

# Social Influence on Being a Pay User in Freemium-based Social Networks

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**Abstract**—Social networks based on free plus premium (freemium) business model offer basic services for free, while charging premium for advanced features with added value to a small subset of users. While a large loyal user base is indispensable, social connections and interactions with people paying for premium services may, to a great extent, influence the probability of free users to become pay users. We perform an empirical study on the probability of being a pay user under the social influence of pay users in the 59 million friend pairs of Flickr and 61 million friend pairs of Last.FM users, from the influence of pay users in the 40 million Flickr photo favorite interactions and from the influence of pay users in the 59 million Flickr photo comment interactions. With the same number of pay users in the three types of social influence, we find that influence from pay users in one's friend circle is overwhelmingly higher, followed by that from pay users in photo favorite interactions and that from pay users in photo comment interactions. The greater the number of pay users in the three types of influence, the more likely that a user would be a pay user, however there seems to be a limit upon which no additional benefit is reaped. The results can be used to help freemium-based social networks improve and promote the premium features, to attract more users to pay for it.

**Keywords**—Freemium; business model; social influence; willingness to pay; social network

## I. INTRODUCTION

The popularity of online social networks (OSN) continues to grow with giants like Facebook and Twitter having gained a large and passionate user base. Now it is time for OSNs to think about how to monetize their addictive services [1, 2]. Currently, the most important and profitable revenue for most of the OSNs comes from online advertising [1]. However, OSNs are far more powerful and liberating than traditional media to be an appropriate advertising platform [3]. OSNs like Flickr and Last.FM have clearly decided to run their business on free plus premium model (freemium) offering advanced services for a subscription fee.

Freemium-based OSNs offer their basic services away for free, mostly being financially supported by advertisements, while charging premium by providing advanced features with added value to a smaller subset of users [4, 5]. For example, Flickr charges \$24.95 for a 1 year pro account for pay users to provide *unlimited* photo uploads and storage, *unlimited* photo sets and collections, *ad-free* photo browsing and sharing and access to the *original* photos. Last.FM charges €3 per month to offer *unlimited* radio streaming, *ad-free* music browsing and

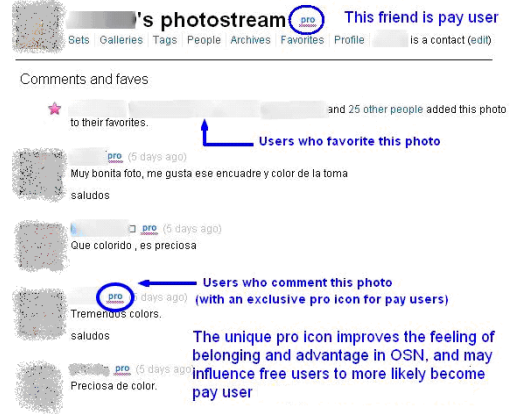


Figure 1. Three types of social influence from pay users in Flickr: pay friends, pay users who favorite one's photos, and pay users who comment on one's photos.

streaming and a list of *recent visitors* that view a pay users' profile. Other freemium-based OSNs also include LinkedIn, Multiply.com, XING.com and classmates.com.

While a large loyal user base is indispensable [6] for freemium-based OSNs, the word of mouth diffusion [7] of the premium services is also pivotal. Users in OSNs tend to adopt behaviors that are exhibited and adopted by those who are their friends [8, 9] or whom they have social interactions with [10, 11]. So, *social connections* and *interactions* with people paying for premium services may, to a great extent, increase the probability of free users to become a pay user. In this paper, we regard the phenomenon that free users become pay users under the word of mouth diffusion from pay users about premium services as a form of social influence. Using several large scale datasets crawled from Flickr and Last.FM, we perform an empirical study on a user's probability of being a pay user under three types of influence as shown in Fig. 1:

- Social influence from pay users who are friends of a Flickr/Last.FM user (*social connections*).
- Social influence from pay users who favorite a Flickr user's photo (*social interactions*).
- Social influence from pay users who comment a Flickr user's photo (*social interactions*).

We find that with the same number of pay users in the three types of social influence, influence from pay users in one's friend circle is overwhelmingly high, followed by that from pay users in photo favorite and comment interactions. We also find that a user is most likely to be a pay user as the number of pay users increases in each of the three types of influence. However, there appears to be

an upper bound on the number of pay users that influence and increase the probability of a free user to become a pay user, before there is no added benefit.

The rest of this paper is organized as follows. Section 2 describes the characteristics of the large scale datasets crawled from Flickr and Last.FM. Section 3 presents the results of the probability of being a pay user from the aggregated users' point of view, under the three types of social influence described earlier. Section 4 gives related work, and Section 5 concludes the paper with future work.

## II. DATASET DESCRIPTION

We study the social influence from pay users on the probability of being a pay user using aggregated datasets on social connections and interactions in Flickr (photo sharing OSN) and Last.FM (music OSN). The large scale datasets were collected from Flickr and Last.FM using their public APIs under compliance with the terms of use of the APIs. The overview characteristics of the datasets are described in Table 1.

