attract new customers who are likely to be more loyal and, therefore, more profitable than customers acquired through regular marketing investments (Trusov, Bucklin, and Pauwels 2009).

Two streams of research can be identified. The first is the influence of viral marketing on consumers, and the second is research that has analyzed the factors that lead to participating in viral marketing campaigns. First, previous research identified that viral marketing influences consumer preferences and purchase decisions (East, Hammond, and Lomax 2008). Further, an influence on the pre-purchase attitudes was identified by Herr, Kardes, and Kim (1991). In addition, viral marketing also influences the post-usage perceptions of products (Bone 1995).

Second, previous research has identified satisfaction, customer commitment and product-related aspects as the most important reasons for participating in viral marketing campaigns (cf., Bowman and Narayandas 2001; De Matos and Rossi 2008; Maxham and Netemeyer 2002; Moldovan, Goldenberg, and Chattopadhyay 2011). With respect to psychological motives, self-enhancement was identified as a motive for consumers to generate referrals (De Angelis et al. 2012; Wojnicki and Godes 2008). The importance of self-enhancement in addition to social benefits, economic incentives and concern for others was identified as a motive behind making online referrals (Hennig-Thurau et al. 2004). Referrals can be differentiated into positive and negative referrals. Anxiety reduction, advice seeking and vengeance are factors that contribute to negative referrals (Sundaram, Mitra, and Webster 1998).

Within the referral process, the relationships and social network position of the consumer are also influential. For example, Bampo et al. (2008) found that network structure is...
important in viral marketing campaigns. Furthermore, it has been determined that consumers are more likely to activate strong ties than weak ties when actively searching for information (Brown and Reingen 1987) because strong ties tend to be high-quality relationships (Bian 1997; Portes 1998). In addition, targeting consumers who have a high degree centrality (e.g., quantity of relationships) leads to a higher number of visible actions, such as page visits, than do random seeding strategies (Hinz et al. 2011). Kleijnen et al. (2009) analyzed the intention to use mobile services using sociometric variables and evaluated how consumers’ network positions influence their intentions to use mobile services. However, the previous study contributes to the literature by analyzing a different research question than is examined in our paper. Specifically, Kleijnen et al. (2009) focused on the intention to use services, while our study focuses on consumers’ decision-making processes until they make a referral. In summary, previous research focused on the consumers’ psychographic constructs or relationships and social networks to explore why consumers participate in viral marketing campaigns and why they make referrals, two constructs that are rarely analyzed together. Iyengar, Van den Bulte, and Valente (2011) used both constructs jointly and found that correlations between the two are low. However, this study did not take place in an online or mobile context but rather in the context of referrals for new prescription drugs between specialists. In contrast, our study analyzes both aspects together within a mobile viral marketing campaign.

In addition to offline- or online-based viral marketing activities, an increasing number of companies are conducting marketing campaigns using mobile phones, and promising approaches include mobile viral marketing campaigns. Research on mobile viral marketing is relatively unexplored because most research in the field of mobile marketing analyzes marketing activities such as mobile couponing (Dickinger and Kleijnen 2008; Reichhart, Pescher, and Spann 2013), the acceptance of advertising text messages (Tsang, Ho, and Liang 2004) or the attitudes toward (Tsang, Ho, and Liang 2004) and the acceptance of mobile marketing (Sultan, Rohm, and Gao 2009). In the context of mobile viral marketing research, Hinz et al. (2011) studied mobile viral marketing for a mobile phone service provider and determined that the most effective seeding strategy for customer acquisition is to focus on well-connected individuals. In contrast to our study, their referrals were conducted via the Internet (i.e., the companies’ online referral system) rather than via a mobile device (i.e., forwarding the text message immediately). Nevertheless, generating referrals using a mobile device can affect referral behavior. Palka, Poustchi, and Wiedemann (2009) postulated a grounded theory of mobile viral marketing campaigns and found that trust and perceived risk are important factors in the viral marketing process. In comparison to our study, they used qualitative methods and did not conduct a real-world field study. Okazaki (2008) identified, for Japanese adolescents, consumer characteristics such as purposive value and entertainment value are the main factors in mobile viral marketing campaigns and that these factors significantly influence the adolescents’ attitudes toward viral marketing campaigns. Furthermore, both purposive value and entertainment value are influenced by the antecedents’ group-person connectivity, commitment to the brand, and relationship with the mobile device. In contrast to our study, Okazaki (2008) did not analyze whether referrals were made, nor did he analyze the referrals that were directly made via a mobile device by forwarding the mobile text message. Instead, he analyzed the general viral effect in the form of telling or recommending the mobile advertising campaign. Further, our field study analyzes the entire consumer decision-making process for a mobile viral marketing campaign via text messages across the three stages: from stage one, reading, to stage two, interest, to stage three, decision to refer.

