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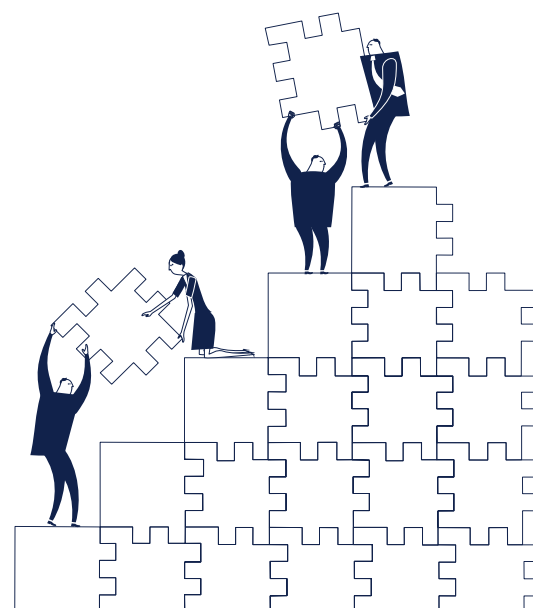
Spillover Effects In Seeded Word-Of-Mouth Marketing Campaigns

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Spillover Effects In Seeded Word-Of-Mouth Marketing Campaigns

Abstract

Seeded marketing campaigns (SMCs) involve firms sending product samples to selected customers and encouraging them to spread word of mouth (WOM). Prior research has examined certain aspects of this increasingly popular form of marketing communication, such as seeding strategies and their immediate efficacy. Building on that research, this study investigates the effects of SMCs extending beyond the generation of WOM for a campaign's focal product by considering how seeding can affect WOM spillover effects at the brand and category levels. The authors introduce a framework of SMC-related spillover effects, and then empirically estimate these with a unique dataset covering 390 SMCs for products from 192 different cosmetics brands. Multiple spillover effects are found, suggesting that while SMCs can indeed be used primarily to stimulate WOM for a focal product, marketers must also account for brand- and category-level WOM spillover effects. Specifically, product seeding increases conversations about that product among non-seed consumers, and, interestingly, decreases WOM about other products from the same brand and about competitors' products in the same category as the focal product. These findings indicate that marketers can use SMCs to focus online WOM on a particular product by drawing consumers away from talking about other related, but off-topic, products.

Keywords: Word-of-Mouth, Seeded Marketing Campaigns, Social Media, Spillover Effects, Viral Marketing.

1. Introduction

Consumer-to-consumer word-of-mouth (WOM) communications are widely believed to have a powerful influence on consumer behavior. Previous studies have shown that WOM shapes consumer expectations and pre-usage attitudes (Anderson 2003; Herr, Kardes and Kim 1991), affects choice and purchase decisions across a variety of product categories (Arndt 1967; Berger and Schwartz 2011; Chevalier and Mayzlin 2006; Godes and Mayzlin 2004; Whyte 1954), changes post-usage perceptions of products (Bone 1995), and improves customer acquisition, retention, and sales (Kumar, Petersen, and Leone 2010; Libai et al. 2010; Sonnier, McAlister, and Rutz 2011; Stephen and Galak 2012; Trusov, Bucklin, and Pauwels 2009; Villanueva, Yoo, and Hanssens 2008). Further, with the increasingly widespread use of social media, including online discussion forums and online review platforms, firms have taken a greater interest in finding ways to generate and leverage consumer-to-consumer WOM to help achieve their marketing objectives.

A popular approach among firms for generating product-related WOM is through *seeded marketing campaigns* (SMCs), which are sometimes also referred to as buzz, evangelist, influencer, sampling, or viral marketing campaigns. Typically, an SMC involves a firm seeding a focal product with selected consumers (e.g., by sending them samples) and asking those consumers to generate WOM about that product. Although WOM can take many forms and thus occur in a large number of contexts, it is increasingly common for firms to ask seeded consumers to generate WOM about the focal product in the form of posts to online forums or social media websites, or as reviews on retail websites. SMCs have become increasingly popular among firms of all sizes over recent years. For example, a recent industry study by the American Marketing Association and the Word of Mouth Marketing Association reports that one-third of marketers

either have run or plan to run campaigns in which samples are seeded with customers, and three-quarters either have used or plan to use consumers to start spreading WOM (WOMMA 2014). This form of firm-encouraged, consumer-to-consumer WOM is referred to as “amplified” WOM and is distinct from “organic” WOM, which occurs naturally without direct firm involvement (Libai et al. 2010).

Prior research on amplified WOM marketing programs (and SMCs more specifically) focuses predominantly on questions related to brand characteristics (i.e., what brands are more likely to generate WOM or information sharing), target characteristics (i.e., whom should firms select as seeds), incentives (i.e., how can seeds be implicitly and explicitly encouraged), and brand outcomes (i.e., what types of consumer behaviors are influenced). For example, Lovett, Peres, and Shachar (2013) study talked-about brands and connect their characteristics to social, emotional, and functional drivers of WOM. Hinz et al. (2011) examine various strategies for selecting seeds and find that the best seeds are often consumers with high levels of social connectivity. Godes and Mayzlin (2009) find that the most loyal existing customers might not be ideal seeds because their friends (to whom they would transmit WOM) are more likely to also be customers. Libai, Muller, and Peres (2013) show how WOM outcomes combine acceleration and expansion components to generate value. Lastly, a rich literature studies incentive mechanisms for generating WOM-based customer referrals (e.g., Biyalogorsky, Gerstner, and Libai 2001; Kornish and Li 2010; Ryu and Feick 2007; Stephen and Lehmann 2015), and Schmitt, Skiera, and Van den Bulte (2011) examine the value of customers acquired WOM referral programs.

Despite the rich literature on WOM marketing and SMC-related topics specifically, prior research tends to focus on either the immediate effects of SMCs on amplified WOM transmissions for a campaign’s focal product, or how best to design an SMC (e.g., selecting “optimal” seeds). Critically, the broader consequences of running an SMC have received scant

attention. Given that it is well established that WOM about a focal product can be triggered or amplified by seeded conversations, it is conceivable that WOM on topics related to but different from a focal product might also be affected. For example, an SMC for Chanel lipstick in which seed consumers receive a sample product and post reviews about that product in an online community might affect the amount of WOM generated in that community about *other* Chanel products (i.e., spillover effects with respect to WOM about the same brand's products in other categories) and/or about competing products (i.e., spillover effects with respect to WOM about other brands' products in the same category). In addition to brand- and category-related spillover effects, WOM about a focal product among consumers in one segment could spill over to affect WOM among consumers in other segments. For example, although an SMC for Chanel lipstick might target specialist or expert cosmetics users (and select seeds from this segment), WOM generated by members of this segment could also influence WOM among consumers in other segments, such as more generalist or novice cosmetics users.

Although seeding has gained recognition as a key marketing communication tool, research on the types of WOM spillovers described here is limited. Two streams of prior research do, however, suggest in general that WOM spillovers (e.g., brand and category spillovers) are possible. First, diffusion research considers models with within- and cross-brand influence on new product diffusion processes (Libai et al. 2009), WOM externalities (Peres and Van den Bulte 2014), and indirect effects on brand-level diffusion due to category-level sales (Krishnan, Seetharaman, and Vakratsas 2012). Second, qualitative research by Kozinets et al. (2010) finds that firm-initiated attempts to generate WOM in online communities by targeting prominent bloggers can also affect online conversations among the general population. This suggests that WOM among one consumer segment can spill over into other consumer segments (e.g., from

“expert” bloggers to the general population). Taken together, these streams of research suggest qualitatively and theoretically that WOM spillovers from SMCs exist.

