How Does Social Tie Influence the User Information Sharing Behavior in Social Commerce Sites

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Abstract. Social commerce is an extension of e-commerce in which social media is integrated with e-commerce transactions and activities to promote user contributions. Users often learn from others through a social learning process before making decisions related an information contribution or purchase on social commerce sites. Despite the extensive literature on social learning, there is a research gap regarding the impact of various sources on user information sharing behaviors. A majority of the previous studies examined the impact of social learning information from the perspective of friends or other sources (e.g., opinion leaders or friends) without considering their relative impact among different sources. We will conduct a field study and analyze a large-scale data collected from a social commerce site. We expect that friend-network information (i.e., friends' purchase behavior and friends' sharing behavior) and opinion leader-network information (i.e., opinion leaders' purchase behavior and opinion leaders' sharing behavior) have similar effect on user information sharing behavior. Follower-network information has a greatest influence on user information sharing behavior relative to the friend-network information and opinion leader-network information. In addition, the number of followers has a non-linear relationship with user information sharing behavior. This study has important implications for both theory and practice.

Keywords: Social learning · Followers · Opinion leader-network · Friend-network · Social commerce · Information sharing behavior

1 Introduction

1.1 A Subsection Sample

Social commerce is "a subset of e-commerce that involves using social media to assist in e-commerce transactions and activities" (p. 6) [16]. Empowered by ubiquitously accessible and scalable social networks, social commerce enables users to seek product information, share and recommend their favorite products, create product collections, and interact with other shoppers [24]. Stephen and Toubia [21] mentioned that "social

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commerce networks between sellers can play an important economic, value-creating role" (p. 226). That is, they increase the buyers' bargaining power and sellers' profit margin by lowering marketing costs.

In recent years, social commerce is gaining popularity; thus, its adoption rates have significantly increased over the past five years [18]. For example, Pinterest had 175 million monthly active users as of April 2017[1], making it one of the fastest-growing social commerce sites. In 2016, Meilishuo, the leading female-fashion social commerce in China, merged with the second biggest site in China—Mogujie—to create a combined business net worth of RMB 3 billion[2]. Due to the low entry barrier, social commerce sites face intense competition; thus, their survival in this hyper-competitive business environment is highly uncertain [10]. More importantly, without user contributions in terms of product ratings and recommendations or user interactions with other users, social commerce sites are no different than ordinary e-commerce sites and therefore can easily become obsolete as many other e-commerce sites. Given that social commerce sites survival largely depends on user contributions, in this study, we examine how interface design of social commerce sites can stimulate user contribution.

A common belief in the social commerce context is the idea of information cascade, in which individuals are easily influenced by the decisions of others. An individual will observe the referrals or actions others close to him or her, and follow the referrals or behavior of the preceding individuals. This belief sets forth social media marketing strategies to advantage of people's social relationship [22]. Prior research has shown consistent evidence that people tend to mimic others' choices. To this end, a sizable body of research in information systems (IS) and marketing have emerged over the last decade, attempting to identify and examine which type of preceding user is more influential in shaping subsequent user decisions and choices in an online social communities [e.g., 4, 8, 9, 13, 20, 26].

Social commerce has incorporated social networking functions. A user can subscribe to other users' shared posts by following them. This creates a directed social network in which the number of outbound links from a user to others (e.g., opinion leaders) indicates the user's immersion in the community and attention paid to others' shared content [21]. The number of inbound links (i.e., followers) from others to the user indicates their popularity on social commerce site and the amount of others' attention paid to their shared posts [21]. Other type of users (e.g., friends) have a mutually exclusive social connection between two users and thus their interactions are typically bi-directional [6]. In this paper, we explore the information cascade in the context of social comment and, in particular, investigate the relative influence of opinion leaders, friends, and followers on user information sharing behavior.

Prior literature provided mixed findings concerning the impacts of user-generated product information from different sources on subsequent user information sharing

[1] 175 million people discovering new possibilities on Pinterest. Retrieved from https://business.pinterest.com/en/blog/175-million-people-discovering-new-possibilities-on-pinterestKahneman, D. 1973. *Attention and effort*: Citeseer.

[2] Chinese fashion site mogujie acquires meilishuo In $3 billion deal. Retrieved from https://www.forbes.com/sites/ywang/2016/01/10/chinese-fashion-site-mogujie-acquires-meilishuo-in-3-billion-deal/-6b6d2c4b457d.

behavior [6, 25]. Collectively, all of these papers examined the impact of user-generated product information from the perspectives of friends, opinion leaders, and followers without further consideration for their relative impact. To fill this theoretical gap, we intend to answer which source of information has the strongest impact on users' information sharing behavior. We empirically test the relative impacts of information shared by opinion leaders as well as friends and followers, and single out which one is most influential in stimulating user information sharing decision. Furthermore, we will test a non-liner model for follower relationship and investigates the non-linear relationship between the number of followers and user information sharing behavior in social commerce sites.