The Flickr friend crawler uses several random seed users and gets the profile of each seed and the information if the seed is a pay user, then gets the friend list of each user and the profile of each friend. Then, the crawler follows a Breadth First Search (BFS) rule to discover other users. This crawler collects 298,797 user profiles and their friend lists, together with 59,092,937 friend profiles. The Last.FM friend crawler works similarly and collects 249,998 user profiles and their friend lists, together with 61,257,271 friend profiles.

While the Flickr friend crawler runs, the Flickr photo favorite crawler and the Flickr photo comment crawler work in parallel. To study the influence of pay users in photo favorite interactions, the Flickr photo favorite crawler randomly selects 74,312 users from the 298,797 Flickr users above, obtains their photos, and crawls all the favorite links on these photos. This results in a total of 7,968,449 photos and 40,682,802 favorite links on these photos. From the 40,682,802 favorite links, we obtain the profile for each of the users who favorite the photos.

For studying the influence of pay users in photo comment interactions, we take the above randomly selected users and their photos and use the Flickr photo comment crawler which collects all the comment links on these photos. By excluding the photo owners from the commenters (photo owner himself replies to others' comments on her photos), we have 59,068,253 comment links and obtain the profile for each of the users who comment on the photos.

TABLE I. DATASET CHARACTERISTICS FOR STUDYING SOCIAL INFLUENCE OF PAY USERS IN FLICKR AND LAST.FM

	Friends		Favorite Flickr photo	Comment on Flickr photo
	Flickr	Last.FM		
Users	298,797	249,998	74,312	74,312
Friends	59,092,937	61,257,271		
Photos			7,968,449	7,968,449
Interactions			40,682,802	59,068,253

## III. SOCIAL INFLUENCE ON BEING A PAY USER

In this section, we use both the absolute number and the relative rate of pay users that one has social connections and interactions with, to study the three types of social influence as described in the Introduction from pay users on the probability of a user being a pay user.

### A. Influence from pay users in one's social friend circle

Fig. 2 (a) shows the probability of being a pay user for a user with different number of pay friends in Flickr and Last.FM. Generally, with the same number of pay friends, users in Flickr are about three times more likely to be a pay user than users in Last.FM. We notice that the marginal benefit of having a second pay user in one's friend circle in both Flickr and Last.FM is particularly strong, as we have the probability of being a pay user for users with two pay friends about one and half times higher than the probability of being a pay user for users with only one pay friend. The plots mainly show sublinear increase, therefore diminishing benefit returns are exhibited.

The two plots in Fig. 2(a) give qualitatively similar shapes and it is very clear that the more pay friends a user has, the more likely the user would be a pay user, especially for Flickr users who have pay friends less than a thousand and for Last.FM users who have pay friends less than a hundred. Note that the X-axis of the plots is in its log scale form, the above trend is very close to logarithmic distribution, which forms an interesting contrast to the "S-shaped" curve in modeling diffusion of innovations where the probability of spreading and adopting new ideas and technology follows a logistic function [12].

We get close fits to the logarithmic distributions for the probability of being a pay user in Fig. 2 (a) using  $y=0.12428+0.09636\ln x$  for Flickr and  $y=-0.00857+0.081\ln x$  for Last.FM, as shown in Fig. 2 (b). The two good fittings are approached for Flickr users with no more than 200 pay friends (containing 87.2% of users) and Last.FM users with no more than 30 pay friends (containing 97.6% of users). The selected users in the logarithmic fittings are reasonable and catches behavior of most of the users, as shown in Fig. 2 (c) in which the Cumulative Distribution Function (CDF) of the number of friends who are pay users in Flickr and Last.FM are plotted, respectively.

The absolute number of pay friends one has, presents a great effect on his/her probability of being a pay user. It is also necessary to consider the effect of the percent of pay users in one's friend circle on that probability. Fig. 3 (a) shows that as the percent of pay users among one's friends increases, the probability of being a pay user for users in that percent range rises straightly for the vast majority of users in Flickr. For Last.FM, it rises straightly at the small percent of pay friend and then very slowly increase with fluctuations at a moderate probability. It sounds reasonable that as a user adds more pay users as her friends and increases her percent of pay friends over all friends, he would be more likely to become a pay user under the influence from the high percentage of pay friends.