To summarize, in contrast to the existing studies in the field of mobile viral marketing, we analyze consumers’ egocentric networks via measures such as tie strength and degree centrality. These sociometric factors are analyzed jointly with psychographic constructs across the three stages in the decision-making process. Thus, our study uses a real-world mobile viral marketing campaign and enables us to test the relative importance of social embeddedness and consumer characteristics with respect to consumers’ decision to forward mobile messages.

**Decision-making Process and Specifics of the Mobile Environment**

Consumer decision-making is a multiple-stage process (Bettman 1979; De Bruyn and Lilien 2008; Lavidge and Steiner 1961). In a viral marketing campaign, the final goal is to generate a high number of referrals. Therefore, our model of consumer forwarding behavior is designed for the specific situation of mobile viral marketing campaigns.

The process and first stage begin with the consumer reading a mobile advertising text message on his or her mobile phone. If this text message sparks the consumer’s interest and the consumer wants to learn more about the offered product, he/she enters the interest stage, which is the second stage of the model. If the consumer finds the product interesting after learning about it, he or she makes a referral, which is the third stage of our model (decision to refer).

In this study, we analyze the stages of the consumer decision-making processes within a mobile environment, i.e., within a mobile viral marketing campaign. There are several differences between mobile viral marketing and online or offline viral marketing. A mobile text message is more intrusive than an e-mail because it appears immediately on the full screen. Consumers usually carry their mobile phone with them and a mobile message may also reach them in a private moment. Contrary, consumers may need to purposely look into their e-mail accounts to receive e-mails. Therefore a mobile message can be more personal compared to an e-mail. In comparison to offline face-to-face referrals, mobile referrals do not possess this personal aspect and can be transmitted digitally within a few minutes to several friends in different places simultaneously. This is not possible in the offline world. Additionally, a mobile referral can reach the recipient faster than an e-mail or an offline referral. Thus, the mobile device may influence the referral behavior due to its faster digital transmission of information.
Development of Hypotheses

While the factors that influence the stages of the decision-making process can be divided into two groups, we analyze them jointly in this study. The first group consists of the psychographic indicators of consumer characteristics, thus focusing on each consumer’s motivation to participate in the campaign and his or her usage behavior. The second group of factors includes sociometric indicators of consumer characteristics, thus providing information about the type of relationship that the consumer has with his or her contacts and his or her resulting social network.

Psychographic Indicators of Consumer Characteristics

As mentioned in the related literature section, according to Okazaki (2008), in viral marketing campaigns, purposive value and entertainment value are the primary value dimensions for consumers. This insight is based on the finding that consumers gain two types of benefits from participating in sales promotions: hedonic and utilitarian benefits (Chandon, Wansink, and Laurent 2000). Hedonic benefits are primarily intrinsic and can be associated with entertainment value. Consumers participate voluntarily and derive value from the fun of interacting with peers by forwarding a referral (e.g., an ad might be of interest to peer recipients) (Dholakia, Bagozzi, and Pearo 2004). A previous study found that the entertainment factor influences intended use in mobile campaigns (Palka, Pousttchi, and Wiedemann 2009). Okazaki (2008) found that in a mobile viral marketing campaign, the entertainment value directly influences the recipient’s attitude toward the campaign, which, in turn, influences the recipient’s intention to participate in a mobile viral campaign. Phelps et al. (2004) showed that the entertainment value is a factor that increases consumers’ forwarding behavior in viral marketing campaigns conducted via e-mail. Thus, we may presume that consumers who place high importance on the entertainment value of exchanging messages are more likely to enter the reading and interest stages than consumers who do not value entertainment to the same degree. Additionally, the entertainment value can also influence the decision to refer (i.e., forwarding) behavior because a text message that addresses consumers who place high importance on entertainment value causes the recipient to think about forwarding the text message and motivates them to forward the mobile advertisement to friends (i.e., decision to refer stage).

**H1.** Consumers who place high importance on the entertainment value of a message are more likely to a) enter the reading stage, b) enter the interest stage and c) enter the decision to refer stage.

As utilitarian benefits are instrumental and functional, they can be associated with purposive value (Okazaki 2008). Dholakia, Bagozzi, and Pearo (2004) analyzed the influence of purposive value in network-based virtual communities and found that purposive value is a predictor of social identity and a key motive for an individual to participate in virtual communities. With respect to the mobile context, previous research found that purposive value has a direct, significant influence on a consumer’s attitude toward a mobile viral marketing campaign and that this attitude significantly influences the intention to participate in mobile marketing campaigns (Okazaki 2008). For some consumers, forwarding a (mobile) advertisement in a viral marketing campaign can have a personal and a social meaning (e.g., doing something good for friends by forwarding the ad). Thus, we hypothesize that consumers who place high importance on the purposive value of exchanging messages will display a greater likelihood to enter the reading and interest stages. We also hypothesize that consumers who place high importance on the purposive value of a message are more likely to refer.