In this study, data will be crawled from a popular social commerce site in Asia that provides an online platform for users to share with others regarding their personal experience related to a specific product or service. We expected that information sharing behavior of friends and opinion leaders induced subsequent users to share information in social commerce site. In addition, the number of followers has the strongest effect on user information sharing behavior relative to that of friend-network information and opinion leader-network information. This study will provide actionable guidance for marketing practitioners to better manage and utilize user-generated product information and thus increase the information sharing behavior in social commerce sites.

2 Literature Review and Hypotheses Development

2.1 Literature Review on Social Learning

Previous studies have confirmed the significant impact of friends on individuals' behaviors. For example, Feng, Wang and Zhang [6] found that online friends rather than informants exerted greater conformity pressure, motivating consumers to generate similar product ratings. In the movie industry context, Lee, Hosanagar and Tan [13] also documented a more robust conformity phenomenon in friend relationships; that is, relative to prior ratings by strangers, friends' ratings always induced herding regardless of movie popularity. Recently, using a quasi-experimental design, Wang, Zhang and Hann [26] showed that rating similarity between friends was significantly higher after the friend relationship was established, indicating that users' earlier ratings could exert social influence on their friends' later rating even beyond the taste similarity among them (i.e., the homophily effect).

Existing evidence has also showed that opinion leaders could disproportionately influence subsequent users' decision in multiple ways. As a result of the knowledge capital possessed by opinion leaders, Iyengar, Van den Bulte and Valente [9] found that better connected adopters (i.e., opinion leaders) exerted more influence on new product diffusion than less connected ones even after controlling for marketing effort and arbitrary system wide changes. Similarly, van Eck, Jager and Leeflang [23] demonstrated that opinion leaders were less susceptible to norms and more innovative, which subsequently facilitated the adoption process of new products.

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2.2 Social Learning and User Sharing Behavior

The *social learning process* refers to a user updates his or her belief of a behavior via signals (e.g., observations of use and observations of purchase) on information that was received from others [12]. We focus on social learning that operates through signals from observations of purchase (i.e., purchase behavior) and observations of sharing (i.e., sharing experience). In particular, we examine three types of relationship between users in social commerce sites, including ones with opinion leaders (i.e., following relationship), friends (i.e., friendship), and followers (i.e., being followed relationship). The first type, *opinion leader-network*, refers to a group who are normally interconnected and have a higher status, education, and social standing and therefore exert a disproportionate amount of influence on social networks [7, 14, 15, 26]. A user's relationship with an opinion leader is typically described as "one-way" information-based, in which the user initiates a follow connection to the opinion leader to access the updates of the opinion leader's activities [6]. The second type of users, *friend-network,* by contrast, are a mutually exclusive social connection between two users where their interactions are typically bi-directional [6]. The third type of users, *follower-network* are the users with inbound links (i.e., followers) from others to the user indicates their popularity on a social commerce site and the amount of others' attention paid to their shared posts [21].

A great of attention has been paid to the social learning theory introduced by Banerjee [2]. Social learning theory poses that individuals learn by observing the behaviors of others [3]. According to this theory, observational learning information contains the discrete signals expressed by the actions of other users but not the reasons behind their actions. When people observe the actions of all previous users, this publicly observed information outweighs their own private information in shaping their beliefs. As a result, people follow their predecessors' actions and become engaged in a type of herd behavior [2]. Therefore, we hypothesize:

H1. Opinion leaders-network information (i.e., friends' sharing behavior and friends' purchase behavior) has significant influence on user sharing behavior.
H2. Friends-network information (i.e., friends' sharing behavior and friends' purchase behavior) has significant influence on user sharing behavior.
H3. Followers-network information (i.e., number of followers) will exert significant influence on user sharing behavior.

2.3 Friend-Network Versus Opinion Leader-Network Versus Follower-Network

Network and the embedded relationships are critical determinants of how people communicate and form belief [27]. In social commerce sites, when users generate updates (e.g., purchase a new product), those updates will be display to their friends and followers, but not to the opinion leaders. To this end, a user's performance will be visible or be known only to friends and followers, but not to opinion leaders. Given that visibility of performance is a determinant of social learning, following the information by a friend provides a user with an opportunity to manage his or her public image and signal his or her desire for establishing social intimacy to others.