Building on these findings, the current research examines how SMCs trigger a comprehensive set of WOM spillover effects with respect to a focal product, products from the same brand but in different categories, and competing products from different brands in the same category. The latter two spillover effects represent indirect, probably unintended, and potentially unfavorable consequences of a firm’s decision to use an SMC for a focal product. Such effects could occur because observing WOM about a focal product could cue thoughts about other related topics, such as the brand and the category, and these thoughts could affect the generation of WOM that is not focused on the focal product in a way that brands want (e.g., Alba and Chattopadhyay 1985, 1986). Also, WOM generation among one segment of consumers could trigger a WOM spillover from that segment into another, which is consistent with the two-step flow of communication model (e.g., Katz and Lazarsfeld 1955), the concept of market mavens (e.g., Feick and Price 1987), and notions of “influentials” versus “imitators” in the diffusion of innovations literature (e.g., Rogers 1995; Van den Bulte and Joshi 2007).

In sum, this research addresses two research questions: (1) What types of WOM spillover effects are triggered by seeding? And (2) What is the nature of these effects (positive, negative), and how large are they? To address these questions, we develop a typology of WOM spillover effects and then empirically identify multiple spillover effects using a unique dataset of 390 SMCs for products across 192 different cosmetics brands. This research fills an important gap in the literature on SMCs and firm-encouraged WOM by considering the possibility that conversations triggered by seeding a focal product can affect conversations about related but off-topic, non-focal products from either the same brand as the focal product or competitors. Despite their potential importance, such effects have not been studied in prior SMC-related research.

2. Types of Word Of Mouth Spillover Effects

Before introducing our conceptual framework, we introduce a typology of WOM spillover effects that could be triggered by firms' SMC-initiating seeding actions. For the purposes of this typology and the subsequent conceptual framework, we distinguish between two types of WOM based on the consumer source: seed and non-seed. Seed WOM is generated by a campaign's seed consumers; i.e., those who are selected by the firm, typically sent product samples, and expected to initiate conversations. Non-seed WOM is generated by all other consumers; i.e., those who are not selected as seeds.

The distinction between seed and non-seed WOM is important because we define WOM spillover effects as the positive or negative influence of seed WOM about an SMC's focal product on non-seed WOM about the focal product, the corresponding brand, or other products or brands in the category.¹ As this definition suggests, we consider three specific types of WOM spillover effects that can arise from an SMC for a focal product:

1. *Focal product spillovers.* WOM generated by non-seed consumers about the focal product. For example, in an SMC for Chanel lipstick, a focal product spillover would be non-seed WOM about Chanel lipstick;
2. *Brand spillovers.* WOM generated by non-seed consumers about products from the same brand as the focal product, but not about the focal product. For example, in an SMC for Chanel lipstick, a brand spillover would be non-seed WOM about Chanel nail polish;

¹ Seed and non-seed WOM in this context is WOM activity that is directly or indirectly triggered by the SMC. Of course, so-called "organic" WOM that is not a consequence of SMC-related actions by firms can coexist. Although not theoretically the focus of this research, as described later, we do attempt to empirically control for this.

3. *Category spillovers.* WOM generated by non-seed consumers about products from the same category as the focal product, but not about the focal product or its brand. For example, in an SMC for Chanel lipstick, a category spillover would be non-seed WOM about Revlon lipstick.

Further, each of these WOM spillover effects can occur either within or between consumer segments. Within-segment spillovers occur among consumers who are in the same segment as the seed consumers. Between-segment spillovers are, on the other hand, those in which consumers in a different segment to the seeds are influenced and generate WOM. For example, if a firm selects seed consumers who are heavy category users (as is often the case), within-segment spillover effects would involve the generation of non-seed WOM by consumers who are also heavy users of products in that category. Conversely, between-segment spillover effects would involve the generation of non-seed WOM by consumers who are not heavy users of products in that category.

For the purposes of our empirical analysis, we consider a setting with two segments, which we refer to as specialists (e.g., experts, heavy users, early adopters) and generalists (i.e., everyone else). Firms usually select seeds from a specialist segment (WOMMA 2005),² and this is the case in our empirical setting. Thus, within-segment spillovers are those where seed WOM affects non-seed WOM among specialists, and between-segment spillovers are those where seed WOM affects non-seed WOM among generalists. Note, in the case of between-segment spillovers, that it is plausible that the effect of seed WOM on non-seed WOM will be indirect, in the sense that seed WOM may first influence non-seed WOM among specialists (within-segment), which will then influence non-seed WOM among generalists (between-segment),

² Firms typically seed with specialists (e.g., advocates, enthusiasts, experts, influentials, innovators, or mavens) because firms believe that specialists are more intrinsically motivated to participate in SMCs by generating WOM, more credible, and more receptive to extrinsic motivators (i.e., incentives) such as free product samples.

consistent with two-step flows of communications (Katz and Lazarsfeld 1955) and cross-segment diffusion (e.g., Rogers 1995; Van den Bulte and Joshi 2007). While our conceptualization in the next section primarily focuses on focal product, brand, and category spillover effects in general and does not specifically distinguish between within- and between-segment effects, for completeness and because our data allows for it, we incorporate these effects in the empirical analysis reported later.

3. Conceptual Framework

3.1 Focal Product Spillover Effect

Marketers have long recognized that consumers often share and spread product-related information over social ties (e.g., see Van den Bulte and Wuyts 2007 and Hinz et al. 2011 for reviews of social contagion and seed/viral marketing). We expect that when seed consumers spread focal product WOM, the non-seed consumers exposed to this information will become more likely to generate non-seed WOM about the focal product; i.e., a positive focal product spillover effect. For the most part, this is a primary goal of an SMC; i.e., the seeds getting non-seeds to generate WOM (or “buzz”) about the focal product.

This positive focal product spillover effect is expected to occur for a number of related reasons. First, non-seed consumers may be prompted to talk about the focal product because the seed WOM piques their interest and curiosity, and non-seeds use their own WOM to discuss what is essentially an uncertain product so that they can obtain additional information to resolve their uncertainty. Second, consistent with Watts and Dodds (2007), non-seeds exposed to seed WOM about a focal product may be susceptible to influence and thus made more likely to generate WOM themselves. Finally, when exposed to seed WOM about a focal product, non-

seeds (particularly specialists) might feel a need to contribute their own opinions to the burgeoning conversation for self-presentation or self-enhancement reasons, such as signaling expertise or reputation (e.g., Wojnicki and Godes 2008). For these reasons, we expect that seed WOM will positively impact non-seed WOM about a focal product.³ Stated formally:

H1: Seed WOM about an SMC's focal product will lead to increased non-seed WOM about the focal product (i.e., positive focal product spillover effect).

