Abstract

Social media is primarily a tool for online interpersonal communication, but it could also be used for marketing (e.g., promoting products/brands through word-of-mouth on social media, providing online advertising, or extracting customers’ perceptions from communication data). The goal of this study is to provide insights into the welfare issues of social media as a platform for marketing. This article reviews existing research regarding social media use of customers, that of marketers, and the decision-making of social media platformers. For the customer side, we mainly discuss online communication about products and services (i.e., eWOM: electronic word-of-mouth), since it is the most relevant to marketing; for the marketer side, we focus on marketing activities to approach interpersonal communication, which social media facilitate. We survey existing research mainly in economics and marketing that is relevant to the issues.

1 Introduction

Marketing activities are increasingly shifting from traditional media, such as television or magazine, to online venues called social media, such as Facebook and Twitter. There is growing concern of marketers regarding how social media could be possibly used for marketing, and how they could improve their marketing efficiency. Practitioners are aggressively developing ways to pursue profits. Social media is, however, used originally for communication between persons, not for marketing by firms. The persons are potential customers of marketers, and might be benefited or harmed by their marketing activities on social media. There is a potential tension between marketers and customers, as it has been observed for the case of traditional media with respect to, for example, the nuisance brought by advertising. For the case of social media, the tension could be exposed in other forms; an extreme example is “stealth marketing,” in which marketers promote their own products pretending to be a consumer. Compared to the case of traditional media, the tension might be far more crucial, as in the near-future, social media could be an indispensable infrastructure for interpersonal communication.

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The goal of this study is to provide insights into the welfare issues of social media as a platform for marketing. This article reviews existing research regarding social media use of customers, that of marketers, and the decision-making of social media platformers. Note that, throughout the paper, we use the term “customers” to represent persons using a social media site to communicate each other. This is because they are potential customers of the other side of social media platform: “marketers.” Our focus in discussing social media uses of customers and marketers is centered on the following issues. For the customer side, we mainly discuss online communication about products and services (i.e., eWOM: electronic word-of-mouth), since it is the most relevant to marketing. For the marketer side, we focus on marketing activities to approach interpersonal communication, which social media facilitate. We survey studies mainly in economics and marketing that is relevant to the issues.

Throughout the paper, we stress the importance of the perspective of a platform. In considering marketing on social media from the welfare perspective, not only the effects on firm profits, but also those on customer benefits, should be investigated. The route for marketing activities to affect customers’ benefit is not necessarily direct, as in the case of stealth marketing. There are also indirect routes through changes in pricing schemes or site design, which are decided by social media platforms taking into account possible uses for marketing activities.

There are various ways to define social media, and accordingly, there is no definite consensus on which sites should be referred to as social media. We think that an important feature of social media is facilitating online interpersonal communication. In this article, we thus make social media refer to not only social communication sites, such as Facebook or Twitter, but also reviewing sites like Amazon or Expedia, content sharing sites like YouTube, or blogging sites. The feature of facilitating “interpersonal communication” distinguishes those sites from traditional media, where users (e.g., viewers of television) are usually just receivers of contents. It is worth noting that the “online” feature, which those sites have in common, makes it easier for marketers to use data on interpersonal communication for several marketing activities as discussed later.

We plan this article along with the perspective of a platform. We first discuss the customer side (Section 2), and then, proceed to the marketer side (Section 3), without explicitly mentioning the decision-making of a social media platformer. We finally combine these discussions in the perspective of a social media as a service provider for both sides (Section 4).

In Section 2, we discuss customers’ uses of social media and the associated benefit. Although customers use social media for the purpose of, for example, daily communication and exchanging greeting massages, the most important usage regarding marketing would be eWOM. Customers’ purchasing behaviors are likely to be affected by eWOM; for example, they read reviews on Amazon before deciding whether to buy a product; and they notice the existence of an attractive product by viewing their friend’s postings on it on Facebook. In Subsection 2.1, we review marketing studies regarding eWOM behaviors of customers. In Subsection 2.2, we discuss consequences of eWOM, focusing on learning about product quality. More specifically, we draw out implications from economics studies on social learning.

In Section 3, we discuss the marketer side. The most distinguishing feature of social
media in facilitating marketing activities is to enable marketers to access interpersonal communication. The feature is used by marketers for intervening in eWOM, information gathering, and advertising. In Subsection 3.1, we review studies that examine the impacts of eWOM on firm sales. The studies largely indicate positive effects of eWOM on sales. In Subsection 3.2, we discuss three types of firms’ interventions in eWOM, namely, targeting of influential consumers, rewarding feedback, and manipulative postings. In Subsection 3.3, we review studies that examine the issue of information gathering from eWOM about customers’ preferences and perception on products. In Subsection 3.4, we discuss advertising on social media.

In Section 4, we discuss decision-making by social media platforms about their services for both sides. In Subsection 4.1, we first discuss provision of customers’ data toward marketers. In Subsection 4.2, we discuss site design that affects the manner of communication between customers.

In Section 5, we conclude the article suggesting directions for further research. A main observation from reviewing relevant research is that investigating social media as a platform from the welfare perspective is an ongoing field of study.

We also remind readers of the selective nature of this survey. Hence, the survey does not include various technical issues in improving marketing efficiency utilizing social media, which could be of interest to practitioners. Rather, our purpose is to highlight the issues and discussion regarding overall social welfare (see, for example, Hill, Provost, and Volinsky (2006) for a review about technical issues of network-based marketing).

