



Article

# One Good Turn Deserves Another: Antecedents of Online Karaoke Paid Gift-Sending from Social Exchange Perspectives

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**Abstract:** Understanding the dynamics of online karaoke virtual gift sending helps maximize its utility for all participants, including viewers, broadcasters, and platforms. However, extant paid gift-sending studies lack an integrated theoretical explanation of its incentives as well as practical implications that can facilitate the quantifiable implementation of service improvement. This study has successfully uncovered the motivation of paid gift-sending in an online karaoke context from a social exchange perspective using social exchange theory. By observing the activities of 11,640 online karaoke users over one year, it was discovered that their gift-sending behaviors adhere to the patterns of more-follower-more-gift-sending and receive-more-send-more. Moreover, such patterns are more pronounced for collaborative users and are accentuated over time. Theoretically, this study extends the scope of social commerce studies from B2C to C2C scenarios with more complicated interpersonal dynamics. Meanwhile, managers are advised to encourage following, stimulate collaboration, inject additional virtual gifts into the “market”, and retain their customers to generate long-term profits.

**Keywords:** paid gift-sending; social exchange theory; status seeking; reciprocity; digital marketing



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## 1. Introduction

Karaoke used to be highly dependent on venues. People booked private rooms in karaoke bars several days in advance, teamed up with friends at the agreed time, and belted out one after another. Nowadays, karaoke has become an omni-channel business thanks to internet technologies. Mobile apps such as Just Sing It, Karaoke Anywhere, and StarMaker have turned the internet into a virtual karaoke bar, allowing users to broadcast their voices and videos to friends and strangers. Online karaokes not only largely retain the functions of brick-and-mortar karaoke bars, but also provide additional features and fun such as video tuning, filtering, posting, and sharing. Therefore, a large segment of karaoke customers has shifted towards smart devices for online karaoke. Online karaoke has already become a huge industry. For example, Changba, an online karaoke platform, had accumulated 300 million users by the end of 2017 [1]. Moreover, the outbreak of COVID-19, prompting self-isolation on a global scale, has driven an even stronger growth of the online karaoke industry, with WeSing, another online karaoke platform, reporting 110 million monthly active users in July 2021 [2].

Unlike traditional karaoke bars that mainly profit from alcohol sales [3], online karaoke platforms generate revenue from paid gifts purchased by viewers and sent to broadcasters. Specifically, viewers use cash to purchase virtual gifts (via online payment) in the form of digital pictographs, such as a bunch of virtual flowers or a virtual yacht, and then send the gifts to their favorite broadcasters. The broadcasters, upon receiving the gifts, can redeem the gifts back into cash, but part of the revenue goes to the platform. This business model seems counterintuitive at first glance; viewers can free ride by not purchasing anything. However, in real practice, viewers actively purchase and send gifts, validating the business model as considerably profitable and creating a multi-win situation in which platforms and broadcasters earn cash, whereas viewers gain satisfaction. It is therefore meaningful to

fully understand the dynamics of virtual gift sending on online karaoke platforms so as to maximize its utility for all participants.

The antecedent of paid gift-sending is under-researched [4–7]. A limited number of studies have tried to explain the motivations of paid gift-sending or similar engagement consumption. These motivations include fulfilling personal needs for social interaction [4], expressing friendly feelings towards content providers in return for a sense of satisfaction [5], delivering appreciation such as gratification [6], or financially keeping the broadcasters on the platform [7]. Despite these preliminary findings, extant paid gift-sending studies have mostly been conducted in laboratory settings, which may deviate from the dynamics of real situations. An exception is Yu et al.'s [4] study of a live video streaming platform; however, it only included viewer engagement as a mere motivation of gift-giving, which could be further enhanced by incorporating more antecedents. Overall, existing paid gift-sending studies lack an integrated research framework that has been validated in a real situation, which can generate reliable practical implications to facilitate the quantifiable implementation of service improvement.

Based on such a research gap in paid gift-sending studies, this study aims to uncover the motivation of paid gift-sending in an online karaoke context from a social commerce perspective. Specifically, this study theorizes and quantifies paid gift-sending using social exchange theory. This study unfolds as follows: Section 2 provides a thorough retrospective of extant paid gift-sending and social exchange theory studies. Section 3 proposes the conceptual framework and develops the hypotheses regarding paid gift-sending based on social exchange theory. Section 4 describes the sample of this study as well as the empirical model. Section 5 reports the findings of this study followed by Section 6, which reciprocates with theoretical analysis and managerial implications. The final section revisits the key points of this study and provides future study suggestions.

The theoretical contribution of this study is embedded in the validation and extension of social exchange theory from pay-what-you-want (PWYW) studies to an online karaoke paid gift-sending scenario. Previous studies, albeit having successfully explored social exchange as an antecedent of PWYW, a concept close to paid gift-sending, are limited to pricing mechanisms and buyer–seller interactions that are significantly different from paid gift-sending. This study fills this research gap by establishing an integrated theoretical framework that incorporates users, followers, gift-receiving, gift sending, time, and collaboration. The theoretical framework and the findings offer meaningful supplementation to related extant studies and specifically adds an additional viewpoint to the diverse findings from previous literature that debate the time-dependence of paid gift-sending. Moreover, it extends the scope of social commerce studies from B2C to C2C scenarios in the karaoke industry with more complicated interpersonal dynamics.

The managerial contribution of this study manifests as reliable practical suggestions to online karaoke platforms in terms of service development and customer strategy inferred from real situations. Based on the empirical findings, this study provides managerial advice in order to enhance the user–follower structure, consolidate users' sense of belonging, strengthen both customer satisfaction and reciprocation motivation, and generate long-term profit.

The next section contains a review of related studies, addressing the need to examine paid gift-sending motivation from a social commerce perspective.