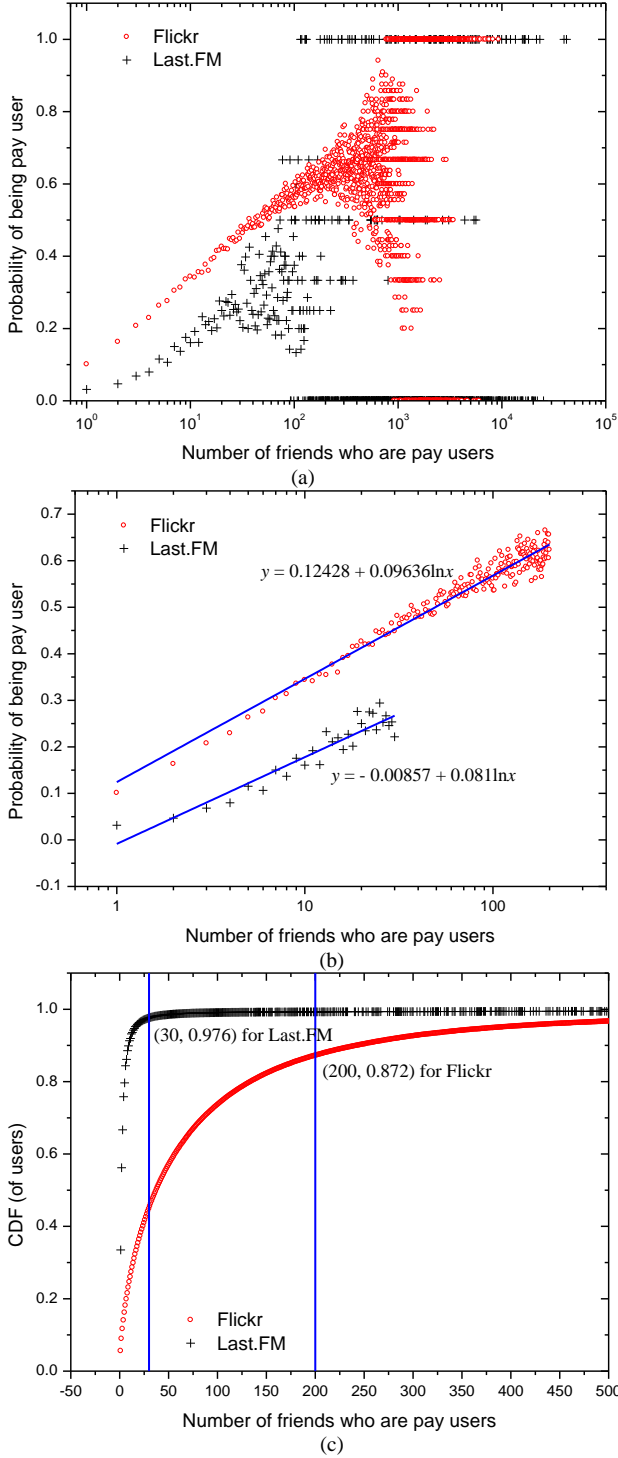


Figure 2. Influence under number of pay friends with (a) probability of being pay user, (b) logarithmic fitting and (c) CDF of users for pay friends.

A strange fact in Fig. 3 (a) is that the probability of being a pay user for Flickr users whose percent of pay friends is larger than 0.95, sharply decreases to a very low level. This fact also applies to Last.FM users whose percent of pay friends is larger than 0.8. We hypothesize

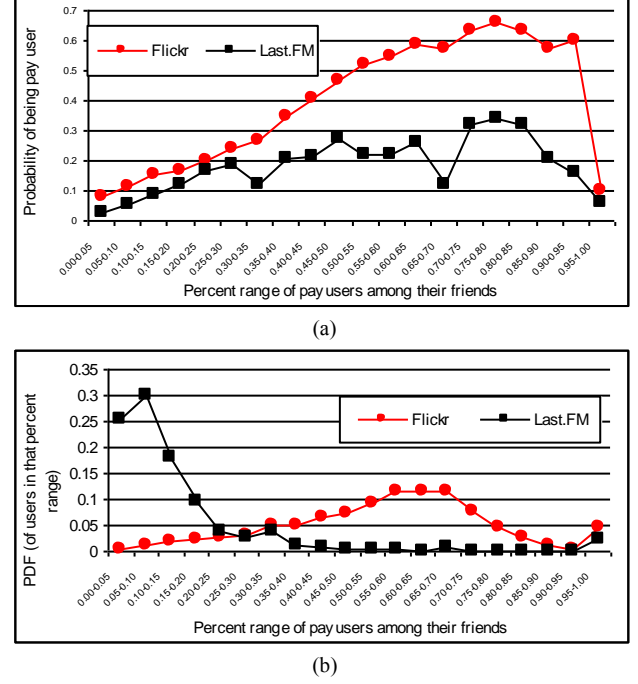


Figure 3. Influence under percent range of pay friends with (a) probability of being pay user, (b) PDF of users in each percent range of pay friends.

that this may be due to random fluctuation caused by very few extreme free users who only try to add pay users as friends no matter whatever the user generated content produced by the pay Flickr users that add or the music taste shared between the pay Last.FM users that add as friends. We give the Probability Density Function (PDF) of users in each percent of pay friends in Fig. 3 (b). For Flickr, users with percent of pay friends in the range from 0.4 to 0.8 occupy a considerable part of the total population. However, for Last.FM, it seems that most of the users have a small percent of pay friends less than 0.2. As there are very few Last.FM users whose percent of pay friends is in the range of [0.7, 0.95], our above hypothesis seems reasonable for Last.FM users whose percent of pay friends is within [0.7, 0.95]. Since the percent of Flickr users and Last.FM users whose percent of pay friends is larger than 0.95 is not too small (4.7% for Flickr and 2.3% for Last.FM) to present the random result, there must be other reasons for the sharp decrease in the probability of being a pay user for these Flickr and Last.FM users, if the hypothesis about random fluctuation above is not wrong. We leave this analysis of this strange fact for our future work.