2 Communication tool for customers

This section focuses on the customer side of social media platform. We focus on eWOM, which likely affects customers’ purchasing behavior, and is directly related to marketing. In subsection 2.1, we review marketing studies regarding eWOM behaviors of customers. In subsection 2.2, we discuss consequences of eWOM. More specifically, we draw out implications from economics studies on social learning.

2.1 eWOM behavior of individual customers

We first review studies that investigate eWOM behaviors of customers. Customers make decisions on their contribution to eWOM; they can choose whether to post comments about products that they have bought; and, if they decide to post, they can choose what to post. Investigating these decisions is important to understand possible discrepancies between eWOM and the customer base’s overall opinion of the product. We note that these decisions are relevant for WOM in general, regardless of whether it is online (i.e., eWOM) or offline. Social media enables researchers to access communication data, thus facilitating the analysis of the decisions.

Whether to post

eWOM is composed of postings by customers. However, there is an observation for online communications that industry analysts call the participation inequality phenomenon—only a small proportion of individuals on social media sites actually contribute to con-
tents.\footnote{An industry report, for example, shows that 10% of Twitter users produce 90% of tweets (see Heil and Piskorski (2009)).} It might imply that many individuals do not make full use of the chance to contribute to eWOM. In addition, even for the individuals who aggressively do so, it would be impossible to post for all purchased products/services. Customers decide, consciously or unconsciously, whether to post about each product/service.

There is empirical evidence for “differentiation behavior,” such that customers are more likely to post when their opinions differ more from the average opinion. For example, Godes and Silva (2012) find evidence in the context of book ratings posted on Amazon.com.\footnote{Li and Hitt (2008) and Godes and Silva (2012) report a declining trend on Amazon.com in posted ratings for books. Godes and Silva (2012) argue that “differentiation behavior” is one of the sources for the observed dynamics.} In the studies we see below, it is further argued that the decisions regarding whether to post are heterogeneous among customers; even for the same customer, the decision changes depending on the relationship between her/him and a firm, and on the size of audience.

Moe and Schweidel (2012) indicate heterogeneity between frequent and less frequent posters. The authors examine online ratings data for a retailer’s bath, fragrance, and home products, where each rating is posted in a five-star format. The frequent posters tend to post relatively negative ratings, and exhibit the “differentiation” behavior that is similarly argued by Godes and Silva (2012). The less frequent posters, in contrast, tend to post relatively positive ratings, and exhibit “bandwagon” behavior— they are more likely to post when their ratings are similar to previous posts. Overall, they find that frequent posters dominate online opinions, and thus, the posted contents might become negative compared to the customer base’s overall opinion of the product.

Other studies further suggest that even the same customer exhibits different kinds of posting behaviors, depending on the state of the relationship with a firm. In the context of customers’ compliments or complaints about products/services, Ma, Sun, and Kekre (2015) investigate the dynamics of customers’ voicing behaviors. They collect data of online text messages posted on Twitter that refer to products/services of a firm. The collected posts are classified into three categories based on valence: positive (compliment), negative (complaint), or neutral. Their results indicate that a customer’s voicing behavior depends on the state of underlying relationships with the firm, as follows. Customers in the negative state tend to complain, and exhibit “differentiation behavior,” tending to complain when their friends\footnote{On Twitter, users can subscribe to other users’ postings, known as “following” a user. Here, we let a user’s “friends” mention those the user follows. Note that “following” essentially indicates a directed relationship, and “friends” are accordingly mentioned.} compliment. In contrast, customers in the positive state tend to compliment, and exhibit “bandwagon” behavior, tending to compliment when their friends compliment.

Toubia and Stephen (2013) argue the potential relevance of the size of the audience to posting frequency. The authors empirically investigate how an increase in the number of receivers affects the frequency of messages sent in a microblogging site, Twitter. They conducted field experiments in which the numbers of “followers,” who receive the sent messages, are exogenously increased. They find that an increase in “followers” encourages some users to post more content, but other users to post less content.
What to post

Studies exist that indicate customers do not always truthfully post their opinions. Schlosser (2005) demonstrates that posters adjust their publicly revealed opinions. In her experiments, participants watched a short clay animation. Then, their private attitudes (whether the film is favorable, interesting, irritating, etc.) were elicited. After that, the participants read either a positive or negative review about the film, or no review. Finally, the participants reviewed the film, either publicly (posters) or privately (lurkers). The author finds that posters exhibit a “negativity bias” in the sense that posters publicly rate the product less favorably when they receive a negative review than a positive/no review. In contrast, they do not find any bias for the reviews by lurkers. The author argues that when posters receive a negative review, they might think that posting a positive opinion might signal a lack of intelligence, and hesitate to truthfully post the positive opinion.

2.2 Consequences of eWOM: social learning about product quality

The previous section discusses eWOM behaviors of individual customers. This section discusses consequences of eWOM. A possible benefit customers obtain through eWOM is the following; if a customer knows through eWOM that her/his friend bought a product or that the friend is satisfied with the product, the customer could modify her/his inference on the quality of the product, and adjust her/his purchasing behavior. Under what circumstances can customers effectively adjust their purchasing behaviors through eWOM? The situation stated above can be framed as that of social learning, where individuals learn the quality of products through some form of communication. In this perspective, the economics literature of social learning provides implications.