## 2. Related Work

### 2.1. Motivation of Paid Gift-Sending

When a viewer sends a gift to a broadcaster, the viewer does not financially benefit from the gift-sending. This somewhat resembles the situation of Twitter posting, in which a noncommercial user contributes content to the microblogging site without receiving money for their contributions. Toubia and Stephen [8] summarized the motivations for Twitter posting into two categories: image-related utility vs. intrinsic utility. According to these authors, image-related utility assumes that users are motivated by the perceptions of other

users, whereas intrinsic utility assumes that users receive direct utility from posting content, which leads to participating in an activity for the purposes of its inherent satisfactions. Such a self–other breakdown provides a valuable train of thought to analyze virtual gift consumption, online content contribution, or PWYW.

From image-related utility perspectives, Lynn's [9] choose-your-own-price study concluded that some people use price as an impression management tool to avoid appearing poor or cheap. Likewise, Huang [10] attributed virtual gift consumption behaviors to demonstrations of financial power. Taken broadly, Yu et al. [4] considered gift-giving in live video streaming as a status-seeking appeal, with gift givers enjoying a feeling of superior social status over other ordinary viewers. This partially agrees with Wasko and Faraj's [11] finding that people contribute knowledge because they perceive that it enhances their reputation and wins them approval, status, and respect. It is therefore unsurprising that some streaming platforms frequently circulate pop-up announcements to highlight "top donor of the day" to stimulate even greater donations [12]. To sum up, status-seeking, or similar socioemotional appeals plays a distinct role in motivating gift-sending.

From the intrinsic utility perspectives, in their PWYW study, Schons et al. [13] stated that customers are aware that paying zero or extremely low prices induces a loss for the seller, which makes it impossible to sustain the PWYW offer. Besides keeping the sellers in the market, customers are further driven by emotional connection [14,15], flow experience [16], socialization [17], social cooperation [13], fairness [7], reciprocal supportiveness [11], altruism [7], and satisfaction [4] during paid gift-sending or PWYW. Toubia and Stephen [8] considered intrinsic utility as a stronger motivation for noncommercial Twitter users when they have fewer followers, but this gives way to image-related utility after the number of followers increases. Accordingly, it makes good sense to consider reciprocity or similar intrinsic motivations when analyzing gift-sending, especially in the short term.

## 2.2. Paid-Gift Sending versus Pay-What-You-Want (PWYW)

Perhaps the closest conceptual neighbor of paid gift-sending is pay-what-you-want, or PWYW [18], or its equivalences, such as name-your-own price [19], which has been more profoundly studied in real situations. PWYW is a participative pricing mechanism in which consumers have maximum control over the price they pay for a product or a service [20]. Previous research has confirmed that most customers, albeit not all of them, do pay in PWYW situations [13]. In other words, free riding is uncommon in PWYW. Such economic irrationality [11], deviating from the neoclassical economic theory that consumers purely maximize their utility, has been tentatively explained by social exchange theory, which emphasizes satisfaction, reciprocity, and social status [13,21].

Unfortunately, paid gift-sending and PWYW differs in important ways such that the findings of PWYW studies may not directly apply to paid gift-sending studies. On the one hand, the pricing mechanisms are different. In PWYW situations, the prices of products (e.g., a souvenir photo) or services (e.g., a meal) to be paid for are relatively measurable; some studies explicitly compare PWYW to traditional posted-price sellers [7]. On the contrary, in return for paid gift-sending, what viewers obtain is much less tangible, making formulating an accurate price estimation challenging. Therefore, the question of paid gift-sending goes beyond the scope of pure economics as in the case of a PWYW situation and becomes somewhat more of a socioeconomics or socioemotional problem.

On the other hand, buyer–seller interactions differ even more. A typical PWYW transaction involves one buyer offering a price above or equal to zero to a seller for a given product or service. Buyers and sellers have their definite roles, and the transactions are unidirectional. For example, in Sharma et al.'s [18] PWYW study, tourists (buyers) purchased souvenir products from the souvenir shops (sellers), with the payment flowing from buyers to sellers unidirectionally. A more complex setup of PWYW can engage multiple buyers (who mutually exclusively compete for higher bidding) and/or multiple sellers (who mutually exclusively compete for lower offering) of the same product or

service; yet the buyer–seller relationship remains unidirectional. However, paid gift-sending is both non-exclusive and, in certain cases, bidirectional. For example, two viewers can simultaneously send gifts to the same broadcaster. A user can be both a viewer and a broadcaster, which implies that they send gifts on some occasions and receive gifts in others. Furthermore, gift-sending is not only observable to the broadcasters, but it is visible also to the other viewers in a real-time fashion. This once again indicates that paid gift-sending incorporates more social complexity that is not featured by PWYW. In short, paid gift-sending provides an insufficiently explored new laboratory where the knowledge discovered from PWYW studies can potentially be further validated and extended.

### 2.3. Paid Gift Sending in a Social Commerce Context

The above theoretical distance between paid gift-sending and PWYW suggests that it is necessary to analyze paid gift-sending in a social commerce context. This is because the strong social interaction between broadcasters and viewers is a key feature of social commerce, with the platform playing the role of social media, whereas PWYW does not take social factors into account. By definition, social commerce involves social media that supports social interaction and user contributions to assist in the online buying and selling of products and services. In a paid gift-sending scenario, viewers buy the performance of broadcasters with voluntary payment while interacting with other viewers who notice them because of the payment, academically termed as information sharing [22] motivated by social support [23], which enhances relationship quality and shared value [24].

However, existing social commerce studies have left several fields unexplored. First, existing studies have focused on B2C scenarios [25,26]. Paid gift-sending, a typical C2C scenario, deserves similar recognition. Secondly, existing studies emphasize the social support between buyers [23,27]. In paid gift-sending, there is also support from buyers to sellers, especially when considering the voluntary nature of payment. Finally, similar to PWYW, existing studies have been limited to the situations where buyers and sellers have their specific roles. For paid gift-sending, a user can be both a viewer and a broadcaster, creating a complicated but interesting dynamic system. Overall, additional work is needed to address paid gift-sending under a social commerce framework.