3.2 Brand and Category Spillover Effects

The potential for marketing activity for a focal product to affect consumers' actions related to other products from the same brand as the focal product (i.e., brand spillover effects) and products under different brands from the same category as the focal product (i.e., category spillover effects) is generally supported by prior research. For example, Balachander and Ghose (2003) find reciprocal spillover effects from brand extensions, Libai et al. (2009) identify positive cross-brand adoption effects, and Lewis and Nguyen (2014) find that online display advertisements increase online search activity for competitors' brands. Generally speaking, prior research on spillover effects across a variety of marketing contexts indicates a tendency for such effects to be positive. The logic is fairly straightforward: firms' marketing efforts or promotional messages about a focal product could cue thoughts about higher-level or broader concepts that are related to a focal product but that open up the possibility of thinking about other products (Berger and Schwartz 2011). Similarly, applying this logic to our context of SMCs and, specifically, seed WOM about a focal product, non-seed consumers being exposed to WOM about a focal product (e.g., Chanel lipstick) conceivably could trigger higher-level thoughts

³ We also note that this is generally consistent with well-established findings on the two-step flow of communications model (Katz and Lazarsfeld 1955) and two- or multi-stage diffusion models involving new product adoption spreading from "influentials" to "imitators" (e.g., Rogers 1995; Van den Bulte and Joshi 2007; Watts and Dodds 2007).

about the brand (e.g., Chanel) that lead consumers to be more likely to generate buzz about other products from that brand (e.g., Chanel perfume) as well as other products in the same category from competitors (e.g., Lancôme lipstick) either instead of or in addition to the focal product.

For SMCs and online WOM, however, we do not expect to find these types of positive spillover effects. Instead, we expect to find the opposite—negative brand and category spillover effects whereby non-seeds are less likely to generate WOM about related same-brand and same-category products after being exposed to seed WOM about the focal product. This is because, in this context, the nature of the initial mentions of or discussions about the focal product by the seeds is likely to be substantially more focused on and specific to the focal product as a result of the typical practice of selecting “specialist” consumers to be seeds. Put simply, the initial WOM from seeds that “kicks off” subsequent conversations among non-seeds is expected to be more focused on specifics of the focal product (and thus more “on topic”). Accordingly, we anticipate that by being exposed to such narrowly construed seed WOM, non-seeds will be less likely to stray to topics that are related to but not specifically about the focal product. In other words, very focused and specific focal product WOM by seeds in the SMC context will serve to constrain the context for the ensuing conversation among non-seeds in both the specialist and generalist segments, and thus non-seed WOM about related same-brand and same-category non-focal products will be less prevalent.

Unlike the previously mentioned positive brand and category spillover effects where exposure to products can prime higher-level associations across a brand or a category, specialist seeds who start online conversations are expected to reduce the possibility of off-topic conversations by being relatively more focused in their communications. Further, not only will focused seed WOM about the focal product help to constrain the “topic space” for non-seed WOM, its ability to mitigate off-topic brand and category WOM (i.e., avoid positive spillovers)

may also be because seeds—who tend to be experts or specialists, and therefore more credible and potentially influential—signal to non-seeds the most important conversation topics (i.e., aspects of the focal product) and, by omission, the topics that are not important (i.e., other products from the same brand or category). Prior research suggests that the tendency for specialist consumers (including seeds in SMCs) to have above-average product expertise makes them more likely to process information with increasingly specific categorizations (Sujan and Dekleva 1987). Thus, even though the focal product’s brand and category will be mentioned in seed WOM, the highly product-focused and more detailed nature of specialist WOM is expected to mitigate the tendency for their WOM to trigger higher-level thoughts about the brand and the category, and draw non-seeds away from higher-level representations and ideas. This is also consistent with prior research suggesting that increasing the salience of a particular topic (e.g., a focal product) can lead to inhibited recall of competing topics (Alba and Chattopadhyay 1986). Based on the above discussion, we advance the following hypotheses:

- H2: Seed WOM about an SMC’s focal product will decrease non-seed WOM about other products from the same brand as the focal product.
- H3: Seed WOM about an SMC’s focal product will decrease non-seed WOM about products from other brands in the same category as the focal product.

4. Data

4.1 Overview

We now turn to empirically testing our hypotheses using a large and unique consumer WOM dataset from one of the largest Internet portal sites in South Korea, *Naver*, which has almost 80% market share in South Korea (The Economist 2014). Although *Naver* has many

features (including South Korea's most popular search engine), the feature we focus on is the discussion forums and, within that, the product-related forums in which consumers share product-related opinions and reviews. Similar to English-language portals that host online forums (e.g., Yahoo), *Naver's* forums have tree-like (or threaded) discussion structures such that discussions on related topics are grouped together. Specifically, in the product-related discussion forums, forums are organized around broad product types.

Our data covers product-related discussion forums for cosmetics products. We chose this industry as the study's focus for several reasons. First, in *Naver*, cosmetics are one of the most prominent product types in terms of product-related discussion forum activity and, importantly, firm-initiated SMCs. Second, it is generally common for firms to use SMCs with product sampling to promote cosmetics products. Third, the South Korean cosmetics industry is large (2012 sales of 1.3 trillion Won, or approximately US\$1.3 billion) and growing at a 7.7% compound annual rate (Euromonitor 2013). Fourth, the cosmetics industry has features that allow us to identify both the brand and category spillover effects of interest because it has many brands that offer products across multiple categories (e.g., lipstick, nail polish, makeup). Finally, consumers are more likely to search for product reviews for cosmetics due to high levels of product diversity and the fact that cosmetics products are experience goods.

In addition to the standard hierarchical organization of product-related conversations, a unique feature of *Naver's* forums, which we exploit in order to identify spillover effects separately for specialist and generalist consumer segments, is that cosmetics product-focused forums are divided into two types. The first type, called "Online Café," is a membership-only forum for specialist consumers. Independent community managers (who are not employees of *Naver*) regulate membership and require members to demonstrate high levels of engagement through active participation in discussions. For example, in one of the "Online Café" forums in

our dataset, members must write at least 20 product-related posts and submit at least three product reviews per month to retain their membership. Membership confers posting rights in members-only forums (i.e., non-members of Online Café forums can read but not write posts) and, importantly, makes one eligible to be selected as a seed in firm-initiated SMCs for cosmetics products. Thus, all members of product-related discussion forums of this type are considered to be specialists. The second type of forum, called “Knowledge In,” does not have any membership requirements, which therefore allows for anyone to write posts. Consumers posting on this forum, therefore, are considered to be generalists. These consumers can read posts by specialists in the Online Café forums but not write posts; they can only write posts in their own Knowledge In forums.

4.2 Seeded Marketing Campaigns for Cosmetics Products on *Naver*

Firms use only the specialist forums (i.e., Online Café) for seeding products with specialists. This means that a consumer must be a specialist in order to be selected as a seed in a campaign. The standard SMC procedure followed by all firms on this platform is as follows:

1. The firm initiates an SMC by sending a campaign request to a forum’s community administrator, who is an independent “super member” of the forum. The request includes a description of the product, the number of seeds to be recruited (the average number is approximately 25 per SMC), a timeline for the physical delivery of the samples to seeds, and a timeline for when seeds are expected to post product opinions and reviews (i.e., seed WOM) on the campaign’s specialist forum.
2. The community manager posts an announcement on the specialist forum that invites members to apply to be a seed for a particular campaign.

3. Seeds are selected randomly⁴ from the applicant pool, and samples are shipped.
4. Seeds receive samples and are asked⁵ to test the products and post reviews in the designated SMC section of the forum, typically within 2-3 weeks. Seeds' reviews tend to be very thorough and often include their detailed opinions, descriptions of their experiences with the product, "before and after" photos (e.g., before and after a skincare treatment), and details on how products can be used.