### B. Influence from pay users in photo favorite interaction

When considering the influence on the probability of being a pay user from pay users in Flickr photo favorite interactions, we take two metrics. One is the number of a user's photos that are favorited by pay users, while another is the number of (unique) pay users who favorite a user's photos. A hypothesis here is that the two metrics have different role in influencing the owner of the favorited

photos in becoming a pay user. For example, a photo can be favorited by many different pay users, while a pay user can favorite many different photos uploaded by one user. The similar metrics and hypothesis related to influence from photo comment interactions are also used in the next subsection.

Fig. 4 (a) shows the CDF and PDF of users for the two metrics, from which we know that in Flickr, the number of users with less than 100 pay users that favorite their photos is greater than the number of users with less than 100 photos favorited by pay users, while for the X-axis value larger than 100, the fact is opposite. Since it covers 100% of the total population for users with less than 10000 photos favorited by pay users and 98.7% of the total population for users with less than 10000 pay users that favorite their photos, Fig. 4 (b) plots how the probability of being a pay user changes over different number of photos favorited by pay users and different number of pay users that favorite the photos. Although no clear pattern is apparent as in pay friends' influence on the probability of being a pay user (shown in Fig. 2 (a)), a user with a certain number of pay users that favorite her photos is generally more likely to be a pay user, compared with a user with the same number of photos favorited by pay users. This is further verified in Fig. 4 (c), which gives the rate of probability of being a pay user for one with a certain number of pay users that favorite her photos over the probability for one with the same number of photos favorited by pay users. In Fig. 4 (c), 73.3% of the rates are higher than 1. Note that Fig. 4 (c) only shows the rate for X-axis up to 450, covering 79.6% of users where at least one of whose photos are favorited by pay users and 93.1% of users whose photos are favorited by at least one pay user.

In addition, Fig. 4 (b) shows that as the number of pay users that favorite one's photos and the number of one's photos favorited by pay users increase, the likelihood of the user being a pay user increases. From the left-upper figure in Fig. 4 (b), we find the marginal benefit of having a second pay user that favorite one's photos is also strong, as we have the probability of being a pay user for a user with two pay users that favorite her photos is about one and a half times the probability of being a pay user for a user with only one pay user that favorite her photos. However, the noticeable marginal benefit is not found when having a second photo favorited by a pay user after a user already has one photo favorited by a pay user.

Furthermore, from the left-upper embedded figure in Fig. 4 (b), we find that the probability of being a pay user for users with only one photo favorited by a pay user is higher than that for users with only one pay user who favorites on their photos. The phenomenon is credible and reasonable because users with only one photo favorited by a pay user may have a chance to interact with more than one pay user, since a lot of pay users can favorite this only one photo. However, for users with only one pay user that favorites their photos, they interact with only one pay user, even though only one pay user may favorite a lot of their photos. Thus, users have a relatively large social circle

with more pay users to interact with and then increasing the probability of being a pay user.

Similar to the study on impact of the percent of pay friends among all of a user's friends on the probability of a user being a pay user in Fig. 3, Fig. 5 (a) shows the probability of being a pay user under two forms of percent range: (1) among all the users that favorite one's photos, the percent equals the number of pay users divided by the