### 2.4. Social Exchange Theory

Social exchange theory explains human behavior in social exchanges other than economic exchanges [28]. Whereas economic exchanges tend to be quid pro quo and require active monitoring [29], social exchange tends to be open-ended, with the terms of exchange not being precisely specified [30]. Social exchange theory is among the most influential conceptual paradigms for understanding communication between internet users and consumption behaviors, including self-disclosure on microblogging sites [31], gifting through social network services [30], contributing to online professional communities [32], online purchasing intentions [33], online service quality [34], and online customer retention [35].

Cropanzano and Mitchell [36] summarized the rules of social exchange, with reciprocity playing a central role along with a few other rules of less importance, such as group gain, in which the benefits of exchange are put into a single common pot. Taking reciprocity and group gain together, social exchange theory has been extended beyond the dyadic perspective to generalized or indirect exchanges [37] such that, with gift-sending being an example, A may send a gift to B, B may send a gift to C, and, in turn, C may send a gift to A. This resembles the situation of paid gift-sending on online karaoke platforms, where users can freely send gifts within a broad network without necessarily following any unidirectional or quid pro quo routine. Meanwhile, the long-term nature of social exchange [38] provides the possibility of understanding the lifecycle of online karaoke users from a social exchange viewpoint. Moreover, social exchange can generate a spectrum of socioemotional outcomes including love, trust, reputation, and status [33,36]. These intangible outcomes parallel the aforementioned image-related utility and intrinsic utility.

Therefore, the constitution of a unified theoretical framework under social exchange theory is expected to analyze the antecedents of paid gift-sending.

### 2.5. Heterogeneity in Paid Gift-Sending

Paid gift-sending or PWYW has been proved to fluctuate with user engagement, manifesting as either the user lifecycle or the user network. From viewpoint of the user lifecycle, Schons et al. [13] has suggested that the prices that people pay would decline over time in PWYW. However, Kim et al. [20] provided contrasting evidence that customers repeatedly purchasing from a store develop loyalty and subsequently increase the price that they are willing to pay over time. In addition, Gros et al. [17] revealed that heavy users who spend more hours per week on streaming platforms are more likely to donate. These diverse findings leave the time-dependence of paid gift-sending an open question.

As for user networks, Oestreicher-Singer and Zalmanson [39] found that the active users of an online community are more likely to join a paid subscription than users who consume content only. According to these authors, the active users climbing the so-called “ladder of participation” or deepening engagement is different from the sheer amassing of content consumption, with the latter being a more time-dependent factor. Similarly, Kilger and Romer [40] showed that the social networking feature of engagement on the internet is positively correlated with the likelihood of product purchase. Wasko and Faraj [11] regarded these socially engaged users as structurally embedded in the network, where the individuals are in regular contact with one another and are more likely to understand and comply with the group norms and expectations of online content contribution. Therefore, when analyzing a user, it is equally important to analyze the network surrounding them.

## 3. Conceptual Model and Hypotheses Development

### 3.1. Conceptual Model

The idea behind the conceptual model of paid gift-sending motivation is first capturing the social-economic incentives before gift-sending and then interpreting them using social exchange theory. This constitutes the main effects of the conceptual model, as depicted in Figure 1. Meanwhile, the heterogeneity of the user lifecycle or the user network could play the role of moderating effects. Sections 3.2 and 3.3 elaborate on the specific hypotheses.

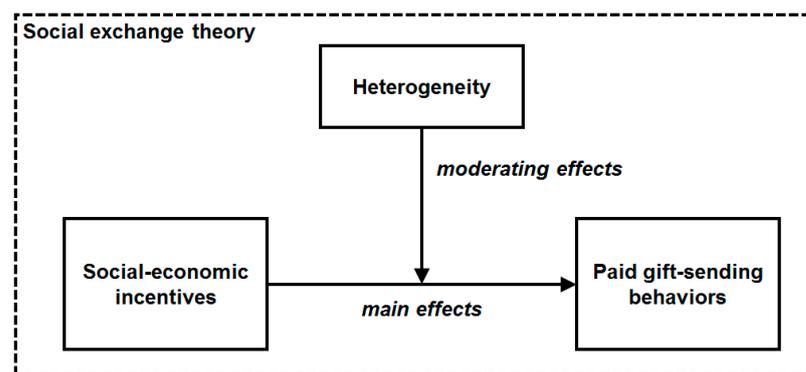


Figure 1. Conceptual model.

### 3.2. Hypotheses Development: Main Effects

Social exchange theory suggests that people sometimes exchange economic capital for social capital [36]. An online karaoke platform provides exactly such a medium where a user gives up an economically paid gift for socioemotional gains, including the demonstration of financial power and the feeling of superior social status over other users. This is because gift-sending is visible not only to the broadcaster who receives the gift but also to other peer users. Among these peer users are a special subset of users termed “followers”. A user becomes a follower of another user by “following” the latter on the karaoke platform, such that the latter’s actions (e.g., gift-sending, video posting), albeit observable to

anyone on the platform, are more noticeable to her followers in a real time fashion. Such a core-periphery structure [41] brings popularity and reputation to the users at the core [42], and these users can exert impact on their followers, such as driving the daily activity rhythms of the latter [43]. Meanwhile, to keep themselves in such high status, the users are expected to more actively leverage paid gift-sending as an impression management tool to further enhance their reputations, continuously winning themselves approval, status, and respect. It is therefore predicted that a stronger increase in the number of users that follow a broadcaster can trigger the user to have a stronger status-seeking appeal, manifested as, with Yu et al. [4], addressing the necessity of differentiating the following two indicators: the elevated frequency of sending gifts to broadcasters and the increased running total value of the gifts sent to broadcasters.