Following our typology of spillover effects in §2, a review posted by a seed in a specialist forum is considered to be an instance of focal product seed WOM. Then, once seeds begin to post their reviews and opinions, non-seed WOM-generation activity starts among both specialists and generalists. The following actions correspond to the spillover effects described earlier:

- *Focal product non-seed WOM by specialists.* Other, non-seed specialists may contribute posts to the conversation in their own board (seeds' reviews are in a separate board). These can include product reviews, recommendations, videos, and photos.
- *Focal product non-seed WOM by generalists.* Non-members of the specialist forum cannot post in the specialist forum, although—importantly—they can read posts in the specialist forum. Non-members can, however, post in corresponding product-related boards in the generalist forum. Thus, they can be exposed to focal product seed and non-seed WOM by specialists (acquiring information from and being influenced by specialists) and then disseminate this information, as well as their own opinions, in the relevant product-related discussions in the generalist forum.

⁴ Administrators randomly select seeds. They do, however, make small adjustments to ensure that seed opportunities are available approximately equally for all (active) members over time.

⁵ While seeds have the option of not complying (i.e., not posting reviews), they are very likely to comply because non-compliance can disqualify them from being a seed in the future.

- *Same-brand and same-category non-seed WOM by specialists and generalists.*

Non-seed WOM that does not mention the focal product but mentions either the same brand (but products in different categories) or the same category (but competing brands) can occur as posts in either specialist or generalist forums.

4.3 Data Collection

Our data comes from *Naver*'s cosmetics forums and covers a 46-month period (February 2008 to November 2011).⁶ The data were collected as follows. First, we obtained a list of all products that were focal products in SMCs in the three largest specialist (Online Café) cosmetics forums. Second, we associated brand names and category names with each product. Third, we collected all focal product seed and non-seed WOM corresponding to these SMCs in the specialist forums. Fourth, we collected all focal product non-seed WOM corresponding to these SMCs in the generalist forums. Fifth, for the same time periods as the SMCs, we collected all posts in specialist and generalist communities that mentioned a focal product's brand or category (i.e., same-brand and same-category non-seed WOM by specialists and generalists). We also obtained data (for use as control variables) on the seeds' reviews (numbers of images, numbers of words), and whether the seed was designated as a "top reviewer" (indicated by a publicly observable icon beside their name; top reviewers are the top-10% most active reviewers). Note that we excluded products that had seed WOM but no non-seed WOM, as well as products that were promoted with more than one SMC at the same time (since resultant non-seed WOM in that case cannot be attributed to a single SMC).⁷

⁶ These forums are typically very large in terms of membership. For example, our data focuses on the largest three "Online Café" forums for cosmetics, and the average number of members is 153,761.

⁷ Sixty-six products from 37 brands were excluded on this basis. These products came from a variety of brands and categories, distributed across categories similarly to the 390 included products.

Our dataset consists of the SMC-related seed and non-seed WOM for 390 cosmetic products from 192 different brands across 11 separate cosmetics product categories (e.g., nail polish, toner, face mask, lipstick). For each of the 390 campaigns, our data is weekly and starts in the week in which the first focal product seed WOM is observed ($t = 0$) and continues until no more seed or non-seed WOM posts are observed for the focal product in any of the forums. The mean number of weeks per campaign is 75.47 (SD = 39.68, min. = 12, max. = 159).

An alternative explanation for the social influence-related effects hypothesized earlier is that non-seed WOM occurs not due to seed WOM but instead as a result of other actions taken by marketers that we do not observe. For example, traditional advertising could affect online WOM or, more generally, the prominence of a product or brand is (which may be due to advertising or other marketing actions) could trigger WOM. Unfortunately, we do not have relevant product-level data and do not know if firms used other marketing tactics at the same time as their SMCs. However, in a country such as South Korea, with extremely high levels of Internet (and mobile Internet) access, the effects of product- or brand-level traditional marketing efforts may be detectable in online search volume data. Specifically, search trend data is thought to reflect collective consumer interest in products, which could be affected by firms' non-SMC marketing efforts. For example, search volumes at both the category and brand levels have been shown to be significantly affected by television advertising activity (Joo et al. 2014), and including search volume information has been shown to improve the fit of marketing mix models (Hu, Du, and Damangir 2014). Consequently, in this setting we expect it to be a reasonable proxy for unobserved non-SMC product-related and firm-initiated marketing activities that could conceivably affect non-seed WOM activity. Therefore, we collected this data from *Naver's*

search engine.⁸ Weekly search trends data was collected for all combinations of brand and category keywords (e.g., Chanel AND lipstick) corresponding to each of products in the SMCs in our dataset.

4.4 Variables

For each of the 390 products promoted through a SMC, we have weekly data capturing seed and non-seed WOM for the focal product, products from the same brand in different categories, and products from competing brands in the same category. Based on available data we measured the following 13 variables for each campaign (where j indexes campaign, and t indexes week):

1. *FocalSeedSpecialist_{jt}*. The number of posts about the focal product in campaign j in week t by seeds in specialist forums; i.e., focal product seed WOM.
2. *FocalNonseedSpecialist_{jt}*. The number of posts about the focal product in campaign j in week t by non-seeds in specialist forums; i.e., focal product non-seed WOM by specialists. This captures focal product spillover effects within the specialist segment.
3. *FocalNonseedGeneralist_{jt}*. The number of posts about the focal product in campaign j in week t by non-seeds in generalist forums; i.e., focal product non-seed WOM by generalists. This captures focal product spillover effects within the generalist segment.
4. *BrandNonseedSpecialist_{jt}*. The number of same-brand, different-category products related to campaign j mentioned in week t in specialist forums; i.e., same-brand

⁸ *Naver* is more popular than Google in that country; the *Naver* search “trends” data is essentially the same as Google Trends data for the U.S. and other countries.

non-seed WOM by specialists. This captures brand spillover effects within the specialist segment.

5. *BrandNonseedGeneralist_{jt}*. The number of same-brand, different-category products related to campaign j mentioned in week t in generalist forums; i.e., same-brand non-seed WOM by generalists. This captures brand spillover effects within the generalist segment.
6. *CategoryNonseedSpecialist_{jt}*. The number of different-brand, same-category products related to campaign j mentioned in week t in specialist forums; i.e., same-category non-seed WOM by specialists. This captures category spillover effects within the specialist segment.
7. *CategoryNonseedGeneralist_{jt}*. The number of different-brand, same-category products related to campaign j mentioned in week t in generalist forums; i.e., same-category non-seed WOM by generalists. This captures category spillover effects within the generalist segment.
8. *BrandSeedSpecialist_{jt}*. The number of same-brand products related to campaign j mentioned in week t in specialist forums by seeds; i.e., SMC activity for other products from the same brand. This is used as a control variable.
9. *CategorySeedSpecialist_{jt}*. The number of same-category products related to campaign j mentioned in week t in specialist forums by seeds; i.e., SMC activity for other products in the same category. This is used as a control variable.
10. *SearchTrends_{jt}*. Relative size of search trend volume (based on Naver) for combination of brand and category, corresponding to product being seeded in campaign j in week t . This is used as a control variable.

11. $AvgWords_{jt}$. The average number of words per seed WOM post for campaign j in week t . This is used as a control variable.
12. $AvgImages_{jt}$. The average number of images per seed WOM post for campaign j in week t . This is used as a control variable.
13. $TopReviewer_{jt}$. The number of seed WOM posts for campaign j in week t posted by seeds that are designated as “top” reviewers. This is used as a control variable.

5. Empirical Model

To estimate the WOM spillover effects described in our typology, we focus on three sets of dependent variables: (1) $FocalNonseedSpecialist_{jt}$ and $FocalNonseedGeneralist_{jt}$ for focal product spillovers, (2) $BrandNonseedSpecialist_{jt}$ and $BrandNonseedGeneralist_{jt}$ for brand spillovers, and (3) $CategoryNonseedSpecialist_{jt}$ and $CategoryNonseedGeneralist_{jt}$ for category spillovers. As hypothesized, each of these variables could be influenced by firms’ seeding actions. Additionally, the following four control variables, although not part of our conceptual framework, might also be influenced by seeding and are therefore treated as dependent variables: $FocalSeedSpecialist_{jt}$, $BrandSeedSpecialist_{jt}$, $CategorySeedSpecialist_{jt}$, and $SearchTrends_{jt}$.