A remarkable insight brought by the earlier theoretical studies of social learning (Banerjee (1992), Bikhchandani, Hirshleifer, and Welch (1992)) is that social learning can be greatly hindered because of the occurrence of “herding.” They point out that there is a situation where, for an individual, it is better to simply “imitate” others’ actions (e.g., purchasing behaviors) than to carefully learn from other sources (e.g., privately available information/signal). In settings of sequential decision-making adopted in relevant theoretical studies, “herding” is said to occur when an individual starts to effectively “imitate” her/his predecessor’s action. When communication among individuals is mostly regarding their actions as supposed in the literature, the situation of herding would hinder social learning, since privately owned information is not necessarily revealed. For our purpose, their works and subsequent theoretical studies have implications regarding how social learning through eWOM is affected by characteristics of social media sites: types of users, charges for use, forms to display the contents, and existence of influencers. Below, we discuss the implications in the order.

Types of users: similarity of preferences

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4 In the Appendix, we outline the logic of “herding” discussed in the literature, presenting a baseline setting. See Mobius and Rosenblat (2014) for an extensive survey of social learning, regarding both theoretical and empirical research.

5 The characteristics of social media are affected by decision-making of social media as a platformer. We discuss the decision-making of social media in Section 4.
Similarity of users’ preferences is relevant for social learning. Ratings/reviews sites like Amazon.com are typically open to anyone, and thus, a certain amount of communication on such sites might be generated by customers whose preferences diverge (“strangers”). In contrast, there are sites whose foundation is communication with friends, such as Facebook or Twitter. In those sites, the share of communication between customers with similar preferences (“friends”) might be larger than review sites. Zhang, Liu, and Chen (2015) argue that herding is less likely for the “stranger-network,” where individuals have heterogeneous preferences, compared to the “friend-network,” where individuals have the same preferences. Their analysis indicates a potential drawback of relying excessively on those sites for the purpose of learning about products.

Types of users: experts and amateurs

In some rating/review sites, expert reviewers are invited to post ratings/reviews for new items and items in pre-release. Naive reasoning would entail a belief that better information is provided by experts. In line with this logic, a more radical way might be that only experts are allowed to post ratings/reviews, excluding amateurs. Encouraging amateurs’ postings, however, might contribute to enhancing social learning.

The analysis of Bikhchandani et al. (1992) indicates that opinions of amateurs in early stages could be more beneficial to others compared to those of experts. They introduce heterogeneity regarding the accuracy of consumers’ private signals; a consumer is either an “expert” who observes a signal with higher accuracy, or an “amateur” who observes a signal with lower accuracy. Suppose that the types of consumers are common knowledge. Since consumers are less likely to imitate the actions of amateurs than those of experts, opinions of amateurs in early stages could make more consumers reveal private information. As a result, when the difference in signal accuracy between experts and amateurs is sufficiently small, letting amateurs post opinions in the early stages would enhance social learning.

Wu (2015) examines a similar setting in which consumers do not necessarily know the others’ types. He argues that the existence of amateurs could enhance social learning; consumers become more careful in imitating past actions, thus more information will be revealed.

Charges for observing past communication

Though, in reality, ratings/reviews are usually viewed without the imposition of a fee, corresponding e-commerce sites may opt to establish one. Surprisingly, costly observation might enhance social learning. In the context of social learning, Song (2016) examines the effect of fixed costs in observing past actions. His analysis indicates that costly observation may allow more information to be revealed. Intuitively, consumers choose not to observe past actions when their private signals are sufficiently accurate. The actions of such non-observing consumers could provide additional information to others, and thus, enhance social learning.

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6Amazon has an explicit program called the Vine program. See https://www.amazon.com/gp/vine/help. It mentions that “Customers who consistently write helpful reviews and develop a reputation for expertise in specific product categories are most likely to be invited into the program.”

7In the work of Bikhchandani et al. (1992), the informational influence of the “expert” is argued in relation to the role of various opinion leaders or fashion leaders.
Summary information about past communication

Ratings/reviews are sometimes presented with summary information, such as the distribution of posts for each grade (e.g., 10% for five stars, 40% for four stars, etc.). However, summarization of ratings/reviews could affect social learning by loss of relevant information. Monzón and Rapp (2014) consider the setting in which a consumer may not know the position in the sequence, or the positions of others’ actions that she/he observes. This setting depicts a feature of summary information of posts, in that it does not show the sequential positions of posts. They argue that social learning tends to be slower compared to the situation in which consumers know the sequence of actions. In a different model of social learning, Larson (2015) argues that social learning would be slower in the situations with the averaged information of past actions. Their analyses suggest that, in presenting ratings/reviews, information about sequence could be valuable for social learning, in addition to information about summary statistics or distribution of posts for each grade.

Role of influencers

As discussed in Subsection 2.1, the participation inequality phenomenon, in which only a small proportion of individuals on social media sites actually contribute to contents, is observed. The proportion of senders on a site might depend on the site design. The analysis of Acemoglu, Dahleh, Lobel, and Ozdaglar (2011) indicates that social learning could be hindered if there are excessively influential consumers, such that other consumers only observe those consumers’ actions. Bala and Goyal (1998) also argue that social learning can be hindered by the existence of influential consumers whose past actions are publicly observed, called “royal family.”