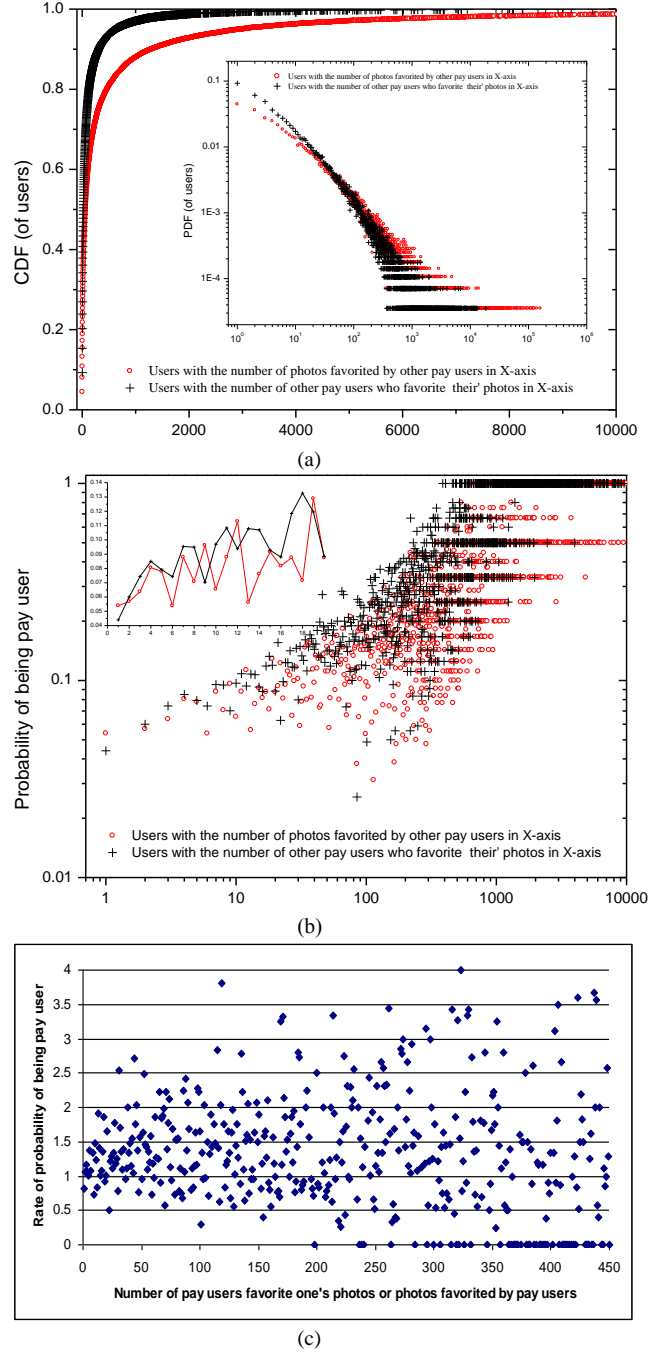


Figure 4. Influence from pay users in Flickr photo favorite interactions with (a) CDF and PDF of users with certain number of pay users who favorite on their photos and users with certain number of photos favorited by pay users, (b) probability of being a pay user, (c) rate of probability

total number of the users, (2) the percent equals the number of one's photos favorited by pay users divided by the total number of one's photos that are favorited at least

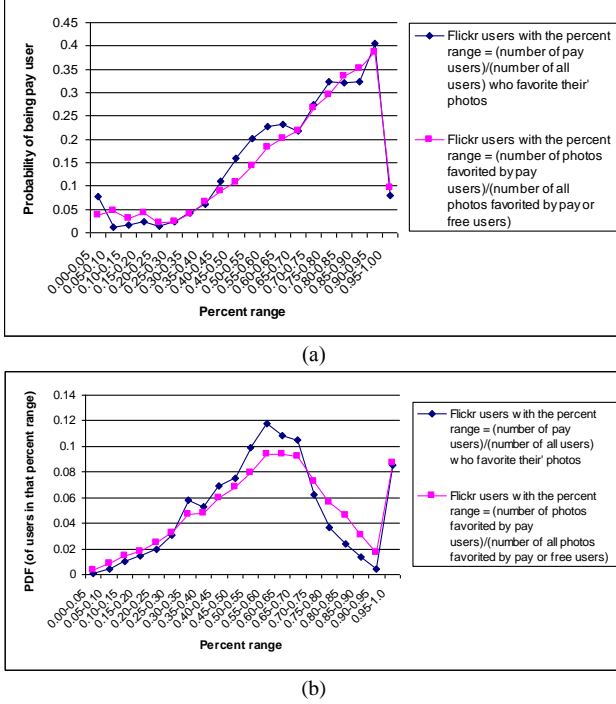


Figure 5. Influence under two types of percent in Flickr photo favorite interactions with (a) probability of being a pay user, (b) PDF of users.

by one user. The two probabilities in Fig. 5 (a) look very similar and overlap each other when rising as the percent increases. However, for the majority part of the percent range from 0.35 to 0.7 (accounting for 69.1% of users in the first form of percent and 65.5% of users in the second form of percent, as shown in PDF of users with the two forms of percent in Fig. 5 (b)), the probability of being a pay user for users in the first form of percent range is evidently higher than that for users in the second form of percent range.

In addition, we notice that the two forms of percent range [0.35, 0.4] both act as a kind of threshold. The probability of being a pay user for users whose two percent ranges are smaller than the threshold does not change too much. But once the two percent ranges increase larger than the threshold, the probability of being a pay user will rise straightly. This is different from that of Flickr users shown in Fig. 3 (a) where the probability continues increasing until 0.95. However, similar to Fig. 3 (a), the strange fact appears again, showing that Flickr users with the two forms of percent range larger than 0.95 have a sharp decreasing probability of being a pay user. The strange fact is not caused by random fluctuation from very few extreme users, as Fig. 5 (b) shows that more than 8.5% of users are in the percent range [0.95, 1] for both cases.

### C. Influence from pay users in photo comment interaction

Fig. 6 (a) shows the CDF and PDF of users with number of pay users that comment on their photos and with number of photos commented by other pay users, and Fig. 6 (b) plots the probability of being a pay user for users described in Fig. 6 (a). Fig. 7 (a) shows the PDF of users within a certain percent range defined similarly as that in the previous subsection, and Fig. 7 (b) gives the probability of being a pay user for users within different percent range. From the figures, the probability of being a pay user under social influence from pay users in photo comment interactions are very similar to that from pay users in photo favorite interactions. We do not explain the result here in detail, but just highlight the findings as follows.