In comparison, following the information by an opinion leader will not be visible at all; hence, this is not conductive in maintaining social bonds with the opinion leader [27]. Acemoglu et al. [1] studied a theoretical observational learning model over a general social network. The findings showed that people observe only subsets of their predecessors. Conventional wisdom suggests that the consumer is more likely to emulate his/her friends. Individuals tend to follow their friends in decision such as which movie to watch and which political candidates to vote for [17, 19].

In social commerce sites, friendship is a closer relationship compared to opinion leader relationship and follower relationship, individual know their friends and trust them more. Zhang, Liu and Chen [27] examined observational learning in the social network of friends versus strangers. They found that information cascades are more likely to occur in friend networks than in stranger networks. Feng, Wang and Zhang [6] found that online friends rather than informants exerted greater conformity pressure, motivating consumers to generate similar product ratings. In the domain of movie industry, Lee, Hosanagar and Tan [13] also documented a more robust conformity phenomenon in friend relationships; that is, relative to prior ratings by strangers, friends' ratings always induced herding regardless of movie popularity.

Using a quasi-experimental design, Wang, Zhang and Hann [25] showed that rating similarity between friends was significantly higher after the friend relationship was established, indicating that users' earlier ratings could exert social influence on their friends' later rating even beyond the taste similarity among them (i.e., the homophily effect). Conversely, existing evidence has also implied that opinion leaders could disproportionately influence subsequent users' decision via multiple ways. As a result of the knowledge capital possessed by opinion leaders, Iyengar, Van den Bulte and Valente [9] found that the better connected adopters (i.e., opinion leaders) exerted more influence on new product diffusion than do less connected ones even after controlling for marketing effort and arbitrary system wide changes. Similarly, van Eck, Jager and Leeflang [23] demonstrated that opinion leaders were less susceptible to norms and more innovative, which subsequently facilitated the adoption process of new products. Therefore, we hypothesize,

H4. Friends-network information will exert the strongest influence on user sharing behavior than will opinion leaders-network information and followers-network information.

3 Methodology

3.1 Data Collection

The data for this study will be crawled from a social commerce site in Asia, which provides a platform for users to share their experience, and to interact with other users. We will randomly select users from 42 groups.

Users in the social commerce site can post the experience that they have had with the use of any product, provide a rating (from 1 to 7) on the product, and share the products that they have purchased by adding products to their "buy" lists. Users can also choose to "follow" other users whose posts or ratings are useful in the social commerce site. The following relationship does not need mutual consent, nor has to be reciprocal. The number of followings a user has indicates his/her immersion in the social commerce site. The number of followers a user has indicates his/her popularity. Furthermore, the social commerce site enables users to observe following users' behaviors (i.e., purchase behavior and rating behavior).

In this study, we aim to explore how a user's sharing behavior is influenced by other users' sharing and purchase (i.e., including friends and opinion leaders) as well as number of followers. Based on users ID, we crawled the network data for each user. Specifically, we collected the "following" (i.e., opinion leaders), "friends" and "followers" of users' lists and built an egocentric network for each user. Then we formed friends-based behavior (i.e., friends' sharing and friends' purchase) and opinion leaders-based behavior (i.e., opinion leaders' sharing and opinion leaders' purchase).

3.2 Operationalization of Constructs

The constructs included in the research model are operationalized as follows:

Opinion leaders' sharing is operationalized as the total number of experience (on products) provided by user' followings (exclude reciprocal following relationship).
Friends' sharing is operationalized as the total number of experiences provided by individuals who are reciprocal followed by a user, or the user's friends.
Opinion leaders' purchase is operationalized as the total number of products in the buy-lists of a user's followings in the social commerce site.
Friends' purchase is operationalized as the total number of products in the buy-lists of a user's friends in the social commerce site.
Followers is operationalized as the total number of users followed the focal user.
User sharing behavior is operationalized as the number of experience a user shared in social commerce site.

4 Conclusion

This paper addresses the influence of social learning on users sharing behavior, and whether this differs in networks of friends, opinion leaders, or followers. We will use a field study to test the research model. We expect that observing opinion leaders and

friends' actions encourage user share more information. This study contributes to the existing literature by offering important and interesting insights to research and practice.