**Hypothesis 1a (H1a).** *The number of a user's new followers has a positive effect on the frequency at which she sends gifts to broadcasters.*

**Hypothesis 1b (H1b).** *The number of a user's new followers has a positive effect on the running total value of the gifts she sends to broadcasters.*

Users not only attract followers but also receive paid gifts, either from followers or from other users. Social exchange theory suggests that the users, upon receiving the gifts, tend to reciprocate. One way to reciprocate is directly giving back. For example, Reyes [44] reported the direct reciprocation of a birthday greeting on a social network website. Another way to reciprocate is more indirect, such as receiving online health support from one user but offering support to another user [45] or seeking online review opinions from some users but giving opinions to other users [46]. According to social exchange theory, indirect reciprocation creates group gain by putting the benefits of exchange into a common pot. This is expected to apply to online karaoke platforms where users interact in a community of shared interests. Specifically, on some occasions, when two users are mutually viewers and broadcasters, they may directly send paid gifts to each other upon watching each other's videos. On other occasions, when the gift sender only views others' videos but does not broadcast her own, the user may not directly receive a gift back but can still benefit from group gain, including the sense of being connected, social cooperation, and collective satisfaction, triggered by the gift receiver passing the gift on to a third user. Taking direct and indirect reciprocation together, the following hypotheses are proposed:

**Hypothesis 2a (H2a).** *The frequency at which a user receives gifts from viewers has a positive effect on the frequency at which she sends gifts to broadcasters.*

**Hypothesis 2b (H2b).** *The running total value of the gifts a user receives from viewers has a positive effect on the running total value of the gifts she sends to broadcasters.*

### 3.3. Hypotheses Development: Moderating Effects

The long-term nature of social exchange suggests that time is a potentially important factor that can moderate social exchange. The two major categories of motivations for social exchange on online karaoke platforms, namely image-related utility and intrinsic utility, may unfold in different forms over time. On the one hand is paid gift-sending for the purposes of maintaining status, an image-related utility, driven by the growth of the number of a user's new followers. The growth of the number of user-follower relationships is expected to generate diminishing motivation over time because users who have used the online karaoke platform for a certain period of time have already partially satisfied their need for approval, status, and respect, such that they are less excited when forming additional relationships [47]. Therefore, it is proposed that the effect of the increase in the number of a user's followers on the user's paid gift-sending behavior diminishes over time.

**Hypothesis 3a (H3a).** *The impact of the number of a user's new followers on the frequency at which she sends gifts to broadcasters is less pronounced one year after her registration compared to right after registration.*

**Hypothesis 3b (H3b).** *The impact of the number of a user's new followers on the running total value of the gifts she sends to broadcasters is less pronounced one year after her registration compared to right after registration.*

On the other hand is paid gift-sending out of reciprocity, an intrinsic utility, driven by receiving gifts from viewers. Unlike satisfaction from approval, status, or respect, which can reach saturation over time [48], the pursuit of the sense of being connected, fairness, and reciprocal supportiveness hardly weakens. Such a pursuit is even reinforced over time because individuals that have experienced this reciprocation with others over a long period time will cognitively develop the reciprocal norm [11], which, in turn, consolidates gift-sending practices. Hence, it is hypothesized that the effect of the increase in receiving gifts from viewers on user gift-sending behavior is accentuated over time.

**Hypothesis 4a (H4a).** *The impact of the frequency at which a user receives gifts from viewers on the frequency at which she sends gifts to broadcasters is more pronounced one year after her registration compared to right after registration.*

**Hypothesis 4b (H4b).** *The impact of the running total value of the gifts a user receives from viewers on the running total value of the gifts she sends to broadcasters is more pronounced one year after her registration compared to right after registration.*

As has been stated above, time, or user lifecycle, is only one dimension of user engagement. User network, the other dimension, is believed to play an equally important role by acting as a catalyst of social exchange. For example, online network ties have been proven to encourage content contribution [48]. These and other internet users embed themselves into online networks by continually browsing content, contributing content, and participating in other online activities [49,50]. As a consequence, they develop the sense of belonging and bonding [51,52]. Online karaoke platforms are no exception but allow a unique form of networking: collaboration. Specifically, two or more users are said to collaborate on a song if each of them sings a different part of the song. For example, two users can collaborate in *Levitating*, with one singing Dua Lipa's part and the other singing DaBaby's part. Such collaboration deepens the users' engagement in the activities on the platforms and strengthens the bonding forces within the network and is thus expected to accelerate the dynamics of paid gift-sending.

**Hypothesis 5a (H5a).** *The impact of the number of a user's new followers on the frequency at which she sends gifts to broadcasters is more pronounced for collaborative users than for standalone users.*

**Hypothesis 5b (H5b).** *The impact of the frequency at which a user receives gifts from viewers on the frequency at which she sends gifts to broadcasters is more pronounced for collaborative users than for standalone users.*

**Hypothesis 6a (H6a).** *The impact of the number of a user's new followers on the running total value of the gifts she sends to broadcasters is more pronounced for collaborative users than for standalone users.*

**Hypothesis 6b (H6b).** *The impact of the running total value of the gifts a user receives from viewers on the running total value of the gifts she sends to broadcasters is more pronounced for collaborative users than for standalone users.*

All the above hypotheses are summarized in Figure 2.