A Flickr user with a certain number of pay users that comment on her photos are generally more likely to be a pay user than a user with the same number of her photos commented by pay users. The marginal benefit of having a second pay user who comment on one's photos is also strong, as the probability of being a pay user for a user with two pay users that comment on her photos is more than one and half times higher than the probability of being a pay user for users with only one pay user that comment on her photos. However the marginal benefit is not found when having a second photo commented by a

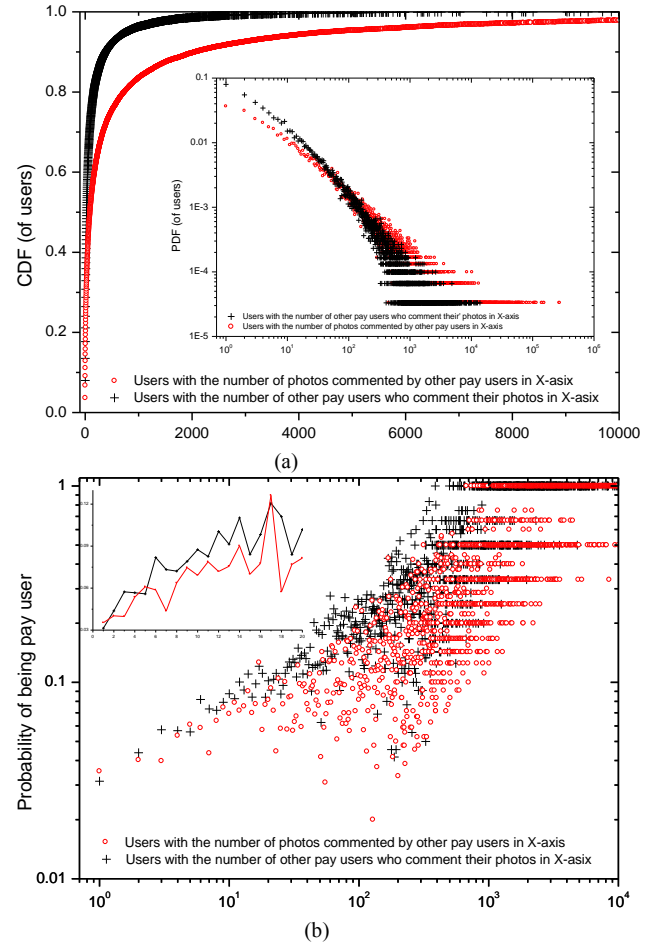


Figure 6. Influence from pay users in Flickr photo comment interactions with (a) CDF and PDF of users with certain number of pay users who comment on their photos and users with certain number of photos commented by pay users, (b) probability of being a pay user.



pay user after a user already has one photo commented by a pay user. Similarly, the probability of being a pay user for users who have only one photo commented by a pay user is higher than that for users with only one pay user that commented on their photos. The probability of being a pay user increases straightly as the percent of pay commenters and the percent of photos commented by pay users rise, until the two percents approach 0.95 where the mentioned strange fact appears again. A slight difference is that for the influence from photo comment interactions, there is no percent threshold, before and after which the probability of being a pay user has different trends as found in influence from photo favorite interactions in the previous subsection.

#### D. Comparison of the influence from different sources

Finally, we want to make a comparison of probability of being a pay user among different types of social influence and different considerations of metrics, to investigate what type of social influence from pay users are most important for a user to improve her willingness to pay for premium-based advanced social features.

We do not directly compare the probability of being a pay user under the three types of social influence due to difficulty in differentiating them from each other. Instead, we present the cumulative-like probability of being a pay user in Fig. 8 (a) and then divide the cumulative-like of probability by the value of X-axis and show them in Fig. 8 (b). The range for Fig. 8 X-axis is limited to 1000, which covers 99% (99.6%) of Flickr (Last.FM) users that have at least one pay friend, 97.1% of Flickr users that have at least one pay user who favorites their photos, 87.9% of

Flickr users that have at least one photo favorited by pay users, 96.2% of Flickr users that have at least one pay user who comments on their photos and 82.4% of Flickr users that have at least one photo commented by pay users.

From Fig. 8 (a), for Last.FM, the influence from pay friends keeps rising linearly as the number of pay friends increases until to about 130, and after that, the influence rises very slowly. We clearly find that except Last.FM, all other five curves of cumulative-like probability of being a pay user increase linearly as the number of pay users in one's friend circle, in one's photo favorite and comment interaction increases, and as the number of one's photos favorited or commented by pay user increase. The value of slopes of the above five curves illustrate the efficacy of different types of social influence from pay users. Generally, with the same number of pay users among one's friends, among one's photo favorite or comment interactions, the most dominant influence on a user being a pay user, comes from pay friends, followed by influence from pay users who favorite one's photos and then influence from pay users who comment on one's photos. Afterwards, with the same number of photos favorited by pay users and commented by pay users, the influence from pay users in photo-favorite interactions is greater than that from pay users in photo-comment interactions. To credible