**H2.** Consumers who place high importance on the purposive value of a message are more likely to a) enter the reading stage, b) enter the interest stage and c) enter the decision to refer stage.

The intensity of usage (e.g., a high quantity of written text messages) positively influences the probability of trial and adoption (Steenkamp and Gielens 2003). Thus, consumers with high usage intensities are more likely to actively participate in a mobile viral marketing campaign. As mobile viral marketing campaigns are a fairly new form of advertising, consumers with high usage intensities are more likely to participate in mobile viral marketing campaigns and are more likely to forward messages than consumers with low usage intensities. Therefore, we propose that usage intensity has an effect on the decision to forward a mobile advertising text message. The likelihood of deciding to forward the mobile advertisement increases with the usage intensity of mobile text messages. This proposition is consistent with Neslin, Henderson, and Quelch (1985), who found that the promotional acceleration effect is stronger for heavy users than it is for other consumers. Godes and Mayzlin (2009) analyzed the effectiveness of referral activities and argued that the sales impact from less loyal customers is greater, but they also highlighted that this greater sales impact does not mean that the overall referrals by less loyal customers have a greater impact than those by highly loyal customers. They concluded that companies who want to implement an exogenous referral program to drive sales should focus on both less loyal and highly loyal customers because focusing only on highly loyal or less loyal customers is not necessarily the cornerstone of a successful viral marketing campaign. In the online context, a previous study found that experience with the Internet influences channel usage behavior (Frambach, Roest, and Krishnan 2007). Thus, as consumers with high usage intensity are used to communicating with mobile phones, they know how to write, read and forward mobile text messages. Accordingly, it is likely that the threshold to forward a text message is lower for consumers with high usage intensity than it is for other consumers and that such consumers are thus more inclined to refer. Further, the minimal effort required to directly forward a mobile text message via a cell phone increases the decision to refer. Thus, we hypothesize that heavy mobile users will be more likely to refer than will light users.

**H3.** The usage intensity of the referral medium has a positive influence on the likelihood of making the decision to refer.
Sociometric Indicators of Consumer Characteristics

Sociometric indicators describe the interaction structure of an individual consumer with his or her surroundings. When consumers receive an interesting mobile advertising message, it is likely that they want to find out more about it. Once the consumer has visited the product homepage, he or she then considers not only whether the message is worth forwarding but also to whom it should be forwarded.

Sociometric indicators provide information about the social network of each individual consumer. This individual network influences the likelihood of knowing someone who may be interested in the offered product. Thus, social networks have a significant impact on the decision-making process in a viral marketing campaign. The decision to forward the mobile advertising message depends on two factors: the quality and the quantity of relations, i.e., the tie strength and the degree centrality.

Tie strength is an important factor in viral marketing and increases with the amount of time spent with the potential recipient and with the degree of emotional intensity between the sender and the potential recipient (Marsden and Campbell 1984). Consumers perceive strong ties to be more influential than weak ties (Brown and Reingen 1987) because the strong ties seem more trustworthy (Rogers 1995). Therefore, because consumers are more motivated to provide high-value information to strong ties (Frenzen and Nakamoto 1993), tie strength is an indicator of the quality of the relationship.

Reagens and McEvily (2003) studied how social network factors influence knowledge transfer at an R&D firm. To measure the tie strength, they used two items that are analogous to those that we used (Burt 1984). Their results indicated that tie strength positively influences the ease of knowledge transfer. Thus, network ties increase a person’s capability to send complex ideas to heterogeneous persons. Overall, they highlighted the importance of tie strength with respect to the knowledge transfer process, and they postulate that tie strength holds a privileged position. Other studies found that weak ties make non-redundant information available (Levin and Cross 2004). In an online setting, participants were more likely to share information with strong ties than with weak ties (Norman and Russell 2006). With respect to viral marketing conducted via e-mail, previous research has found that tie strength has a significant influence on whether the recipient examines the e-mail message sent from a friend (i.e., opens and reads the message) (De Bruyn and Lilien 2008). Tie strength was also determined to be less relevant in an online setting compared to an offline setting (Brown, Broderick, and Lee 2007). In a non-mobile or non-online context, stronger ties are more likely to activate the referral flow (Reingen and Kernan 1986). Furthermore, tie strength is positively related to the amount of time spent receiving positive referrals (van Hoeye and Lievens 1994).