3 Marketing tool for marketers

Social media is, originally, a tool for communication between people. However, for firms, it is also a new marketing tool. Firms can use this tool for at least three different objectives: intervention in WOM, information gathering, and advertising. This section discusses these in order.

3.1 Effects of eWOM on firm performance

A feature of social media is making it easy to obtain WOM data. It enables firms to know what customers say about their products. If firms find a diffusion of negative rumors about their products, they may want to counteract them. In other cases, by recognizing that customers barely talk about their products, firms may want to promote WOM. Social media provides clues for those interventions in WOM. However, if WOM has no effect on firm performance, firms would have no reason to attempt to intervene in WOM. This subsection summarizes existing research regarding the effects of eWOM on firm performance, setting the stage for discussing intervention in eWOM in the next subsection.

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8In addition, a consumer observes only a sample of preceding consumers.

9We argue the relation between site design and the participation inequality in more detail in Section 4, in the context of how decision making of a social media could affect the relevant site design.
The availability of communication data from social media sites allows researchers to investigate effects of WOM on sales. In the field of marketing, whether and how WOM could possibly affect sales have been extensively examined with data from social media sites. As argued in the recent meta-analysis by Babić Rosario, Sotgiu, De Valck, and Bijmolt (2016), the results are mixed. There are at least three reasons for this: a variety of metrics representing eWOM, difficulty in identifying causality, and the existence of moderating effects.

**Metrics of eWOM**

When researchers investigate the effects of eWOM on sales with statistical models, postings on social media sites should be summarized into metrics. Researchers choose some metrics from a wide range of alternatives for indexing eWOM. The chosen metrics are not necessarily comparable across studies because of different forms of eWOM across social media sites, such as ratings using five-star scales (e.g., Chintagunta, Gopinath, and Venkataraman (2010)), text messages (e.g., Sonnier, McAlister, and Rutz (2011)), and “likes” on Facebook (e.g., John, Emrich, Gupta, and Norton (2017)). Metrics for different types of eWOM plausibly result in different effects of eWOM on sales.

Even for a particular type of eWOM, alternative metrics can be constructed. For example, for rating types of eWOM—such as five-star scales, which are easier to summarize into indexes than text messages—different metrics (the number of ratings, average rating, variance of ratings, and so on) have been used to investigate the impact of eWOM on sales.

**Identification of causality**

In addition, even for a specific metric of a specific type of eWOM, results have been mixed. For example, earlier studies have found that the volume of online ratings (i.e., the number of ratings) for movies has a positive impact on future box office movie revenues from the analyses with national-level aggregate data (e.g., Liu (2006); Duan, Gu, and Whinston (2008)). Chintagunta et al. (2010) argue about potential problems of using such data under the situation of sequential release of movies across geographical markets. When a movie is released sequentially, both sales and the volume of ratings would increase, even without any impact of online ratings. Using market-level data, the authors find that the volume of ratings insignificantly affects sales.

As suggested in the above example, causality between eWOM and sales is difficult to identify. This is the second cause of mixed results in the literature on the effects of eWOM on sales. One reason for the difficulty is the lack of data on factors that potentially affect both sales and eWOM; for example, quality of products and sales promotion activities. If these factors are not included in the set of explanatory variables in regression analysis of sales, the estimated coefficient of eWOM will be plausibly biased due to omitted variables. Sonnier et al. (2011) investigate the effects of online comments in the form of text messages using the latent instrumental variables method to deal with the endogeneity problem, and found that the valence of comments (i.e., whether comments are positive, negative, or neutral) has significant effects on sales, and that these effects are attenuated when the endogeneity problem is not appropriately addressed. Additionally, Chevalier and Mayzlin (2006) try to empirically identify causality, utilizing data on two rating sites (Amazon.com and Barnes & Noble.com). Specifically, their identification strategy relies
on the differences in ratings and sales for each book between the two sites. The authors find that an improvement in average ratings results in higher sales.

**Moderating effects**

The third reason for mixed results is moderation depending on characteristics of products and/or social media sites. Zhu and Zhang (2010) investigate moderating effects of product types in the context of online ratings for video games. The authors consider two dimensions of game characteristics: online/offline and popular/less popular. Their baseline finding is that ratings have little impact on sales for offline games. For online games, the volume and average of ratings have significant impacts on sales for less popular games, but are insignificant for popular ones. Investigating moderating effects of types of social media sites, as well as those of products, Babić Rosario et al. (2016) conduct a meta-analysis of 96 empirical studies. One finding is that the effects of eWOM on firm performance depend on the type of social media site (review sites or others) and the degree of “homophily,” which means that the site enables eWOM receivers to assess their own similarity to eWOM senders based on username, avatar, profile page, and geographic location. The study also finds that, for review type social media, eWOM has a larger impact when eWOM in a review site is more visible (i.e., a small number of scrolls are needed to access eWOM) or when the display is less structured (i.e., summary of eWOM is not provided).

In summary, although the conditions under which the effects of eWOM on sales become stronger have not been fully understood, there is evidence that eWOM has a positive effect on sales, at least for some types of products on some types of social media sites. If eWOM has these effects, firms may increase their sales by intervening in eWOM, which is the subject of the next subsection.