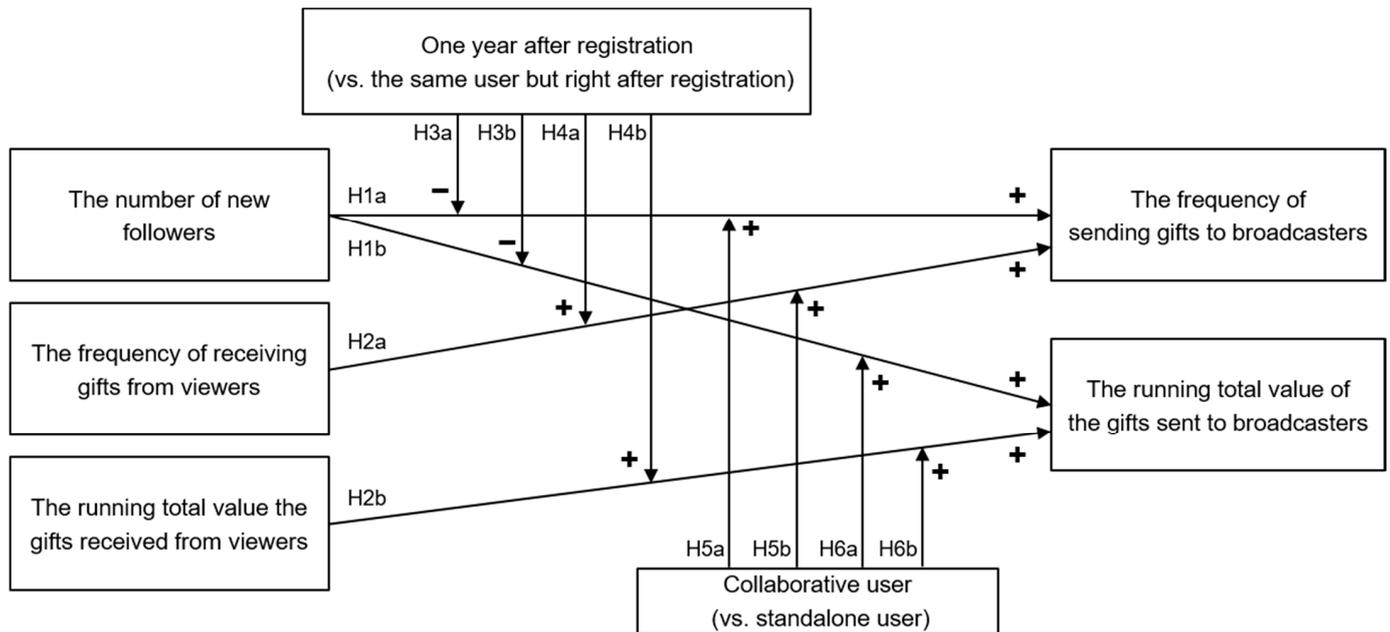


Figure 2. A summary of the hypotheses.

#### 4. Data and Method

To explore user paid gift-sending behavior, this study obtained user data from one of the largest online karaoke service providers in the world. The karaoke provider has agreed to provide the user data archived on its server for research purposes upon anonymization. Ethically, this study was cautiously conducted and reported to protect the rights of the karaoke provider and its users. The name of the karaoke provider is not disclosed per the provider’s request. Meanwhile, the IDs of the studied users were masked because this study aims to discover knowledge from the sampled users as a collective ensemble rather than probing individual behaviors.

This mobile karaoke app had nearly 4 million monthly app downloads in June 2020 alone. After a user registers on the platform by creating a personal account, they can engage in all kinds of activities, including recording songs, collaborating on songs with other users, posting audios and videos, being followed by other users, receiving paid gift from viewers, viewing the audio and videos of others, sending paid gifts to broadcasters, purchasing additional gifts with cash, and redeeming surplus gifts back into cash. Some 12,000 users who had registered on the platform on 1 December 2018 were studied. These users were randomly selected from all of the users worldwide who registered on that same day. Among these 12,000 users are 360 users who did not engage in any activity on the app within one year after registration and were thus eliminated. For the remaining 11,640 users, their activity data during the period from 1 December 2018 to 30 November 2019 was obtained as the variables of this study. See Table 1 for a detailed description of the data and the variables. The average age of these users was around 20 years old, with slightly more male users (37%) than female users (35%) (other 28% did not disclose). As for nationality, Indian (33%), Indonesian (18%), and American (U.S.) (12%) users took up more than 60% of the sample. It is noted that the sample year was divided into 53 weeks to address intertemporal relevance, with some variables defined as the subtotal of a week. A finer division of time (into days, for example) may introduce data noise owing to different user habits of use between weekdays and weekends. A coarser division of time (say into months) may obscure intertemporal relevance because the time span is too large.

**Table 1.** Data and variables.

User Activity Data/Other Data	Variable in Hypotheses/Control Variable	Variable Name	Variable Value
1. Paid gift-sending	The frequency at which a user sends gifts to broadcasters in a week	SendFreq <sub>iw</sub>	
	The total value of the gifts a user sends to broadcasters in a week (i.e., running total)	SendValue <sub>iw</sub>	Denominated by USD
2. Being followed by other users	The number of a user’s new followers in a week (i.e., running total)	NewFollow <sub>iw</sub>	
3. Paid gift-receiving	The frequency at which a user receives gifts from viewers in a week	ReceiveFreq <sub>iw</sub>	
	The total value of the gifts a user receives from viewers in a week (i.e., running total)	ReceiveValue <sub>iw</sub>	Denominated by USD
4. Registration	One year after a user’s registration compared to the same user right after registration	Register <sub>i</sub>	0: if gift-sending happened right after registration (Week 1-12#) 1: if gift-sending happened one year after registration (Week 42-53#) In other words, Register <sub>i</sub> is a time stamp that allows the intertemporal comparison of user behavior. Note that all of the studied users registered in Week 1#.
5. Collaboration	The cumulative total number of collaborations a user completed after a week	TotalCollab <sub>iw</sub>	
6. User activity in other forms	The cumulative total number of “likes” a user had received from other users after a week	TotalLikeReceive <sub>iw</sub>	
	The number of users whom a user begins to follow in a week (i.e., running total)	FollowOther <sub>iw</sub>	
	The cumulative total number of a user’s followers after a week	TotalFollow <sub>iw</sub>	
	The number of users whom a user has followed after a week	TotalFollowOther <sub>iw</sub>	
7. Demographic factors	A user’s highest level on the platform in a week	Level <sub>iw</sub>	1 ≤ Level <sub>iw</sub> ≤ 64
	Age	Age <sub>i</sub>	11 ≤ Age <sub>i</sub> ≤ 90
	Location	Location <sub>i</sub>	
8. Time effects	Month	Month <sub>w</sub>	
	Week	Week <sub>w</sub>	1, 2, 3, 4, 5

Note: meanings of the subscripts. -i: the ith user, altogether 11,640 users. -w: the wth week, altogether 53 weeks.