Given that each of these variables could be influenced by seeding as well as by each other, we treat these ten variables as a “single” multivariate dependent variable for modeling purposes (i.e., each is treated as an endogenous outcome). Thus, for testing our hypotheses we use a ten-equation multivariate model (one equation for each of the six endogenous outcome variables and one for each of the four endogenous control variables) to estimate the hypothesized WOM spillover effects. Specifically, we log-transformed each variable (after adding one to avoid logarithms of zero) and estimated a multivariate dynamic model with campaign fixed effects to

account for unobserved campaign-level heterogeneity. The multivariate specification (i.e., an endogenous system of equations) was used to allow for interdependencies between the ten outcome variables through correlated errors. Within each equation, each outcome was regressed on a one-week lag of itself, one-week lags of each of the other nine outcomes, and each of the three above-described exogenous control variables ($AvgWords_{jt}$, $AvgImages_{jt}$, and $TopReviewer_{jt}$).

The model for campaign j and week t is $\log(\mathbf{Y}_{jt} + \mathbf{1}) = \Lambda \log(\mathbf{Y}_{j,t-1} + \mathbf{1}) + \mathbf{B}\mathbf{X}_{jt} + \mathbf{u}_j + \mathbf{e}_{jt}$.

Where $\mathbf{Y}_{jt} = [FocalSeedSpecialist_{jt}, FocalNonseedSpecialist_{jt}, FocalNonseedGeneralist_{jt}, BrandNonseedSpecialist_{jt}, BrandNonseedGeneralist_{jt}, CategoryNonseedSpecialist_{jt}, CategoryNonseedGeneralist_{jt}, BrandSeedSpecialist_{jt}, CategorySeedSpecialist_{jt}, SearchTrends_{jt}]$, $\mathbf{X}_{jt} = [AvgWords_{jt}, AvgImages_{jt}, TopReviewer_{jt}]$, \mathbf{u}_j are campaign fixed effects, $\mathbf{e}_{jt} \sim \text{Normal}(\mathbf{0}, \Sigma)$ where Σ is the variance-covariance matrix, Λ is the ten-by-ten matrix of effects of the lagged endogenous variables, and \mathbf{B} is a the matrix of effects of the exogenous control variables.

6. Results

6.1 Descriptive Statistics

Our results are based on 29,433 weekly observations for 390 SMCs for cosmetic products from 192 different brands and representing 11 categories. Descriptive statistics and correlations are reported in Tables 1 and 2, respectively. Per SMC, the average number of posts generated by seeds was 69.20 (median = 55, SD = 52.18, min. = 5, max. = 280). Generally, across campaigns, seeds' posting activities in any week, on average, however, were low ($M = .94$, median = 0, SD = 7.321, min. = 0, max. = 273). Not surprisingly, the first few weeks of a SMC typically produced the most WOM activity from seeds. For example, in the first four weeks of a campaign, the seeds posted an average of 49.67 posts (SD = 38.43, min. = 0, max. = 281, median = 40).

Moreover, in the typical campaign, 16% of the total number of seeds' posts for a campaign occurred in the first two weeks, and 95% of the total seeds' posts were occurred within six weeks.

[INSERT TABLES 1 AND 2 ABOUT HERE]

Non-seed WOM was generally more prevalent than seed WOM, as expected. Posts about the focal product by non-seeds in specialist forums (*FocalNonseedSpecialist*) ranged from zero to 2,340 posts ($M = 73.33$, $SD = 220.17$, median = 11), and from 0 to 2,272 ($M = 28.39$, $SD = 165.04$, median = 0) in generalist forums (*FocalNonseedGeneralist*). Also, non-seed WOM posts were generated at a slower rate than seeds' posts. For example, for the average campaign, only 7% of the total number of non-seed WOM posts (across specialist and generalist forums) occurred in the first two weeks of the campaign (vs. 16% for seed WOM), and only 26% occurred by the end of the sixth week (vs. 95% for seed WOM). This is consistent with our general prediction that WOM by seeds triggers non-seed WOM activity.

6.2 Hypothesis Tests: Spillover Effects

Model fit statistics are reported in Table 3. We estimated four nested models, of which the full model (Model 4 in Table 3) had the best fit. We therefore base our findings on the full model, which had effects of control variables (*AvgWords*, *AvgImages*, *TopReviewer*), same-variable lagged effects (e.g., the effect of *FocalNonseedSpecialist_{j,t-1}* on *FocalNonseedSpecialist_{jt}*), and other-variable lagged effects (e.g., the effect of *FocalSeedSpecialist_{j,t-1}* on *FocalNonseedSpecialist_{jt}*), including the spillover effects.

Note that we estimated two spillover models (3 and 4). The full model (4) estimated “direct” spillover effects (i.e., the effects of seed WOM on non-seed WOM about the focal product, other products from the same brand, and other products in the same category but from different brands) and “indirect” spillover effects that allowed for between-segment (specialist to

generalist and vice versa) effects. These indirect spillover effects allowed for the possibility that seed WOM would influence only one segment (e.g., specialists) directly but also impact the other segment (e.g., generalists) indirectly because non-seed WOM from the directly affected segment also affects non-seed WOM from the other segment. Model 3 restricted the spillover effects to be only direct. As the fit statistics show, allowing for both direct and indirect spillovers in Model 4 produced superior fit and is therefore likely more appropriate.

[INSERT TABLE 3 ABOUT HERE]

Parameter estimates for the spillover effects full model are reported in Tables 4 (focal product spillovers), 5 (brand spillovers), and 6 (category spillovers). These tables cover the six main dependent variables in our model. Parameter estimates for the other four variables treated as endogenous in our multivariate model (WOM by seeds for focal product, same brand, and same category, plus search trend) are reported in Tables WA1, WA2, and WA3 in the Web Appendix. The error correlation matrix is reported in Table WA4 in the Web Appendix.

[INSERT TABLES 4 TO 6 ABOUT HERE]

For the focal product spillover effects (Table 4), the effect of seed WOM on non-seed focal product WOM among specialists was positive and significant (.037, SE = .003, $p < .001$). The effect of seed WOM on non-seed focal product WOM among generalists was also positive, but did not reach significance (.004, SE = .002, $p = .10$). The effect of non-seed focal product WOM among specialists on non-seed focal product WOM among generalists, however, was positive and significant (.013, SE = .002, $p < .001$). Together, these results support H1 and indicate that seeds' conversations about the focal product do trigger increased WOM about the focal product by non-seeds. This occurs directly in the case of specialist consumers, and indirectly for generalist consumers. Note that the effect on generalists through specialists is

consistent with Katz and Lazarsfeld's (1955) two-step flow of communication theory that we mentioned earlier.

For the brand spillover effects (Table 5), we hypothesized negative effects; i.e., decreased non-seed WOM about other products from the same brand as the focal product. Both effects were negative, however only the brand spillover effect for generalists was significant ($-.006$, $SE = .002$, $p = .013$; for specialists: $-.006$, $SE = .004$, $p = .14$). We do note, however, that the effect of non-seed same-brand WOM among generalists on non-seed same-brand WOM among specialists was positive and significant ($.038$, $SE = .006$, $p < .001$), which means that when seed WOM decreases same-brand WOM by generalists it indirectly also decreases same-brand WOM by specialists. Thus, these results provide support for H2. Interestingly the (direct) brand spillover effect is present (and therefore stronger) for generalists and not specialists. This suggests that generalists are more susceptible to being focused on the focal product and away from other products from the same brand when exposed to seed WOM about the focal product.