### 3.2 Intervention in eWOM

Given the effectiveness of eWOM on sales, firms are interested in promoting eWOM. Social media sites provide clues for this purpose in several respects. For one thing, firms can access communication data on social media. Specifically, firms can sometimes identify individuals, and then, contact each individual. This allows firms to target individuals to incentivize or reward them for their contribution to eWOM. Firms can also post messages themselves to promote eWOM, although this could be recognized as manipulative or fraudulent. Below, we discuss the issues of targeting, rewarding, and manipulation, respectively.

#### 3.2.1 Targeting influencers

Promoting WOM through influential individuals is a typical marketing strategy, which is sometimes called “viral marketing.” There is anecdotal evidence for its effectiveness. For example, the huge success of *The Da Vinci Code* by Dan Brown might be attributed to an advance-copy distribution to influential reviewers (Paumgarten (2003)). A practical issue is how to select “influential” consumers to maximize effectiveness. Social network literature proposes various metrics regarding how each consumer could be influential. Given a network model, the metrics are formalized as centrality measures. The simplest class
is degree centrality, in which a node with greater out-degrees (outgoing arcs) is basically treated as more central. Interpreting that an outgoing arc of node A to B expresses a transfer of information from consumer A to B, a consumer with greater out-degrees is considered to be more influential. One feature of degree centrality is not considering any “indirect” influence, such that a consumer with fewer degrees is treated as less influential, even when she/he communicates with a consumer with a large number of degrees. A class of eigenvector centrality enables consideration of “indirect” influences in each manner.\footnote{See \textcite{Jackson2010} for further discussion and other concepts of centrality.}

In a model of information diffusion by a monopolist firm, \textcite{Galeotti2009} argue which consumers to target in viral marketing. The authors suppose that information sent by the monopolist to “targeted” consumers is transferred only once to their direct “neighbors” (consumers who have incoming arcs from the targeted consumers). They argue that targeting individuals with greater out-degrees and fewer in-degrees tends to be effective for diffusing information.

\textcite{Kumar2013} report a successful viral marketing campaign for an ice cream retailer in India.\footnote{In the campaign, the firm incentivized the targeted customers to promote their original flavors. The offline sales data is combined in rewarding customers.} They collect customers’ individual-level communication data from Twitter and Facebook to select their targets. They construct metrics based on a variant of eigenvector centrality, as they observe that some messages are further transferred multiple times. For their data, they report that a message was transferred 3.3 times on average, where the initial sending is counted as 1. In their metrics, the indicated limited feature of the “indirect” effect of the initial message is incorporated through the attenuation factor,\footnote{Their metrics are developed based on the centrality measure introduced by \textcite{Hubbell1965}.} such that a walk of length 2 receives smaller weight than an adjacency.

### 3.2.2 Rewarding feedback

Consumers can post their feedback in the form of ratings/reviews on e-commerce sites such as Amazon or Expedia. It is possible for firms to reward that feedback with a rebate.\footnote{Discussing all aspects of designing online feedback systems is beyond the scope of this article. \textcite{Tadelis2016} provides a survey of this issue.} Firms can rebate depending on the rating (number of stars, positive/negative), or in a non-contingent manner. The contingent type rebate would not be likely to be socially better.\footnote{\textcite{Xu2015} report the existence of contingent type rebates. Some sellers offer rebates only for “positive” feedback, using ads in the delivered packages. Further, some sites provide a service for “buying” positive feedback. We discuss issues of manipulative intervention in the next subsection.} The existing theoretical and empirical studies primarily investigate effects of the non-contingent type.

\textcite{Li2014} provide simple models to examine the consequence of introducing the option of a non-contingent type rebate, in which firms pre-commit either to rebate or not. The authors argue the possible positive effects of the rebate option in two types of models. In a hidden information model where consumers are uncertain about the types of firms (good/bad), the rebate option serves as a signaling device. They also examine a model in which hidden action is combined such that “bad” firms can also produce high-
quality goods if they engage in costly effort. They show that the existence of this option can permit bad firms to engage in costly effort. Overall, they argue that the option is good for buyers. Note that a simplifying assumption for their results is that the rebate induces consumers to provide feedback equally, and consequently, there is no bias in the revealed opinions when all firms choose to rebate.

Cabral and Li (2015) offer an interesting observation in this respect. They conduct field experiments, and find evidence that non-contingent type rebates enhance biased feedback. Particularly, they find that a rebate decreases the likelihood of a negative message even after controlling for the quality of the product. They propose an interpretation that buyers reciprocate the sellers’ “good deeds” (feedback rebate) with less negative feedback. Their analysis indicates a potential negative aspect of rebates inserting bias into the feedback, and thus, impairing learning of the true quality of products.

3.2.3 Manipulation

It is possible for firms to boost positive eWOM with fake or promotional posts, which could mislead consumers’ decision-making. Further, an abundance of those posts would seriously impair the usefulness of the “true” posts made by disinterested consumers. For these reasons, the Consumer Affairs Agency in Japan published a document in 2011 concerning legal issues and notes about online advertising displays. It notes that, when product/service providers post promotional reviews themselves or ask third parties to post, there could be legal issues. Some incidences of fake reviews have been reported in the press. In February 2004, Amazon.com mistakenly disclosed book reviewer identities, revealing that numerous reviews were written by the books’ own publishers and authors (see Harmon (2004)).