Apart from collecting user activity data that corresponds to the variables in the hypotheses (the upper half of Table 1), this study obtained additional data as control variables to avoid bias resulting from user activity in other forms, demographic factors, and time effects (the lower half of Table 1). All of these variables were incorporated into the following fixed-effects models [53–55].

$$\begin{aligned}
 \text{Ln}(\text{SendFreq}_{iw}) = & \beta_0 + \beta_1 * \text{Ln}(\text{NewFollow}_{iw-1}) + \beta_2 * \text{Ln}(\text{ReceiveFreq}_{iw-1}) \\
 & + \beta_3 * \text{Ln}(\text{NewFollow}_{iw-1}) * \text{Ln}(\text{TotalCollab}_{iw}) \\
 & + \beta_4 * \text{Ln}(\text{ReceiveFreq}_{iw-1}) * \text{Ln}(\text{TotalCollab}_{iw}) \\
 & + \text{Control} + \varepsilon_{iw}
 \end{aligned}
 \tag{1}$$

$$\begin{aligned}
 \text{Ln}(\text{SendValue}_{i\text{w}}) = & \gamma_0 + \gamma_1 * \text{Ln}(\text{NewFollow}_{i\text{w}-1}) + \gamma_2 * \text{Ln}(\text{ReceiveValue}_{i\text{w}-1}) \\
 & + \gamma_3 * \text{Ln}(\text{NewFollow}_{i\text{w}-1}) * \text{Ln}(\text{TotalCollab}_{i\text{w}}) \\
 & + \gamma_4 * \text{Ln}(\text{ReceiveValue}_{i\text{w}-1}) * \text{Ln}(\text{TotalCollab}_{i\text{w}}) \\
 & + \text{Control} + \varepsilon_{i\text{w}}
 \end{aligned}
 \tag{2}$$

where  $\beta_i$  and  $\gamma_i$  denote the coefficients to be estimated. Meanwhile, the moderating effects of  $\text{Register}_i$  will be tested by grouped regression [56].

### 5. Results

#### 5.1. Descriptive Statistics

Stata<sup>®</sup> 16 was employed to analyze the data in this study. The descriptive statistics are summarized in Table 2. From the total 616,920 observations, it can be observed that the average user sends 0.3 gifts and receives 0.2 gifts every week. In terms of gift value, the average user sends \$6 worth of gifts and receives \$3.5 worth of gifts per week. The cumulative gap between sending more and receiving less is filled by the net purchasing of gifts, which partially agrees with the business model of online karaoke. The fact that this study had randomly sampled a group of net purchasing (instead of net redeeming or balanced) users also suggests that the majority of the users on the platform are conducting net purchasing, whereas only a tiny fraction of the users are net redeeming. Overall, the studied sample is believed to represent the majority of the users who contribute to revenue. The correlation matrix of the variables is displayed in Table 3.

Table 2. Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
<b>DV</b>				
SendFreq <sub>iw</sub>	0.313	19.46	0	3965
SendValue <sub>iw</sub>	6.003	676.6	0	364,871
<b>IV</b>				
NewFollow <sub>iw</sub>	2.282	76.19	0	33,053
ReceiveFreq <sub>iw</sub>	0.204	4.540	0	665
ReceiveValue <sub>iw</sub>	3.536	251.4	0	113,134
TotalCollab <sub>iw</sub>	0.130	0.016	0	226
<b>Control</b>				
TotalLikeReceive <sub>iw</sub> *	0.731	0.427	0	2390
FollowOther <sub>iw-1</sub>	0.748	7.821	0	995
TotalFollow <sub>iw</sub> *	109.2	1527	0	87,839
TotalFollowOther <sub>iw</sub> *	23.11	98.25	0	2301
Level <sub>iw</sub> *	7.285	8.056	1	64
Age <sub>i</sub>	19.69	24.19	11	90
N	616,920			

\* Statistics reported on week 53#.

Table 3. Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12
1 SendFreq <sub>iw</sub>	1.000											
2 SendValue <sub>iw</sub>	0.968 *	1.000										
3 NewFollow <sub>iw-1</sub>	0.253 *	0.249 *	1.000									
4 ReceiveFreq <sub>iw-1</sub>	0.557 *	0.539 *	0.441 *	1.000								
5 ReceiveValue <sub>iw-1</sub>	0.563 *	0.561 *	0.432 *	0.966 *	1.000							
6 TotalCollab <sub>iw</sub>	0.100 *	0.093 *	0.486 *	0.226 *	0.211 *	1.000						
7 TotalLikeReceive <sub>iw</sub>	0.124 *	0.118 *	0.376 *	0.259 *	0.245 *	0.259 *	1.000					
8 FollowOther <sub>iw</sub>	0.144 *	0.138 *	0.556 *	0.280 *	0.270 *	0.248 *	0.120 *	1.000				
9 TotalFollow <sub>iw</sub>	0.122 *	0.120 *	0.260 *	0.197 *	0.194 *	0.156 *	0.086 *	0.210 *	1.000			
10 TotalFollowOther <sub>iw</sub>	0.136 *	0.137 *	0.327 *	0.211 *	0.212 *	0.158 *	0.138 *	0.097 *	0.700 *	1.000		
11 Level <sub>iw</sub> *	0.064 *	0.065 *	0.135 *	0.099 *	0.100 *	0.064 *	0.052 *	-0.003 *	0.517 *	0.684 *	1.000	
12 Age <sub>i</sub>	0.007 *	0.004 *	0.038 *	0.012 *	0.011 *	0.020 *	0.013 *	0.023 *	0.083 *	0.062 *	0.034 *	1.000

\*  $p < 0.05$ .