The category spillover effects (Table 6), similar to the brand spillover effects, were hypothesized to be negative; i.e., decreased non-seed WOM about other products in the same category as the focal product from other brands. Both effects were negative, but only the category spillover effect for specialists was significant ($-.012$, $SE = .003$, $p = .001$; for generalists: $-.009$, $SE = .006$, $p = .11$). The effect of non-seed same-category WOM among specialists on non-seed same-category WOM among generalists, however, was positive and significant ($.137$, $SE = .008$, $p < .001$). Thus, when seed WOM decreases same-category WOM by specialists it indirectly also decreases same-category WOM by generalists. These results are consistent with H3. The (direct) category spillover effect is present (and therefore stronger) for specialists but not for generalists (similar to the focal product spillovers and opposite to brand spillovers). Unlike for brand spillovers (where generalists were more susceptible to being focused on the

focal product by seed WOM), in the case of category spillovers it is non-seed specialists who are most susceptible to their WOM being focused more narrowly on the focal product instead of on category-level conversations.

7. Discussion and Conclusion

Seeding and related approaches such as influencer marketing and social referral programs are increasingly popular among marketers and continue to be the focus of a growing stream of literature. However, while prior research focuses mainly on aspects related to SMC design (particularly seed selection) or whether SMCs produce positive results with respect to WOM generation and sales of the focal product, the literature has not considered some of the broader consequences of firm-initiated seeded marketing programs. The goal of the current research was to take a first step in this direction by introducing and empirically testing a typology of WOM spillover effects in the context of SMCs in online settings. Generally, our findings indicate that SMC-triggered WOM by firm-selected seed customers can spur a variety of spillover effects at the focal product, brand, and category levels. Moreover, these spillover effects vary in their size, with focal product spillovers being the largest (and brand spillovers being the smallest). Consistent with our conceptualization, we found that SMCs for particular products have the intended effect of generating non-seed WOM about a campaign's focal product, and can also *reduce* WOM about related—but “off topic”—aspects at the brand and category levels.

The negative brand and category spillover effects are counterintuitive and suggest that seeding focal products with specialist consumers and encouraging them to generate WOM can serve an additional purpose for marketers in terms of helping non-seed consumers focus on the focal product when generating their own WOM. The negative spillovers are interesting because

spillovers in the advertising literature are primarily positive. Instead, we find that, for example, the more seeds talk about Chanel lipstick (focal product), the less non-seeds will talk about Chanel products in other categories and the less they will talk about other brands of lipstick. Despite it being highly likely that exposure to a focal product cues brand- and/or category-level thoughts, such cues do not seem to materialize as additional non-seed WOM about brand- and/or category-level topics (which would have been the case if brand and/or category spillover effects were positive).

While traditional advertising literature typically considers positive brand spillovers as beneficial for the firm (e.g., when advertising one product also lifts awareness for other products under the same brand), the fact that we find WOM brand spillover effects to be negative might not necessarily spell bad news for marketers. Firms may value the ability of SMCs to help non-seed consumers to focus on the focal product and reduce buzz about other products under the same brand in a variety of market settings. For example, this could help a firm when it is introducing a new product and wants attention to be focused on that product and not other products in the brand portfolio. It may also be helpful when there is a substantial variation in product quality or desirability across products under the same brand and a firm does not want negative brand associations to contaminate WOM and consumers' perceptions about a focal product in an SMC. Finally, marketers may simply not want to have to "compete" against themselves for WOM when running an SMC for a particular product in their lineup, and the negative brand spillover effect suggests that this is unlikely to be the case (particularly for generalist consumers).

The presence of negative category spillovers is important from a competitive standpoint. It suggests that firms could benefit from SMCs not only through the positive effect on WOM for the own focal product, but also through the negative effect on WOM for competitors' products in

the same category as the focal product. Taken a step further, this implies that firms could strategically deploy SMCs when wanting to mitigate WOM for competitors' products in the same category.⁹ Similar to the case of brand spillovers, negative category spillover effects may also make firms using SMCs better or worse off depending on the market environment. For example, when capturing higher market share is important for a firm's success, a negative effect on competitors' WOM is beneficial; however, firms with dominant market positions that are primarily interested in growing the overall market size would not find such an effect to be a beneficial externality of running an SMC.

Our study also uncovers the key role that non-seed specialist consumers can play in WOM diffusion processes. Non-seed specialists, as opposed to non-seed generalists, seem to be important because their proclivity for specific discussion about the focal product (vs. more general things related to the focal product) is important for keeping the conversation started by seeds on topic and focused on the SMC's focal product instead of other things. More specifically, non-seed specialists are important for the following reasons. First, they pay attention to any new product-related information coming from seeds posting reviews of focal products featured in SMCs, and able to attend to and process it, due to their relatively high level of category expertise. Second, they do not consider product reviews posted by seeds to be suspicious or misleading, as they are familiar with the seed selection process (e.g., because they might have been seeds themselves in previous campaigns) and understand that the free-sample incentives will not necessarily bias seeds' opinions, which is an issue that generalist consumers might, however, be worried about. Third, non-seed specialists disseminate the information they receive from seeds (often augmented with their own thoughts), therefore increasing WOM about the focal product.

⁹ This is in contrast with previous findings on positive category spillovers in other domains of marketing communications, such as advertising (e.g., Lewis and Nguyen 2014; Sahni 2013).

This could be because they are motivated to actively generate WOM for extrinsic and intrinsic reasons (e.g., need to stay active in order to remain a member of the specialist community, self-presentation and self-enhancement motives). The importance of these three factors becomes clear when we consider generalists. They typically pay lower attention to online product-focused communities, put less trust in reviews written by seeds in exchange for free products, and their threshold for product-specific WOM volume to become noticeable is higher than for specialists. Hence, non-seed specialists seem to play a critical “bridging” or “boundary spanning” role in spreading focal product WOM from seeds to generalists.

The current study is not without limitations. While we expect that product-related WOM may be influenced by outside factors such as traditional media (e.g., Stephen and Galak 2012), we do not have rich data on non-SMC marketing activities that could have allowed us to include other product-related marketing activities (or marketing mix variables) in our framework and model. Nevertheless, we did include online search trend data to control for the possibility that SMC-driven effects were instead due to other marketing activities. Also, to the extent that external WOM influences (e.g., advertising) varied systematically across campaigns/products, the inclusion of campaign fixed effects arguably helps control for unobserved influences on seed and non-seed WOM activities. Another limitation is that our data does not account for WOM valence (only volume). This is because reliable sentiment analysis algorithms are not available for the Korean language, and manually scoring post sentiment is infeasible given the large number of posts. However, this is only worrisome if there is substantial variation in valence across forum posts and campaigns. To assess the likelihood of this, we randomly sampled 30 campaigns (out of 390) and had a native Korean speaker manually read the collected posts and judge their valence. The native speaker found most of the posts were positive: opinions judged as “mostly negative” accounted for a mere 1.3% of total WOM volume in the sample (which

covered both specialist and generalist forums), and opinions judged as “mixed” were 4.3% and 1.3% of WOM volume in the specialist and generalist forums, respectively. Thus, our findings are based on predominantly positive seed and non-seed WOM (similar to the online community data in Stephen and Galak 2012). Nevertheless, it would be interesting for future research to test our WOM spillovers typology in contexts where WOM valence exhibits greater variance. Finally, we note two additional limitations. First, the current study is limited to a single product type. Although the cosmetics industry is large and features many distinct categories, it would be interesting to examine different industries to see how the identified spillover effects might vary. Such an analysis could possibly extend recent work on different types of products in viral/WOM marketing contexts (e.g., Lovett et al. 2013; Schulze et al. 2014). Second, due to the nature of our data, we were unable to consider consumer-related characteristics other than specialist or generalist segment membership.