As previously mentioned, research on word-of-mouth behavior has shown that people engage in word-of-mouth for reasons such as altruism (Sundaram, Mitra, and Webster 1998). However, Sundaram, Mitra, and Webster (1998) did not control for the quality of a relationship between sender and recipient. Research concerning referral reward programs has identified that offering a reward increases the referral intensity and has a particular impact on weak ties (Ryu and Feick 2007). Brown and Reingen 1987 found that while strongly tied individuals exchange more information and communicate more frequently, weak ties play an important bridging role. Additionally, Granovetter (1973) stated that one is significantly more likely to be a bridge in the case of weak ties than in strong ties. In job search, when using personal networks, it was found that weak ties have a higher rate of effectiveness when addressing specialists for jobs compared to strong ties (Bian 1997) and that the income of people using weak ties was greater than those who used strong ties (Lin, Ensel, and Vaughn 1981). At the information level, consumers who are connected via strong ties tend to share the same information that is rarely new to them, while consumers obtain important information from weak ties who tend to possess information that is “new” to them (Granovetter 1973). Consistent with this finding, Levin and Cross (2004) found that novel insights and new information are more likely to pass along weak ties than between strong ties. As in our study, viral marketing information can be perceived as a novel insight or new information. Given that consumers are more likely to send a message to someone if the content is new to the receiver, it is more likely that consumers will forward the text message to a weak tie than to a strong tie. Thus, we presume that consumers prefer to forward mobile advertising text messages, such as the one used in our study (for a new music CD), to other customers with whom they are connected through weak ties.

Similarly, Frenzen and Nakamoto (1993) postulate that the motivation to share information or refer a product is driven by the value of the information and the cost of sharing. They identified (though only for weak ties) an influence of word-of-mouth that is spread by value and opportunity costs. In our case, when customers forward a mobile advertising message, the opportunity cost is low because forwarding can be done easily and without any effort (e.g., compared to meeting the friend personally in the city). In the case of strong ties, the preferences of the recipient (e.g., for products) are well known to the sender, whereas these preferences are unclear for weak ties. Thus, people who want to do something beneficial for their contacts know the likelihood that it will benefit the recipient in the case of strong ties, but they do not know the benefit it may bring to weak ties. In our study, this benefit involved sharing information to acquire a free new music CD. Because the costs of sharing are low using cell phones, people are more inclined to forward such information. With respect to strong ties, people know whether the information is relevant. Furthermore, relationships to strong ties are more important than relationships to weak ties. Importantly, people do not want to displease strong ties by sending irrelevant information or cause information overload with unsuitable information. In the case of receiving annoying information, the recipient could ask the sender not to forward text messages anymore. This sanction is more painful when received from strong ties (e.g., good friends) than from weak ties (e.g., acquaintances) because the weak ties are less important to the sender. This is similar to the finding that people who are dissatisfied (e.g., with a product or service) are more likely to advise against the purchasing of the product to strong ties rather than to weak ties (Wirtz and Chew 2002), which may also be due to the sanction issue. In
mobile viral marketing campaigns, because the sharing of information is easy and not costly, factors such as knowledge about the preferences of the recipient or the fear of annoying strong ties become more important when deciding whether and to whom to refer the message.

Thus, we hypothesize the following:

**H4.** Tie strength has a negative influence on the likelihood of making the decision to refer.

Diffusion occurs via replication or transfer, e.g., of used goods (Borgatti 2005). Within the group of replication processes, replications can occur one at a time (serial duplication), e.g., gossip or viral infections, or simultaneously (parallel duplication), e.g., e-mail broadcasts or text messages on mobile phones. Degree centrality is a measure that is suitable for analyzing processes in which a message is duplicated simultaneously because it can be interpreted as a measure of immediate influence — the ability to “infect” others directly (Borgatti 2005, p 62). Hubs are identified using degree centrality because they are actors who possess a high number of direct contacts (Goldenberg et al. 2009) and because they know a high number of people to whom they can forward a message and can thus influence more people (Hinz et al. 2011). Hubs also adopt earlier in the diffusion process. In detail, innovative hubs increase the speed of the adoption process, while follower hubs influence the size of the total market (Goldenberg et al. 2009). Further, hubs tend to be opinion leaders (Kratzer and Lettl 2009; Rogers and Cartano 1962) because they have a high status and serve as reference points in the information diffusion process. Small groups of opinion leaders often initiate the diffusion process of innovations (Van den Bulte and Joshi 2007). Czepiel (1974) analyzed whether centrality in opinion networks influenced the adoption and found no significance for this, a finding that is contrary to other literature in the field (e.g., Goldenberg et al. 2009). Furthermore, targeting central customers leads to a significant increase in the spread of marketing messages (Kiss and Bichler 2008). In a viral marketing campaign for a mobile service where referrals are conducted via the Internet (i.e., online referral system) and not via forwarding a mobile text message, the results showed that high centrality increases the likelihood of participation (Hinz et al. 2011). Therefore, we hypothesize that degree centrality has a positive influence on the decision to refer.