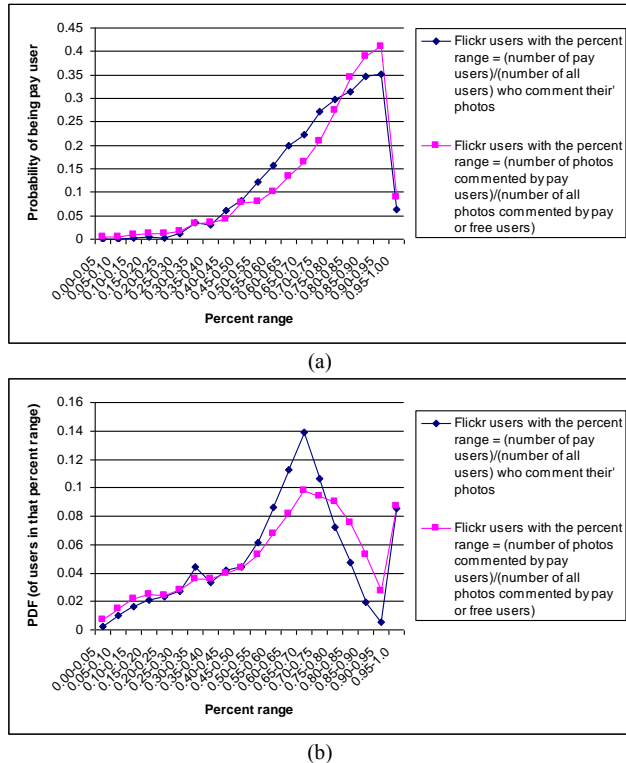


Figure 7. Influence under two percent ranges in Flickr photo comment interactions with (a) probability of being pay user, (b) PDF of users

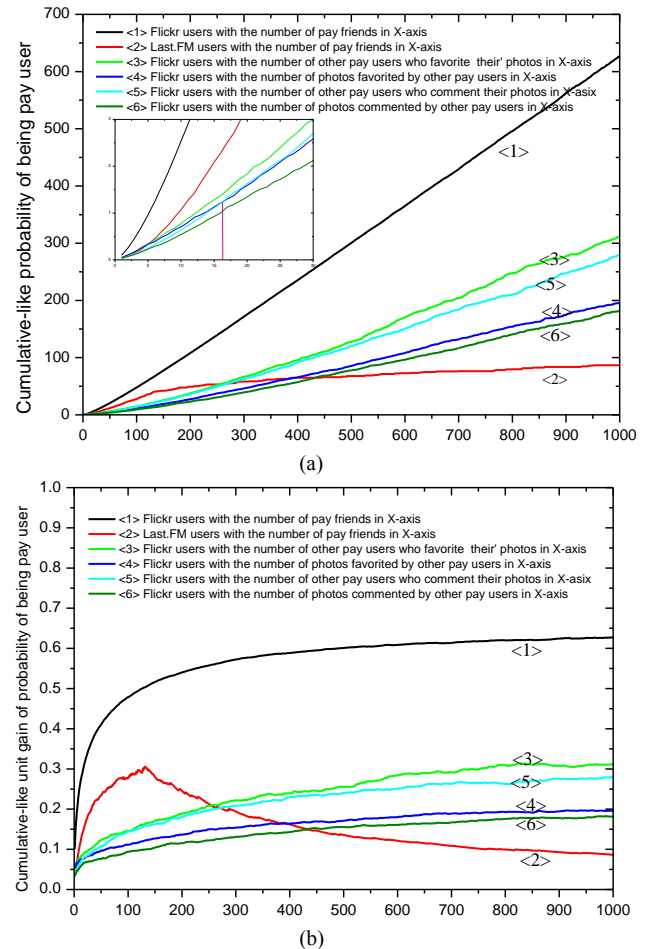


Figure 8. Comparison of cumulative-like (a) and cumulative-like unit gain (b) of probability of being pay user under different influences from pay users.

extent, we can say that social influence from pay users in photo-favorite interactions is higher than that from pay users in photo-comment interactions. This is reasonable because normally a user favorites a photo assuming that he positively likes the photo and bookmarks it for easy finding later, while a user commenting on a photo may give positive or negative feedback to the photo [13]. Note that, shown in the left-upper graph in Fig. 8 (a), around 16, the cumulative-like probability of being a pay user with the number of pay users who comment on one's photos overtakes that with the same number of photos favorited by pay users and from then on keeps the advantage.

We also want to know up to what extent that the increase in the number of pay users among friends, pay users that favorite and comment on one's photos, as well as the increase in the number of photos favorited and commented by pay users, will continue improving the effect of social influence from pay users. Fig. 8 (b) plots the cumulative-like unit gain of probability of being a pay user, brought by each additional pay user among one's friends, photo favorite or comment interactions, and by each additional photo favorited or commented by pay users. From the figure, we find that in Flickr, for users that have pay friends few than 200, increasing the number of pay friends will be fruitful for them to becoming pay users, and after more than 200 pay friends, the effect is less powerful and inconspicuous. For Last.FM, the value of number of pay friends is around 130, and after the bound, the cumulative-like unit gain even decreases. There are no clear bounds before and after what the cumulative-like unit gain of probability of being pay user rises continually and stops rising for the number of pay users who favorite or comment on one's photos and for the number of photos favorited or commented by pay users. However, we know that the bounds must be higher than 200, which is the bound for the number of pay friends for Flickr users.

Directly comparing the probability of being a pay user under different forms of percent range of pay users as discussed in previous sections, gives the similar result. We do not present the result here.