References

1. Acemoglu, D., Dahleh, M.A., Lobel, I., Ozdaglar, A.: Bayesian learning in social networks. Rev. Econ. Stud. **78**(4), 1201–1236 (2011)
2. Banerjee, A.V.: A simple model of herd behavior. Q. J. Econ. **107**, 797–817 (1992)
3. Çelen, B., Kariv, S.: Distinguishing informational cascades from herd behavior in the laboratory. Am. Econ. Rev. **94**(3), 484–498 (2004)
4. Dewan, S., Ho, Y.-J.I., Ramaprasad, J.: Popularity or proximity: characterizing the nature of social influence in an online music community. Inf. Syst. Res. **28**(1), 117–136 (2017)
5. Fang, E., Palmatier, R.W., Steenkamp, J.-B.E.: Effect of service transition strategies on firm value. J. Mark. **72**(5), 1–14 (2008)
6. Feng, Y.K., Wang, C.A., Zhang, M.: The impacts of informant and friend relationships on online opinion sharing (2013)
7. Flynn, L.R., Goldsmith, R.E., Eastman, J.K.: Opinion leaders and opinion seekers: two new measurement scales. J. Acad. Mark. Sci. **24**(2), 137–147 (1996)
8. Herrando, C., Jiménez-Martínez, J., Martín-De Hoyos, M.J.: Passion at first sight: how to engage users in social commerce contexts. Electron. Commer. Res. **17**(4), 701–720 (2017)
9. Iyengar, R., Van den Bulte, C., Valente, T.W.: Opinion leadership and social contagion in new product diffusion. Mark. Sci. **30**(2), 195–212 (2011)
10. Kassim, E.S., Othman, A.K., Zamzuri, N.H.: Strategies for sustainable social commerce: the roles of customer focus, innovative business model. Leg. Trust. Inf. J. **19**, 2907–2912 (2016)
11. Kohtamäki, M., Partanen, J., Parida, V., Wincent, J.: Non-linear relationship between industrial service offering and sales growth: the moderating role of network capabilities. Ind. Mark. Manag. **42**(8), 1374–1385 (2013)
12. Lee, J.Y., Bell, D.R.: Neighborhood social capital and social learning for experience attributes of products. Mark. Sci. **32**(6), 960–976 (2013)
13. Lee, J.Y., Hosanagar, K., Tan, Y.: Do I follow my friends or the Crowd? Information cascades in online movie ratings. Mark. Sci. **61**(9), 2241–2258 (2015)
14. Li, F., Du, T.C.: Who is talking? An ontology-based opinion leader identification framework for word-of-mouth marketing in online social blogs. Decis. Support Syst. **51**(1), 190–197 (2011)
15. Li, Q., Liang, N., Li, E.Y.: Does friendship quality matter in social commerce? An experimental study of its effect on purchase intention. Electron. Commer. Res. **18**(4), 693–717 (2018)
16. Liang, T.-P., Turban, E.: Introduction to the special issue social commerce: a research framework for social commerce. Int. J. Electron. Commer. **16**(2), 5–14 (2011)
17. Moretti, E.: Social learning and peer effects in consumption: Evidence from movie sales. Rev. Econ. Stud. **78**(1), 356–393 (2011)
18. Olbrich, R., Holsing, C.: Modeling consumer purchasing behavior in social shopping communities with clickstream data. Int. J. Electron. Commer. **16**(2), 15–40 (2011)
19. Sinha, R.R., Swearingen, K. Comparing recommendations made by online systems and friends. In: DELOS Workshop: Personalisation and Recommender Systems in Digital Libraries (2001)

20. Sotiriadis, M.D., Van Zyl, C.: Electronic word-of-mouth and online reviews in tourism services: the use of twitter by tourists. Electron. Commer. Res. **13**(1), 103–124 (2013)
21. Stephen, A.T., Toubia, O.: Deriving value from social commerce networks. J. Mark. Res. **47** (2), 215–228 (2010)
22. Trusov, M., Bucklin, R.E., Pauwels, K.: Effects of word-of-mouth versus traditional marketing: findings from an internet social networking site. J. Mark. **73**(5), 90–102 (2009)
23. van Eck, P.S., Jager, W., Leeflang, P.S.H.: Opinion leaders' role in innovation diffusion: a simulation study. J. Prod. Innov. Manag. **28**(2), 187–203 (2011)
24. Wang, C., Zhang, P.: The evolution of social commerce: the people, management, technology, and information dimensions. CAIS **31**, 5 (2012)
25. Wang, C., Zhang, X., Hann, I.-H.: Socially nudged: a quasi-experimental study of friends' social influence in online product ratings. Inf. Syst. Res. **29**, 641–655 (2018)
26. Wang, C.A., Zhang, X.M., Hann, I.-H.: Social bias in online product ratings: A quasi-experimental analysis. In: The Workshop on Information Systems Economics, St. Louis, 2010 (2010)
27. Zhang, J., Liu, Y., Chen, Y.: Social learning in networks of friends versus strangers. Mark. Sci. **34**(4), 573–589 (2015)