**H5.** Degree centrality has a positive influence on the likelihood of making the decision to refer.

**Empirical Study**

**Goal and Research Design**

The goal of this empirical study is to test the hypotheses derived above using a three-stage model that represents the stages of a consumer’s decision-making process in a mobile referral context.

In our field study, we conducted a mobile marketing campaign. The randomly chosen participants had previously agreed to receive mobile advertising text messages on their cell phones (opt-in program). We sent a text message to 26,137 randomly chosen customers that included a link to a website and the notice that they could download a recently released music CD for free. The only purpose of this website was to give the campaign’s participants the option to download the music CD for free. In the text message, they were also asked to forward the message to their contacts. The exact text of the message stated, “Amazing! You & your friends will receive a new CD as an MP3 for free! No subscription! Available online: URL.com -> Forward this text message to your friends now!”

One week later, we sent another text message to all of the participants who received the initial mobile advertising text message with a link to an online survey. This second text message contained the request to participate in an online survey. We provided one 100 Euro and two 50 Euro prizes as incentives to participate in the survey. The winners were drawn in a lottery. In the questionnaire, the participants provided information about their behavior during different stages of the referral process and about their psychological constructs and egocentric networks (Burt 1984). Egocentric networks are networks that analyze the focal actor and the actor’s direct friends as well as the relations that exist between them (Burt 1984).

**Measures**

The psychographic constructs “purposive value” and “entertainment value” were adapted from Dholakia, Bagozzi, and Pearo (2004) and Okazaki (2008). Concerning the operationalization of both psychographic constructs, i.e., purposive value and entertainment value, we addressed the consumers’ characteristics to identify the consumers who place high importance on the purposive value of messages in general. We analyzed the consumer’s characteristics concerning both constructs, i.e., the importance of the purposive value and the entertainment value for respondents. Items were measured on a seven-point Likert scale, using scale points from “do not agree at all” (1) to “totally agree” (7). We operationalized the “usage intensity” by surveying the number of text messages each participant wrote per day (see Appendix A for details).

To measure consumers’ social networks, we surveyed their egocentric networks (Burt 1984; Fischer 1982; McCallister and Fischer 1978; Straits 2000). Egocentric networks are defined as the direct relationships between an individual consumer (or ego) and other consumers (or alters) and the relationships that exist between the alters. These are small networks of one focal actor called the “ego”, the participant in the survey, and his or her contacts, called “alters”. The difference between a regular network and an egocentric network is that in the latter, all of the necessary information is obtained from one actor, which makes it a feasible method for obtaining samples that are representative of a large-scale population. To access the respondents’ core networks, we used the term “generator,” which was taken from Burt (1984), and adapted it to the specific characteristics of this study (see Appendix A for details). The participants first generated their list of alters by identifying their most frequent contacts and were then asked a series of questions, which helped us to gain additional insights in their social network, including the strength of the relationship with each contact. Because each egocentric...
network is calculated based on information from a single respondent, such networks are usually treated as undirected. Based on this information, we calculated the degree centrality, which is the number of ties for a node, and average tie strength for each network. Marsden (2002) showed that the egocentric centrality measures are generally good proxies for sociometric centrality measures.

**Model**

The model consists of a funnel of three successive decisions: (i) reading the message, (ii) visiting the homepage (interest) and (iii) forwarding the message (decision to refer). In each stage, the number of observations diminishes because only consumers who took action in the last stage can take another action in the next stage, i.e., only consumers who read the message can access the homepage. Fig. 1 shows that the model is hierarchical, nested, and sequential, which leads to desirable statistical properties. Therefore, we use Maddala’s (1983, p 49) sequential response model, which is also known as a model for nested dichotomies (Fox 1997). We follow the argumentation of De Bruyn and Lilien (2008), who adapted a model of Maddala (1983, pp 49) to the context of consumer decision-making (see Appendix B for our model). We fit the model by simultaneously maximizing the likelihood functions of the three dichotomous models in Stata 12. Each likelihood function incorporates the estimated probabilities of the preceding stages.

De Bruyn and Lilien (2008) argued that consumers do not drop out at random in this process because it is a process of self-selection, which may raise statistical concerns. However, the parameter estimates for the structure of the model used in this paper have been shown to be unaffected by changes in the marginal distributions of the variables (Bishop, Fienberg, and Holland 1975; Mare 1980).