Comparing the results of different types of social influence from pay users, both Flickr and Last.FM will try to lead and attract free users to add more pay users as friends, and will increase the probability of becoming a pay user for these free users under the social influence from their pay friends. As for photo favorite and comment interaction in Flickr, users with a lot of pay users that favorite or comment on their photos are the latent target of business promotion for premium services.

#### IV. RELATED WORK

As the online social networks become more popular and users spend significantly more time online, how to make money from the online services is an issue of life and death [1, 2]. Currently, the majority of revenue for OSN giants such as Facebook and MySpace, still comes from online advertising [14]. Therefore, much effort has been paid on improving the target accuracy of OSN advertising [15, 16]. Except advertising, there are several

other sources of revenue in OSNs, including virtual goods, transaction fee, access charge and premium services [1, 3, 17]. We mainly consider OSNs based on the free plus premium business model (freemium).

In freemium-based OSNs, work in [1] show that the crucial driver for freemium-based OSNs is the creation of high levels of unique customer value, which directly determine users' willingness to pay for the premium services. The customer value originates mainly from rich user's profile and related user's activity and social interactions. Therefore, we study the effect of connecting and interacting with pay users in Flickr and Last.FM on the likelihood of a user being a pay user. We study the effect of connecting pay users in Flickr and Last.FM users' friend circle, and effect of interacting with pay users in Flickr photo favorite and comment interactions.

As for social influence in OSNs [9,10], users decide to adopt activities and behaviors based on the activities that are exhibited and adopted by those that have social interactions with [10]. For example, the probability of two users becoming friends increases as the number of their common friends increases [18], and the probability of joining a community in LiveJournal [10, 19], in Wikipedia [10] and DBLP [19] increases linearly as the number of a user's friends who are already in the community increases. Social influence in these previous works mainly refers to the influence from friends, as a kind of peer pressure in social networks [8, 20]. For example, in online social networks such as Orkut, YouTube, LiveJournal and Flickr, a set of friends is about 100 times more powerful in influencing a user to join a group than the same number of strangers [8], while in enterprise social media, recent manager and coworker activities have high impact on employees to initiate or resume participation [20]. In Douban, a typical Chinese web 2.0 community, 85% of the new readers for any particular book have at least one friend that already read that book [21]. Besides, work in [22] shows that it is likely to infer a user's interests from his/her social connections within several hops.

Compared with previous works in social influence in OSNs, we study how a pay user influences a user that he connects and interacts with to be a pay user in freemium-based OSNs. Particularly, we present how the probability of being a pay user is related to peer pressure, i.e., the number of pay users in one's friend circle, and further to the number of pay users one interacts with in the photo favorite and comment social interactions. We find that with the same number of pay users in connection of friends and in photo favorite and comment social interactions, the influence from pay users in friends circle is most powerful to affect a user to be a pay user.

From sociology, there exist a bound of works on how friends influence a person in daily life to adopt risky behaviors such as smoking and drinking [23], and to improve lifestyle like weight loss behaviors [24]. However, this is out of scope of our paper.

There exists few works on analyzing the behaviors of free users and pay users in freemium OSNs. Work in [25] studies the interplay between users' functional and social

behavior on Last.FM and models users' willingness to pay for premium services. It shows that the willingness to pay is strongly associated with the level of social activity of the users, especially the community activity. While work in [25] tend to understand user's behaviors in freemium OSN mainly from users' own profile and activities, we study the effect on the likelihood of a user being a pay user of connecting and interacting with pay users in Flickr and Last.FM that are friends, and pay users in Flickr that favorite photos and make comments.

## V. CONCLUSIONS AND FUTURE WORK

This paper investigates the social influence from pay users on a user to be a pay user in social networks using the free plus premium business (freemium) model. Based on large scale datasets crawled from Flickr and Last.FM, we present the empirical study and analysis of probability of being a pay user in three types of social influence from pay users, including pay users in Flickr and Last.FM users' friends, pay users in Flickr photo favorite interactions and pay users in Flickr photo comment interactions. Results show that the greater the number of pay users in the three types of influence, the more likely a user would be a pay user, but there exists a bound on the number of pay users on the three types of influence until there is no apparent benefit. Furthermore, pay users in one's friend circle are the most important and effective means of social influence to improve one's willingness to pay for premium features in social networks, followed by pay users in photo favorite activity and pay users in photo comment activity, under the same number of pay users, thus strengthening the point that friends exhibit a strong influence. The result can be used to help freemium-based OSNs to perfect the manner of social connections and interactions to attract more users to pay for the premium features and to find the accurate target users for the premium promotion.

Limitations exist in our work. There is no timestamp of adding friends and paying for premium services, thus we can not understand the temporal logical relationship between adding a certain number of pay friends (or having a certain number of pay users that favorite or comment on a free user's photos) and then becoming a pay user from a free user. This is left for future work. In addition, we leave the deep understanding and uncovering the reason for the sharp decreasing influence with percent of pay users over one's all friends, over all users that favorite or comment on one's photo higher than 0.95, as future work. Finally, similar work can be done on the influence of intentions to purchase e-commerce goods from people who already purchase the goods.

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