In conclusion, this research addresses an important aspect of WOM and seeding that has received scant attention in extant literature: the broader consequences of SMCs in terms of spillover effects. Our findings indicate that a variety of spillovers can occur. Generally, these spillovers indicate that seeding WOM about a focal product among specialist consumers can in fact help focus non-seed consumers’ conversations on the focal product and commensurately mitigate tendencies for them to go “off topic” and generate WOM about the brand’s other products. Additionally, in the case of category spillovers, this increased focus on the focal product can come at the expense of conversations about competitors’ products in the same category, which suggests that SMCs could be used for competitive purposes also. In summary, this research uncovers the presence of WOM spillover effects as consequences of a SMC and underscores the importance of taking these into account when planning SMCs and assessing the value of such programs. We hope this study spurs additional research on this and related topics.

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Table 1
Descriptive Statistics

	Mean	Median	St. Dev.	Min.	Max.
Endogenous Variables:					
FocalNonseedSpecialist _{jt}	73.33	11.0	220.17	0	2340
FocalNonseedGeneralist _{jt}	28.39	0	165.04	0	2272
BrandNonseedSpecialist _{jt}	54.44	16.5	86.69	0	490
BrandNonseedGeneralist _{jt}	17.88	0	45.19	0	294
CategoryNonseedSpecialist _{jt}	1759.68	1391.0	1419.32	0	10458
CategoryNonseedGeneralist _{jt}	564.79	384.0	479.60	0	3406
FocalSeedSpecialist _{jt}	69.20	55.0	52.18	5	280
BrandSeedSpecialist _{jt}	23.27	5.0	41.23	0	227
CategorySeedSpecialist _{jt}	405.17	330.0	336.75	0	1679
SearchTrends _{jt}	6.40	0	22.92	0	182.64
Control Variables:					
AvgWords _{jt}	13.29	8.88	12.82	1.29	73.75
AvgImages _{jt}	.72	.45	.73	.01	4.87
TopReviewer _{jt}	6.25	4.0	16.59	0	189

These statistics are computed per campaign.

Table 2
Correlations Between Endogenous Variables

Correlations between variables in the same period										
	1	2	3	4	5	6	7	8	9	10
1. FocalNonseedSpecialist										
2. FocalNonseedGeneralist	.323									
3. BrandNonseedSpecialist	.107	-.013								
4. BrandNonseedGeneralist	.069	.033	.377							
5. CategoryNonseedSpecialist	.011	-.013	.127	.014						
6. CategoryNonseedGeneralist	.008	-.005	.086	.045	.676					
7. FocalSeedSpecialist	.108	.042	.003	.004	-.013	-.005				
8. BrandSeedSpecialist	-.092	-.045	.099	.056	.082	.007	-.027			
9. CategorySeedSpecialist	-.096	-.035	-.025	-.069	.486	.218	-.029	.199		
10. SearchTrends	.264	.091	.147	.172	.058	.056	.020	-.089	-.146	
Correlations between one-week lagged variables and current-week variables										
	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5	Lag 6	Lag 7	Lag 8	Lag 9	Lag 10
1. FocalNonseedSpecialist	.776	.318	.095	.067	.005	.006	.100	-.094	-.097	.257
2. FocalNonseedGeneralist	.317	.914	-.013	.030	-.013	-.008	.045	-.044	-.036	.088
3. BrandNonseedSpecialist	.093	-.014	.723	.356	.106	.075	.003	.094	-.027	.146
4. BrandNonseedGeneralist	.068	.028	.370	.679	.012	.022	-.001	.042	-.070	.174
5. CategoryNonseedSpecialist	.010	-.011	.106	.012	.876	.650	-.012	.078	.475	.058
6. CategoryNonseedGeneralist	.008	-.007	.081	.024	.658	.745	-.007	.005	.211	.055
7. FocalSeedSpecialist	.097	.033	.007	.002	-.009	-.011	.179	-.027	-.029	.020
8. BrandSeedSpecialist	-.091	-.044	.099	.056	.083	.007	-.023	.946	.196	-.089
9. CategorySeedSpecialist	-.095	-.033	-.025	-.069	.473	.212	-.028	.196	.970	-.145
10. SearchTrends	.258	.090	.147	.172	.058	.057	.018	-.089	-.147	.938
VIF	1.22	1.12	1.21	1.19	2.43	1.90	1.01	1.07	1.46	1.15

Table 3
Model Fit

	1	2	3	4
Control variables	Yes	Yes	Yes	Yes
Campaign fixed effects	Yes	Yes	Yes	Yes
Same-variable lagged effects	Yes	Yes	Yes	Yes
Other-variable lagged effects	No	Yes	Yes	Yes
Spillover effects (direct)	No	No	Yes	Yes
Spillover effects (indirect also) ^a	No	No	No	Yes
-2 log-likelihood	35,780	33,756	33,664	33,116
AIC	35,989	34,122	34,042	33,506
BIC	36,860	35,639	35,608	35,123

^a Indirect spillover effects are the effects of specialists on generalists and generalists on specialists for each type of spillover.

Table 4
Focal Product Spillover Effects

	FocalNonseedSpecialist			FocalNonseedGeneralist			
	Est.	SE	p	Est.	SE	p	
Intercept	-.001	.002	.551	.000	.001	.825	
FocalSeedSpecialist	.037	.003	.000	.004	.002	.104	
FocalNonseedSpecialist	.284	.003	.000	.013	.002	.000	***
FocalNonseedGeneralist	.056	.007	.000	.287	.002	.000	***
BrandNonseedSpecialist	.005	.007	.407	.000	.004	.919	
BrandNonseedGeneralist	-.001	.011	.896	.010	.005	.030	**
CategoryNonseedSpecialist	.000	.008	.956	.001	.005	.870	
CategoryNonseedGeneralist	-.012	.005	.008	.003	.003	.383	
BrandSeedSpecialist	-.004	.010	.683	.005	.007	.475	
CategorySeedSpecialist	.008	.005	.131	.004	.003	.264	
SearchTrends	.052	.005	.000	.019	.002	.000	***
AvgWords	.000	.000	.067	.000	.000	.793	*
AvgImages	.005	.002	.003	.000	.001	.902	***
TopReviewer	.001	.002	.532	.001	.001	.252	

* $p < .10$, ** $p < .05$, *** $p < .01$.

Explanatory variables are lagged (except *AvgWords*, *AvgImages*, *TopReviewer*).

Pseudo-R is the correlation between the actual and model-predicted values of the dependent variable.

N = 29,433 over 390 campaigns featuring 192 brands and 11 product categories.