**Results**

**Descriptive Statistics and Bias Tests**

In all, 943 subjects responded to the survey. Of these, 634 read the initial message (reading), 440 visited the homepage (interest) and 144 consumers forwarded the message (decision to refer). Table 1 shows the correlations and descriptive statistics among the variables in this study.

First, we compare the demographic characteristics of the survey respondents with the demographic characteristics of the entire customer sample. Of the 943 survey respondents, 28% are female, which is in line with the entire sample. In addition we observed the age distribution of the survey respondents as well as the entire customer sample and found that the groups are essentially consistent (see Table 2).

Second, we compared consumers who read the text message \( N_{\text{read}} = 634 \) with those who did not read the initial text message \( N_{\text{nonread}} = 309 \) with respect to their surveyed demographics and cell phone usage behavior. We found no significant difference between the groups for demographics (female: \( M_{\text{read}} = 27.0\% \), \( M_{\text{nonread}} = 30.1\% \), \( p > .31 \); age: \( M_{\text{read}} = 29.2 \text{ yrs} \), \( M_{\text{nonread}} = 30.6 \text{ yrs} \), \( p > .06 \)), monthly cell phone usage (\( M_{\text{read}} = 29.28 \text{ €} \), \( M_{\text{nonread}} = 29.62 \text{ €}, p > .95 \)) or age and gender.

**Three-stage Decision-making Model**

We include all explanatory variables in the estimation of every stage to avoid an omitted variable bias. Table 3 shows the results of our sample selection model.

**Entertainment Value and Purposive Value (H1 and H2)**

We find significant influence concerning consumers who place high importance on the entertainment value of exchanging mobile

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Fig. 1. Consumers’ decision-making process in the viral campaign.
text messages with regard to the reading stage (coefficient: .116/H1a), the interest stage (coefficient: .181/H1b) and the decision to refer stage (coefficient: .204/H1c). Furthermore, we find a significant increase in the likelihood of entering the interest stage (coefficient: .167/H2b) as well as the decision to refer stage (coefficient: .600/H2c) for consumers who place high importance on purposive value. However, no support can be found for H2a.

Overall, consumers who place higher importance on the entertainment value of exchanging text messages and who place higher importance on the purposive value demonstrate an increased likelihood of entering the interest and decision to refer stages.

Usage Intensity (H3)

Our results show that the influence of usage intensity on the decision to refer a mobile text message is only significant at the 10% level (coefficient .010/H3). Thus, consumers who are used to writing mobile text messages are more likely to forward mobile text messages as well as the advertising text message. This result is consistent with previous findings that usage intensity is positively related to user behavior (Gatignon and Robertson 1991).

Tie Strength (H4)

Our results support H4: Tie strength significantly decreases the likelihood that consumers decide to send and forward a mobile text message (coefficient: -.461/H4). Thus, lower levels of tie strength increase the likelihood of the decision to send advertising text messages. A previous study found that the receivers of unsolicited e-mails tend to pay more attention to messages from close contacts (i.e., high-quality contacts) (De Bruyn and Lilien 2008). However, their study focused on consumers who are actively searching for relevant information and are thus receivers of information. In contrast, the present study addresses mobile advertising text messages that are sent from a consumer to the consumer’s contacts without being solicited. In other words, we focus on the sender of the message. The difference between the sender and the receiver of a message provides a solid explanation for the differences in the results between the two studies. Further, we find a negative influence of tie strength on the likelihood to read the message, which may be explained by the low tendency of consumers with strong tie relationships to read firm-initiated text messages.

To gain deeper insight into the negative impact of tie strength on the decision to forward a message, we conduct an additional analysis and find that the average tie strength between senders and receivers of forwarded messages is 2.99. This tie strength is significantly less than the average tie strength on the decision to forward a message, we conduct an additional analysis and find that the average tie strength between senders and receivers of forwarded messages is 2.99. This tie strength is significantly less than the average tie strength on the decision to refer (coefficient: .204/H1c). Thus, lower levels of tie strength significantly decrease the likelihood of the decision to refer.

Degree Centrality (H5)

In testing H5, we focus on the influence of degree centrality on the decision to refer and find that the number of contacts (i.e., degree centrality) has no influence on the decision to refer. Thus, H5 is not supported.

In addition to testing the hypotheses, we examine the influence of gender on each stage of the decision-making process. The results show that gender has a significant influence only on the interest stage (coefficient: .580). No significant influence of gender is identified for the reading or decision to refer stages. Further, we test the effect of age in the decision-making process. The results show that age has a significant influence on the decision to refer stage (coefficient: .036).