Detecting the existence of fake reviews when the true identities of posters are not revealed is an issue. One method is to directly distinguish fake reviews utilizing textual analysis. Although it might be useful to some extent, it would be considerably difficult when fake reviewers become sophisticated in mimicking truthful reviewers. Mayzlin et al. (2014) provide an empirical study that indirectly investigates fake reviews. The authors compare two sites for hotel reviews, Expedia.com and TripAdvisor.com. For the former site, a consumer can post a review only when the hotel was booked, while anyone can post reviews on the latter site. Through this comparison, they find evidence of fake reviews. Their results suggest that reviews for an independent hotel owned by a small owner are manipulated to a greater extent than those for chain hotels with large owners.

The analysis in Mayzlin et al. (2014) indicates a particular bias for posted reviews. However, they do not examine whether and to what extent manipulation, and the associated bias in reviews, could be harmful for consumers and firms, respectively. In this respect, Dellarocas (2006) provides a theoretical study. In a model of hidden information regarding firms’ product quality, the author examines the competition of firms through their costly manipulations. They argue that, in general, manipulation is neither benefi-


\footnote{Mayzlin, Dover, and Chevalier (2014) refer to relevant guidelines in the US and the UK. In 2016, the OECD Council published recommendations in the more general context of electronic commerce, which mentioned that “businesses should not exploit the special characteristics of e-commerce to hide their true identity or location” (OECD (2016)).}
cial for firms or consumers. Manipulation does not serve as signaling for firms with high quality, but firms might still engage in costly manipulation. In this sense, manipulation is largely argued as “waste” for the overall welfare. Note that the author also mentions the possibility of successful signaling, though under a somewhat artificial supposition. They argue signaling is possibly successful when the net marginal gains to firms from higher consumer beliefs is an increasing functions of consumer beliefs. Even in such situations, they argue that signaling becomes unsuccessful when a sufficient number of consumers have already posted reviews (truthfully). Thus, their analysis would indicate the merit of policies that support truthful reviews, together with prohibition of manipulation.

3.3 Information gathering from WOM

As discussed in subsection 3.2, eWOM data is useful for firms to identify influencers so they can intervene in eWOM. Marketers can also gather information from eWOM data on customers’ evaluations of their products and customers’ preferences.

Traditionally, a costly questionnaire survey is needed for a firm to understand consumers’ perception of the firm or its products. Data on eWOM enables the firm to directly know what consumers say about them. For example, understanding how consumers perceive brands is said to be fundamental to most marketing strategies (Culotta and Cutler (2016)). It is costly and time-consuming to obtain data on consumer perceptions with respect to attributes of a brand. Culotta and Cutler (2016) investigate a method for inferring brand perception, such as eco-friendliness, nutrition, and luxury, through surveys. They construct brand perception ratings for attributes by mining the brand’s social connections on Twitter. In their method, the rating of an attribute (e.g., eco-friendliness) is calculated based on how many followers of the brand account also follow the accounts that are related to the attribute (e.g., Greenpeace). They find that ratings obtained with this method have a consistently strong correlation with traditional survey data.

WOM data on social media are also useful for investigating consumers’ preferences, which then can be reflected in firms’ decisions on developing new products or repositioning existing products. Ghose, Ipeirotis, and Li (2012) propose a new ranking algorithm for the hotel industry. Ghose et al. (2012) first construct a hotel characteristics dataset from user-generated contents on several social media sites using text mining and satellite image classification techniques. They then estimate a random coefficients discrete choice model with the product characteristic variables, using the estimated model to evaluate each hotel and create a ranking. Although the objective of Ghose et al. (2012) is constructing hotel rankings, their approach to creating product characteristic variables can be applied to many contexts with demand estimation.

In both cases above, technical issues are inevitable in gathering information from eWOM. In the field of marketing research, several studies investigate how the comments posted online can be adequately measured. For example, Schweidel and Moe (2014) consider how to integrate the insights from multiple social media sites. They point out that it is important to recognize that the nature of what people post is related to where people post. Villarroel Ordenes, Ludwig, De Ruyter, Grewal, and Wetzels (2017) propose a new method to distill consumers’ sentiment from online text messages. Earlier studies tend to rely on single emotion words (e.g., good and awesome). Instead, Villarroel Ordenes et al. (2017) suggest a method using speech act theory in the field of linguistics and the
philosophy of language. For example, it recognizes that some comments implicitly convey positive (e.g., “We got a discount”) or negative (e.g., “We waited for over an hour”) sentiment without the use of any explicit emotion word.

3.4 Advertising on social media

In addition to intervention in eWOM, marketers can also display advertising on social media sites. Customer-level data on social media potentially allows targeted advertising. It might enable marketers to infer customers’ preferences (e.g., that a customer is interested in healthy food) based on their network structure and/or past actions.\textsuperscript{17}

A practical issue for marketers is which type of marketing activities (advertising or WOM) would be more effective for their marketing purpose. Lovett and Staelin (2016) investigate the effects of WOM,\textsuperscript{18} advertising, and firms’ owned websites on firm performance. They estimate a structural model of consumer choice in the context of television viewing. Their results indicate that WOM is more impactful than the others. Bruce, Foutz, and Kolsarici (2012) construct a dynamic demand model to analyze the effectiveness of eWOM and advertisement in the context of the theater-then-video sequential distribution of motion pictures. They find that advertisement is more effective at an earlier stage, and that eWOM becomes more powerful in driving demand at a later stage.