5.2. Main and Moderating Effects

Regression results for the frequency at which users send gifts to broadcasters, summarized in Table 4, suggest that both the number of new followers and the frequency of receiving gifts from viewers have positive effects on the frequency at which users send gifts to broadcasters. To be specific, according to column (5), every 1% increment in the number of new followers can trigger a 0.036% of increment in the frequency of gift sending. Every 1% increment in gift receiving frequency can produce a 0.108% increment in the frequency of gift sending. Therefore, H1a and H2a are supported, validating the exchange of economic capital for social capital as well as direct/indirect reciprocity. Meanwhile, the two cross terms in Table 4 both have positive coefficients, indicating that the above two effects are more pronounced for collaborative users than they are for standalone users. Hence, H5a and H5b are supported, demonstrating the role of the user network as the catalyst of social exchange that accelerates the dynamics of paid gift-sending.

**Table 4.** Regression results for the frequency at which users send gifts to broadcasters.

	DV: Ln(SendFreq <sub>iw</sub> )				
	(1)	(2)	(3)	(4)	(5)
<b>IV</b>					
Ln(NewFollow <sub>iw-1</sub> )	0.006 ** (0.002)	0.027 *** (0.004)	0.028 *** (0.001)	0.026 *** (0.001)	0.036 *** (0.001)
Ln(ReceiveFreq <sub>iw-1</sub> )	0.427 *** (0.010)	0.157 *** (0.031)	0.282 *** (0.001)	0.113 *** (0.003)	0.108 *** (0.003)
Ln(NewFollow <sub>iw-1</sub> ) * Ln(TotalCollab <sub>iw</sub> )					0.050 *** (0.002)
Ln(ReceiveFreq <sub>iw-1</sub> ) * Ln(TotalCollab <sub>iw</sub> )					0.013 *** (0.001)
<b>Control</b>					
TotalLikeReceive <sub>iw</sub>		-0.045 *** (0.012)		0.058 *** (0.003)	0.048 *** (0.003)
FollowOther <sub>iw</sub>		0.002 *** (0.000)		0.010 *** (0.000)	0.010 *** (0.000)
TotalFollow <sub>iw</sub>		-0.010 *** (0.002)		-0.001 * (0.001)	0.000 (0.001)
TotalFollowOther <sub>iw</sub>		0.001 *** (0.000)		0.008 *** (0.000)	0.008 *** (0.000)
Ln(TotalCollab <sub>iw</sub> )		-0.043 *** (0.008)		-0.029 *** (0.002)	-0.205 *** (0.006)
Individual Fixed Effect	No	No	Yes	Yes	Yes
Time Fixed Effect	No	No	Yes	Yes	Yes
N	616,920	616,920	616,920	616,920	616,920
Adjusted R <sup>2</sup>	0.31	0.32			
Within group R <sup>2</sup>			0.11	0.12	0.12

Note: Standard errors in parentheses, \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Regression results on the running total values of the gifts that users send to broadcasters, reported in Table 5, show that both the number of new followers and the running total value of the gifts received from viewers have positive effects on the running total value of the gifts sent to broadcasters. Quantitatively, according to column (5), every 1% increment in the number of new followers can result in a 0.068% of increment in the running total value of the gifts that are sent. Every 1% increment in the running total value of gift receiving can generate a 0.250% increment in the running total value of the gifts that are sent. Consequently, H1b and H2b are supported, which is a further validation of the exchange of economic capital for social capital as well as for direct/indirect reciprocity. In addition, the two cross terms in Table 5 both have positive coefficients, meaning the above two effects are more pronounced for collaborative users than they are standalone users.

Accordingly, H6a and H6b are supported, which enhances the role of the user network as the accelerating mechanism for paid gift-sending.

**Table 5.** Regression results for the running total value of the gifts sent to broadcasters from users.

	DV: Ln(SendValue <sub>iw</sub> )				
	(1)	(2)	(3)	(4)	(5)
<b>IV</b>					
Ln(NewFollow <sub>iw-1</sub> )	0.008 ** (0.003)	0.043 *** (0.006)	0.040 *** (0.001)	0.040 *** (0.002)	0.068 *** (0.002)
Ln(ReceiveValue <sub>iw-1</sub> )	0.409 *** (0.010)	0.411 *** (0.010)	0.275 *** (0.001)	0.273 *** (0.001)	0.250 *** (0.001)
Ln(NewFollow <sub>iw-1</sub> ) * Ln(TotalCollab <sub>iw</sub> )					0.042 *** (0.003)
Ln(ReceiveValue <sub>iw-1</sub> ) * Ln(TotalCollab <sub>iw</sub> )					0.350 *** (0.001)
<b>Control</b>					
TotalLikeReceive <sub>iw</sub>		-0.073 *** (0.016)		0.077 *** (0.004)	-0.085 *** (0.004)
FollowOther <sub>iw</sub>		0.003 *** (0.000)		0.017 *** (0.001)	0.014 *** (0.001)
TotalFollow <sub>iw</sub>		-0.016 *** (0.002)		-0.003 ** (0.001)	0.000 (0.001)
TotalFollowOther <sub>iw</sub>		0.001 (0.000)		0.013 *** (0.001)	0.011 *** (0.001)
Ln(TotalCollab <sub>iw</sub> )		-0.070 *** (0.012)		-0.043 *** (0.003)	-0.357 *** (0.009)
Individual Fixed Effect	No	No	Yes	Yes	Yes
Time Fixed Effect	No	No	Yes	Yes	Yes
N	616,920	616,920	616,920	616,920	616,920
Adjusted R <sup>2</sup>	0.32	0.32			
Within Group R <sup>2</sup>			0.11	0.11	0.19

Note: Standard errors in parentheses, \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Regression results comparing one year after registration ( $Register_i = 1$ ) with right after registration ( $Register_i = 0$ ), summarized in Table 6, suggest that the impact of the number of a user’s new followers on both the frequency at which she sends gifts to other broadcasters and the running total value of the gifts she sends to broadcasters is more pronounced one year after registration compared to right after registration. Note that empirical  $p$ -value is calculated to facilitate cross-group comparison [56]. This contradicts the predictions of H3a and H3b. Therefore, H3a and H3b are not supported. Meanwhile, Table 6 also shows that the impact of the frequency at which a user receives gifts from viewers (/the running total value of the gifts she receives from viewers) on the frequency at which she sends gifts to broadcasters (/running total value of the gifts she sends to broadcasters) is more pronounced one year after registration compared to right after registration. Hence, H4a and H4b are supported. In other words, both the exchange of economic capital for social capital and the direct/indirect reciprocity strengthen over time.