Table 1
Descriptive statistics.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mean</th>
<th>StD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Entertainment value</td>
<td>4.19</td>
<td>1.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Purposive value</td>
<td>3.81</td>
<td>2.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Usage intensity</td>
<td>7.53</td>
<td>19.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Tie strength</td>
<td>3.10</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Degree centrality</td>
<td>3.04</td>
<td>1.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Age</td>
<td>29.69</td>
<td>11.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: means, standard deviations and correlations, N = 943. ** p < .05.

Table 2
Demographics of survey respondents and the entire customer sample.

<table>
<thead>
<tr>
<th>Age</th>
<th>Percentage Survey respondents</th>
<th>Percentage Entire customer sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td>20–29</td>
<td>37%</td>
<td>36%</td>
</tr>
<tr>
<td>30–39</td>
<td>22%</td>
<td>28%</td>
</tr>
<tr>
<td>40–49</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>50–59</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>≥60</td>
<td>1%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Table 3
Results of the three-stage model.

<table>
<thead>
<tr>
<th>Stage: Reading</th>
<th>Stage: Interest</th>
<th>Stage: Decision to refer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>SE</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Entertaiment value</td>
<td>.116**</td>
<td>.054</td>
</tr>
<tr>
<td>Purposive value</td>
<td>.062</td>
<td>.045</td>
</tr>
<tr>
<td>Usage Intensity</td>
<td>-.003</td>
<td>.003</td>
</tr>
<tr>
<td>Tie strength</td>
<td>-.219**</td>
<td>.094</td>
</tr>
<tr>
<td>Degree centrality</td>
<td>-.021</td>
<td>.050</td>
</tr>
<tr>
<td>Age</td>
<td>-.012*</td>
<td>.006</td>
</tr>
<tr>
<td>Gendera</td>
<td>.098</td>
<td>.160</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.069</td>
<td>.461</td>
</tr>
</tbody>
</table>

n = 943

Log likelihood = 1174.81
Wald chi² = 180.58
Prob > chi² = <.01

* Dummy coding (0 = female, 1 = male).
** p < .10.
* * p < .05.
Discussion

This paper develops a three-stage model to analyze the decision-making process of consumers in mobile viral marketing campaigns. This is an important area to study because companies actively approach only a small number of consumers in viral marketing campaigns. Therefore, additional information about these consumers, their decision-making processes and the factors that influence the consumers may help determine the success or failure of viral marketing campaigns. Only a few extant studies focus on mobile viral marketing campaigns. Due to the increased use and penetration rate of cell phones and smartphones, most consumers can be addressed via this new medium and channel. Furthermore, cell phones combine unique characteristics such as ubiquitous computing, always on and immediate reactions, thus making mobile phones an attractive marketing channel for viral marketing campaigns.

The three-stage model approach allows us to gain a deeper understanding of consumers’ decision-making processes in mobile viral marketing campaigns. This study has produced several key findings.

The first key finding is the important role of consumers who place high importance on the purposive value and entertainment value of a message during the decision-making process. We find that the entertainment value significantly influences all three stages. Purposive value significantly influences the interest stage and the decision to refer stage, but it does not influence the reading stage. This finding is relevant when conducting a mobile viral marketing campaign. To attract customer attention, and thus to successfully pass the reading stage, companies should develop campaigns that entertain customers. To have a significant influence on the decision to refer, it is important to address consumers who place importance on both purposive and entertainment value. However, Dholakia, Bagozzi, and Pearo (2004) found that in online communities, purposive value has no direct effect on participation behavior. The differences between their results and our results can potentially be attributed to the differences between online technology and cell phones. We suggest that purposive value is mobile-specific because the mobile setting differs from the Internet. People tend to spend a considerable amount of time in online communities and therefore have potentially large amounts of content to read. This makes it difficult to identify the content that may be meaningful to the contacts. On the contrary, at least to date, customers receive a limited amount of mobile text messages. Thus, the purposive value can be judged, and if customers believe that the text message is useful and has purpose, they will be interested in it and will eventually decide to forward it.

We find that tie strength plays an important role in the last stage of the decision-making process and has a negative influence on both the reading stage and the decision to refer stage. In other words, consumers are more likely to pass messages on to weak ties (i.e., low-quality contacts). Further, usage intensity has a positive influence at the 10-percent level, which indicates that heavy users may be influential in mobile viral marketing campaigns because they have a lower threshold to pass information to their contacts. Thus, heavy users are more influential because of their communication habits. An interesting finding is that degree centrality has no influence on the decision-making process.