4 Social media as platformers

In Sections 2 and 3, we discussed customers’ uses and marketers’ uses of social media, assuming explicitly or implicitly that services provided for each side are exogenously given. However, they are essentially endogenously determined by social media platformers which are firms pursuing their own profits. In this section, we explicitly discuss decision-making of a social media platform with respect to their services for both side. We first discuss provision of customers’ data toward marketers, and then, discuss the site design that affects the manner of communication between customers.

4.1 Provision of data for marketers

For marketers, social media firms could provide data about customers that could potentially reveal, for example, their preferences, friends, or opinions/views about products. Marketers can use this data for marketing activities, such as targeted advertising, targeting influencers, or extracting their perceptions. In this subsection, we argue about the provision of data first in the context of advertising. We then proceed to discuss other usages.

In general, advertising on a media platform could have both positive and negative effects on customers’ utility.\textsuperscript{19} As an example of a positive effect, informative advertising

\textsuperscript{17}The effects of targeted advertising are discussed in the next section, in the context that a platformer’s decision affects the availability of customer-level data.

\textsuperscript{18}In their survey, respondents were asked whether they had heard from any social contacts (either online or offline).

\textsuperscript{19}Bagwell (2007) provides an extensive survey of the economics literature on advertising.
helps a customer buy the product that she/he desires and has been looking for. However, advertising of products that a customer has little interest in could be annoying, and have a negative effect. In the literature on advertising using traditional media platforms, existing studies reveal the existence of both positive effects (e.g., Rysman (2004) for yellow pages, and Kaiser and Wright (2006) for magazines) and negative effects (e.g., Jeziorski (2014) for radio programs). The key feature of these traditional platforms would be non-targeted; that is, the advertisements on a platform are typically delivered to every consumer who is exposed to its contents.\(^{20}\)

In contrast, customer-level data on social media potentially allows targeted advertising. Targeted advertising could benefit targeted customers by providing informative advertisements, and the other customers by avoiding the nuisance that could have been caused by advertisements. From this perspective, it would be socially desirable for customer data to be fully utilized for matching.\(^{21}\) However, it is not necessarily apparent whether marketers could fully utilize customer data for targeting, when platformers allow marketers to access the data.

Bergemann and Bonatti (2015) theoretically discuss under-provision of data about customers and insufficient targeting in advertising. The authors consider a model where platforms, called data providers, have market power (e.g., monopoly). The data providers have data on customers’ values of products of marketing firms, and sell the data to firms. If a marketing firm obtains the information of the match value of a customer for its product, it can offer the advertisement tailored adequately for her/him (i.e., targeted advertisement); otherwise, it delivers the advertisement for the average customer (i.e., non-targeted advertisement) to her/him. The authors show that even when the data providers have the data on all match values of all combination of customers, the optimal pricing behavior of the data providers could result in insufficient data purchases by marketing firms.

Marketers may want to obtain customer information for purposes other than targeted advertising, as discussed in Subsection 3.3. The accumulation of information by marketing firms could potentially benefit customers by allowing the firms to reflect customers’ needs in developing or repositioning products. We note that market power of social media platforms might undermine the positive effects due to under-provision of data, as implied by Bergemann and Bonatti (2015) in the context of targeted advertising. We also note that, although we have focused on the positive effects of the marketers’ use of social media data, privacy concern is an important issue. For example, Montgomery (2015) documents cases regarding privacy problems on Facebook.

### 4.2 Site design for communication between customers

A social media firm provides communication services for customers. The site design could affect the environment for communication, and thus, affects the customers’ value using the site. For example, Iyer and Katona (2016) theoretically argue that when a social

\(^{20}\)Anderson and Coate (2005) examine equilibrium advertising levels and the welfare implications for commercial broadcasting, which could be interpreted as television or radio. Assuming the net disutility of advertising for each customer, they argue possible excessive advertising compared to the optimal level. Their analysis indicates that advertising could cause considerable disutility for customers.

\(^{21}\)The issue of privacy would be a negative aspect of utilizing customer data, which we ignore for now.
media firm changes its design so as to expand the size of the potential audience (e.g., how far a message reaches—to friends only, or further to friends of friends), competition to acquire attention for each posting becomes severe. As competition for attention becomes severer, it might decrease the customers’ value of using the site.

One may be inclined to posit that a social media firm would design its site to maximize the customers’ value of using it (e.g., design its site to minimize competition for attention); however, it is not necessarily the case, considering the nature of social media firms as platformers. Specifically, the environment for communication might affect profitability of marketing activities against customers using the site, and platformers could charge the marketers from their marketing activities. When a change in the environment for communication increases the customers’ value but decreases profits of marketers, a platformer may not adopt the change. For example, Iyer and Katona (2016) argue that the severe competition to acquire attention results in a small portion of customers being senders of messages. Our discussion in Section 3 suggests that such a situation might be desirable for marketers because they could effectively intervene in eWOM—influencers can be more easily identified, and each influencer is more powerful. A change of site design that serves to attenuate competition for attention might not be adopted when a social media platformer can charge marketers for, say, communication data that is necessary to identify influencers.