Table 5
Brand Spillover Effects

	BrandNonseedSpecialist			BrandNonseedGeneralist			
	Est.	SE	p	Est.	SE	p	
Intercept	.000	.001	.971	.000	.001	.729	
FocalSeedSpecialist	-.006	.004	.139	-.006	.002	.013	**
FocalNonseedSpecialist	.008	.005	.072	-.001	.003	.716	*
FocalNonseedGeneralist	.001	.008	.936	.012	.004	.001	***
BrandNonseedSpecialist	.192	.004	.000	.029	.002	.000	***
BrandNonseedGeneralist	.038	.006	.000	.137	.003	.000	***
CategoryNonseedSpecialist	.009	.006	.137	.002	.004	.654	
CategoryNonseedGeneralist	.001	.004	.758	.000	.002	.883	
BrandSeedSpecialist	.051	.006	.000	.000	.004	.963	***
CategorySeedSpecialist	.000	.005	.988	-.005	.003	.076	*
SearchTrends	.012	.005	.012	.007	.003	.024	**
AvgWords	.000	.000	.820	.000	.000	.057	*
AvgImages	.000	.002	.969	.000	.001	.553	
TopReviewer	.000	.003	.962	.000	.003	.954	

* $p < .10$, ** $p < .05$, *** $p < .01$.

Explanatory variables are lagged (except *AvgWords*, *AvgImages*, *TopReviewer*).

Pseudo-R is the correlation between the actual and model-predicted values of the dependent variable.

N = 29,433 over 390 campaigns featuring 192 brands and 11 product categories.

Table 6
Category Spillover Effects

	CategoryNonseedSpecialist				CategoryNonseedGeneralist			
	Est.	SE	p		Est.	SE	p	
Intercept	.001	.002	.443		.000	.003	.985	
FocalSeedSpecialist	-.012	.003	.001	***	-.009	.006	.113	
FocalNonseedSpecialist	.002	.004	.666		-.012	.007	.114	
FocalNonseedGeneralist	-.008	.008	.304		-.002	.013	.898	
BrandNonseedSpecialist	-.015	.006	.009	***	.004	.009	.691	
BrandNonseedGeneralist	.001	.009	.899		-.012	.014	.406	
CategoryNonseedSpecialist	.318	.004	.000	***	.137	.008	.000	***
CategoryNonseedGeneralist	.046	.003	.000	***	.348	.004	.000	***
BrandSeedSpecialist	.022	.008	.004	***	.011	.012	.380	
CategorySeedSpecialist	.139	.004	.000	***	.079	.007	.000	***
SearchTrends	.008	.006	.137		-.004	.009	.622	
AvgWords	.000	.000	.520		.000	.000	.837	
AvgImages	.000	.002	.620		.000	.004	.968	
TopReviewer	.000	.002	.989		.001	.005	.861	

* $p < .10$, ** $p < .05$, *** $p < .01$.

Explanatory variables are lagged (except *AvgWords*, *AvgImages*, *TopReviewer*).

Pseudo-R is the correlation between the actual and model-predicted values of the dependent variable.

N = 29,433 over 390 campaigns featuring 192 brands and 11 product categories.

Web Appendix

Table WA1
Effects for Focal Product WOM By Seeds

	FocalSeedSpecialist			
	Est.	SE	p	
Intercept	-.005	.006	.342	
FocalSeedSpecialist	.221	.002	.000	***
FocalNonseedSpecialist	.019	.004	.000	***
FocalNonseedGeneralist	-.009	.007	.257	
BrandNonseedSpecialist	-.003	.007	.647	
BrandNonseedGeneralist	.006	.001	.593	
CategoryNonseedSpecialist	.003	.007	.731	
CategoryNonseedGeneralist	-.007	.004	.111	
BrandSeedSpecialist	-.031	.009	.000	***
CategorySeedSpecialist	-.059	.005	.000	***
SearchTrends	-.009	.005	.111	
AvgWords	.003	.000	.000	***
AvgImages	.078	.000	.000	***
TopReviewer	.032	.000	.000	***

* $p < .10$, ** $p < .05$, *** $p < .01$.

Explanatory variables are lagged (except *AvgWords*, *AvgImages*, *TopReviewer*).

Pseudo-R is the correlation between the actual and model-predicted values of the dependent variable.

N = 29,433 over 390 campaigns featuring 192 brands and 11 product categories.

Table WA2
Effects for Same Brand and Same Category WOM By Seeds

	BrandSeedSpecialist			CategorySeedSpecialist			
	Est.	SE	p	Est.	SE	p	
Intercept	.001	.001	.184	.003	.001	.013	**
FocalSeedSpecialist	.002	.001	.161	-.001	.002	.000	***
FocalNonseedSpecialist	.004	.002	.013	.001	.003	.622	**
FocalNonseedGeneralist	.000	.003	.955	.001	.005	.911	
BrandNonseedSpecialist	.001	.002	.581	-.001	.004	.815	
BrandNonseedGeneralist	-.006	.003	.028	.002	.006	.748	**
CategoryNonseedSpecialist	.006	.002	.009	.027	.004	.000	***
CategoryNonseedGeneralist	.001	.001	.319	.004	.002	.107	
BrandSeedSpecialist	.846	.002	.000	.013	.006	.027	**
CategorySeedSpecialist	.007	.002	.000	.866	.003	.000	***
SearchTrends	.003	.002	.135	.001	.003	.759	
AvgWords	.000	.000	.449	.000	.000	.006	***
AvgImages	.000	.001	.640	.003	.001	.037	**
TopReviewer	.000	.001	.785	.000	.002	.994	

* $p < .10$, ** $p < .05$, *** $p < .01$.

Explanatory variables are lagged (except *AvgWords*, *AvgImages*, *TopReviewer*).

Pseudo-R is the correlation between the actual and model-predicted values of the dependent variable.

N = 29,433 over 390 campaigns featuring 192 brands and 11 product categories.

Table WA3
Effects for Search Trend

	SearchTrend		
	Est.	SE	p
Intercept	.000	.002	.979
FocalSeedSpecialist	.005	.004	.183
FocalNonseedSpecialist	.036	.004	.000 ***
FocalNonseedGeneralist	.034	.006	.000 ***
BrandNonseedSpecialist	.003	.005	.561
BrandNonseedGeneralist	.011	.008	.156
CategoryNonseedSpecialist	.008	.008	.323
CategoryNonseedGeneralist	.000	.004	.914
BrandSeedSpecialist	-.003	.009	.739
CategorySeedSpecialist	-.005	.004	.213
SearchTrends	.601	.002	.000 ***
AvgWords	.000	.000	.417
AvgImages	.001	.002	.653
TopReviewer	.000	.003	.979

* $p < .10$, ** $p < .05$, *** $p < .01$.

Explanatory variables are lagged (except *AvgWords*, *AvgImages*, *TopReviewer*).

Pseudo-R is the correlation between the actual and model-predicted values of the dependent variable.

N = 29,433 over 390 campaigns featuring 192 brands and 11 product categories.

Table WA4
Error Correlations

	1	2	3	4	5	6	7	8	9
1. FocalNonseedSpecialist									
2. FocalNonseedGeneralist	.035								
3. BrandNonseedSpecialist	.106	.012							
4. BrandNonseedGeneralist	.018	.078	.064						
5. CategoryNonseedSpecialist	.025	-.004	.081	.014					
6. CategoryNonseedGeneralist	-.008	.025	.026	.079	.119				
7. FocalSeedSpecialist	.045	.008	-.015	-.001	-.007	.001			
8. BrandSeedSpecialist	.007	.005	.033	.048	.018	.008	-.020		
9. CategorySeedSpecialist	-.006	.005	.010	-.003	.088	.066	-.010	.059	
10. SearchTrends	.036	.027	-.012	-.001	.007	.000	.008	.008	.014