Our results indicate that one reason for the failure of mobile viral marketing campaigns is that consumers tend to forward messages to consumers on whom they have limited impact. Consumers with low-quality contacts (i.e., weak ties) are more likely to forward the message because the perceived risk, which can include social sanctions, of forwarding a message is low. Accordingly, the results of this study indicate a behavior that might limit the impact of viral campaigns. Specifically, customers who predominantly possess weak ties are more likely to read the message, and they are more likely to pass it on to other customers with predominantly weak ties. In contrast, the receivers of the message tend to make their purchase decisions based on the content that they receive from high-quality (i.e., strong tie) contacts because such ties are perceived to be more trustworthy when making a purchase decision (Rogers 1995). Thus, the viral process may lead to a high number of referrals that are ignored by their receivers, thus potentially limiting the success of the campaign. Future research should therefore examine the circumstances under which consumers make their purchase decisions and the products that they choose based on recommendations from strong and weak ties.

This study has several limitations that open additional avenues for future research. First, because of our setting and because we conducted a viral marketing campaign in a mobile environment via text messages, we were not able to directly observe the referrals made. In our study, this variable is self-reported via a survey, which is a limitation of the study. Further research should conduct an experimental setting where it is possible to observe the forwarding behavior using behavioral data rather than survey data. Second, the participants of this study were members of an opt-in program and had already agreed to receive mobile advertising text messages for advertising reasons. Therefore, it remains unclear how consumers who have not consented to receiving messages would react to unsolicited mobile advertising messages. Third, mobile marketing is still an emerging field in comparison to e-mail marketing. Therefore, it is likely that consumers will pay attention to these (mobile marketing) campaigns because they are rather novel. It remains to be seen how these results may change with the increasing prevalence of mobile marketing campaigns in the future. Fourth, we studied only one product category, a new music CD. Future research should analyze what products or services are (more or less) suitable for mobile viral marketing campaigns. Fifth, in this study, we only focused on data from the responses of consumers who were seeded by the company. To further generalize the results, future research could also analyze consumers who receive a message from a friend. Finally, we only analyzed mobile viral marketing via text messages. Future studies could analyze and compare the findings with mobile viral marketing campaigns using media-rich formats such as multimedia messages because these formats can offer more entertaining content to recipients.
Appendix A. Measurement Scales

<table>
<thead>
<tr>
<th>Scales</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entertainment value</td>
<td>I want to entertain my friends by sending enjoyable information. Information exchange is fun by itself. It is a good way to spend time in an enjoyable way.</td>
</tr>
<tr>
<td>Purposive value</td>
<td>I feel like spreading information I have discovered to my friends. I want to send information to my friends who may be interested in it.</td>
</tr>
<tr>
<td>Usage intensity</td>
<td>Number of mobile text messages each survey participant wrote per day.</td>
</tr>
<tr>
<td>Network items</td>
<td>Degree centrality (=number of contacts the respondent names): Looking back over the last six months, who are the people with whom you discussed an important personal matter? Please write their first names or initials in the boxes below. Tie strength: How close do you feel to these people?</td>
</tr>
</tbody>
</table>

Note: Items for entertainment value & purposive value on seven-point Likert scale. Tie strength measured on five-point Likert scale.

Appendix B. Sequential Logit Model Specification

Consider the following model (cf. De Bruyn and Lilien 2008):

\[ Y = 1 \] if the recipient has not read the text message.

\[ Y = 2 \] if the recipient has read the text message but has not visited the website.

\[ Y = 3 \] if the recipient has visited the website but has not forwarded the message.

\[ Y = 4 \] if the recipient has forwarded the message.

The probabilities can be written as follows (Amemiya 1975):

\[ P_1(Y = 1) = F(\beta_1'x) \]
\[ P_2(Y = 2) = [1 - F(\beta_1'x)]F(\beta_2'x) \]
\[ P_3(Y = 3) = [1 - F(\beta_1'x)][1 - F(\beta_2'x)]F(\beta_3'x) \]
\[ P_4(Y = 4) = [1 - F(\beta_1'x)][1 - F(\beta_2'x)][1 - F(\beta_3'x)]. \]

The parameters \( \beta_1 \) are estimated for the entire sample by dividing the sample into those who read the text message and those who did not. The parameters \( \beta_2 \) are estimated from the subsample of recipients who read the text message by dividing it into two groups: those who visited the website and those who did not. The parameters \( \beta_3 \) are estimated from the subsample of recipients who visited the website by dividing the subsample into two groups: those who forwarded the message and those who did not.

The likelihood functions for the above sequential logit model can be maximized by sequentially maximizing the likelihood functions of the three dichotomous models (De Bruyn and Lilien 2008; Maddala 1983).

References


Intentsions Across the Different Stages of the Buying Process,” Journal of Interactive Marketing, 21, 2, 26–41.


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**Philipp Reichhart**: Research interests include e- and m-commerce, mobile marketing, consumer behavior, word of mouth, social network and location-based services.