As discussed in Section 2, site design potentially affects how well social learning can be processed. Zhang et al. (2015) argue that marketers could prefer “friend-network” to “stranger-network” because social learning is not efficiently processed in the former. This indicates that a platformer with more weight on the values of marketers than on those of customers could design its site in order to facilitate communication among friends, although environment to support communication among strangers are favorable from the perspective of social learning or the customers’ value.

5 Concluding remarks

In this study, we surveyed existing research relevant to social media as a platform for marketing. After discussing customer side in Section 2 and marketer side in Section 3, we discussed the decision-making of social media as a platform in Section 4.

Section 4 suggested that investigating social media as a platform from the welfare perspective is an ongoing research area. Especially, there is scarce research on “higher-order effects” of interaction between customers and marketers. Here the “higher-order effects” refers to the following. Marketers’ use of a social media site for marketing might affect the decision-making of a customer about whether to use the site; the change in the number of the customers of the site, in turn, could affect the intensity of marketers’ use of the site, since customers’ use of the site would be the base of marketers’ profits using the site. Social media platforms plausibly decide their pricing of customers’ data or site design, taking into account these higher-order effects. Research in this direction would be helpful for understanding the behaviors of social media platformers and relevant welfare implications, as well as discussing regulation or competition policy in the social media

\[ ^{22}\text{Although several studies theoretically investigate the pricing structure of platforms considering higher-order effects in the context of traditional media (e.g., Weyl (2010), Armstrong (2006), Rochet} \]
industry.\textsuperscript{23}

The discussion in Sections 2 and 3 also suggests several issues for future research. In Section 2, we argued about several characteristics of social media sites (e.g., types of users, forms to display the contents, and charges for use) that could affect social learning. The existing theoretical studies on social learning, however, largely abstract consumers’ decision-making on whether to send information to others or what to send. In reality, only a part of consumers posts their opinions, and some of them do not post truthfully, as pointed out by empirical studies in marketing. Such self-selection and opinion adjustment behaviors could result in posted opinions being different from the customer base’s overall opinions. Consumers’ posting behavior could be further investigated empirically, and accordingly, the theoretical implications could be further analyzed.\textsuperscript{24}

In Section 3, we discussed marketers’ usages of social media sites. As a type of marketing activities, firms gather information from eWOM; for example, consumers’ evaluation for products. Marketing studies regarding these activities develop techniques to create indexes of product characteristics form eWOM data. Beyond the issues of marketing, these techniques, combined with eWOM data, would be useful. A dataset of product characteristics is often difficult to obtain for researchers. If it can be constructed from eWOM data, it would improve demand estimation, which is a foundation for various policy simulations.

6 Appendix: social learning and herding

In Subsection 2.2, the concept of herding is central to the discussion on social learning. In this section, we outline the basic logic of the occurrence of herding discussed in the literature, presenting a setting based on the works of Banerjee (1992) and Bikhchandani et al. (1992).

Suppose that consumers are placed in a line starting with consumer 1, followed by consumer 2, 3, and so on. We let consumer \( t \) decide in period \( t \) whether to buy one unit of a certain product or nothing. Throughout the decision process, product quality is fixed at either \( H \) (high) or \( L \) (low). When a consumer buys and experiences high quality, she/he receives utility 1, while she/he receives \(-1\) utility in the case of low quality.\textsuperscript{25} When a consumer does not buy, she/he gains zero utility. Assume equal prior probability for the quality level of the product. Consumer \( t \) observes a conditionally i.i.d. binary signal \( \{H, L\} \) in period \( t \), which is correct with probability \( p < 1 \). Consumer \( t > 1 \) also observes the actions of all agents before her/him, while consumer 1 has no one to observe. Each consumer is supposed to rationally infer the quality of the product through combining her/his observations of the past actions and her/his own private signals.

\textsuperscript{23}Government intervention or involvement in the social media industry could be a relevant issue. Qin, Strömberg, and Wu (2017) document basic facts about the involvement of the Chinese government with Sina Weibo, the most prominent Chinese microblogging site.

\textsuperscript{24}To the best of our knowledge, Kondor and Ujhelyi (2005) is an exception that theoretically analyzes social learning under possible self-selection.

\textsuperscript{25}The setting can be further interpreted such that the price of the product is 1, and the high-quality product produces monetary gain of 2, while gain is zero in the case of the low-quality product.
The notable observation is that consumers’ actions will converge almost surely as $t \to \infty$, and there is a positive probability of convergence to the wrong action. In this sense, social learning can fail. To see this, consider consumer 1’s decision problem. When the signal is $H$, consumer 1 decides to buy, while she/he buys nothing when the signal is $L$. Consumer 2 can infer consumer 1’s signal through observing the action. Suppose consumer 2 observes that consumer 1 has bought; she/he then knows the signal of consumer 1 is $H$. When consumer 2 also receives signal $H$, she/he then decides to buy. When consumer 2 receives signal $L$, the signal of consumer 1 is cancelled, so consumer 2 randomizes her/his action. We turn to the decision problem of consumer 3. If both consumer 1 and 2 have chosen to buy, then consumer 3 also chooses to buy irrespective of her/his signal. In the same manner, if both predecessors have chosen not to buy, consumer 3 just imitates their actions. Once two consecutive consumers take the same action, we observe that all subsequent consumers herd on that action.

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