**Table 6.** Regression results comparing one year after registration to right after registration.

	DV: Ln(SendFreq <sub>iw</sub> )			DV: Ln(SendValue <sub>iw</sub> )		
	(1) Register <sub>i</sub> = 0	(2) Register <sub>i</sub> = 1	Empirical $p$ -Value	(3) Register <sub>i</sub> = 0	(4) Register <sub>i</sub> = 1	Empirical $p$ -Value
<b>IV</b>						
Ln(NewFollow <sub>iw-1</sub> )	0.016 *** (0.001)	0.125 *** (0.004)	0.000	0.028 *** (0.002)	0.267 *** (0.006)	0.000
Ln(ReceiveFreq <sub>iw-1</sub> )	0.124 *** (0.002)	0.268 *** (0.003)	0.000			

Table 6. Cont.

	DV: Ln(SendFreq <sub>iw</sub> )			DV: Ln(SendValue <sub>iw</sub> )		
	(1) Register <sub>i</sub> = 0	(2) Register <sub>i</sub> = 1	Empirical <i>p</i> -Value	(3) Register <sub>i</sub> = 0	(4) Register <sub>i</sub> = 1	Empirical <i>p</i> -Value
Ln(ReceiveValue <sub>iw-1</sub> )				0.106 *** (0.002)	0.226 *** (0.003)	0.000
Ln(NewFollow <sub>iw-1</sub> )	0.031 *** (0.003)	0.048 *** (0.005)		-0.043 *** (0.005)	-0.068 *** (0.006)	
* Ln(TotalCollab <sub>iw</sub> )						
Ln(ReceiveFreq <sub>iw-1</sub> )	0.000 (0.002)	0.005 (0.003)				
* Ln(TotalCollab <sub>iw</sub> )						
Ln(ReceiveValue <sub>iw-1</sub> )				0.383 *** (0.003)	0.239 *** (0.003)	
* Ln(TotalCollab <sub>iw</sub> )						
<b>Control</b>						
TotalLikeReceive <sub>iw</sub>	0.055 *** (0.008)	0.041 *** (0.007)		-0.094 *** (0.012)	-0.124 *** (0.010)	
FollowOther <sub>iw</sub>	-0.000 (0.001)	-0.017 *** (0.004)		-0.001 (0.001)	-0.053 *** (0.006)	
TotalFollow <sub>iw</sub>	0.003 *** (0.001)	0.002 (0.002)		0.004 *** (0.001)	-0.002 (0.003)	
TotalFollowOther <sub>iw</sub>	0.005 *** (0.001)	-0.027 *** (0.004)		0.005 *** (0.001)	-0.046 *** (0.005)	
Ln(TotalCollab <sub>iw</sub> )	-0.110 *** (0.010)	-0.193 *** (0.015)		0.023 (0.014)	-0.548 *** (0.022)	
Individual Fixed Effect	Yes	Yes		Yes	Yes	
Time Fixed Effect	Yes	Yes		Yes	Yes	
N	139,680	139,680		139,680	139,680	
Within group R <sup>2</sup>	0.03	0.01		0.07	0.07	

Note: Standard errors in parentheses, \*\*\* *p* < 0.001.

In summary, with the exception of H3a and H3b, all of the other hypotheses are supported, see Table 7.

Table 7. Summary of hypotheses testing.

No.	Hypothesis	Result
H1a	The number of a user’s new followers has a positive effect on the frequency at which she sends gifts to broadcasters.	Accepted
H1b	The number of a user’s new followers has a positive effect on the running total value of gifts she sends to broadcasters.	Accepted
H2a	The frequency at which a user receives gifts from viewers has a positive effect on the frequency at which she sends gifts to broadcasters.	Accepted
H2b	The running total value of the gifts a user receives from viewers has a positive effect on the running total value of the gifts she sends to broadcasters.	Accepted
H3a	The impact of the number of a user’s new followers on the frequency at which she sends gifts to broadcasters is less pronounced one year after her registration compared to right after registration.	Rejected
H3b	The impact of the number of a user’s new followers on the running total value of the gifts she sends to broadcasters is less pronounced one year after her registration compared to right after registration.	Rejected
H4a	The impact of the frequency at which a user receives gifts from viewers on the frequency at which she sends gifts to broadcasters is more pronounced one year after her registration compared to right after registration.	Accepted
H4b	The impact of the running total value of the gifts a user receives from viewers on the running total value of the gifts she sends to broadcasters is more pronounced one year after her registration compared to right after registration.	Accepted
H5a	The impact of the number of a user’s new followers on the frequency at which she sends gifts to broadcasters is more pronounced for collaborative users than for standalone users.	Accepted
H5b	The impact of the frequency at which a user receives gifts from viewers on the frequency at which she sends gifts to broadcasters is more pronounced for collaborative users than for standalone users.	Accepted
H6a	The impact of the number of a user’s new followers on the running total value of the gifts she sends to broadcasters is more pronounced for collaborative users than for standalone users.	Accepted
H6b	The impact of the running total value of the gifts she receives from viewers on the running total value of the gifts she sends to broadcasters is more pronounced for collaborative users than for standalone users.	Accepted

## 6. Discussion

Because the majority of the hypotheses, which are derived from social exchange theory, are quantitatively supported, this study has successfully theorized paid gift-sending based on social exchange theory. More specifically, the positive effect of the number of a user's new followers on the frequency at which she sends gifts to broadcasters and the running total value of the gifts she sends to broadcasters confirms that users do exchange economic capital for social capital on online karaoke platforms. Such paid gift-sending is believed to be an impression management tool to enhance their reputations and continuously win them approval, status, and respect in the core-periphery/user-follower structure. Bratu's [57] social media influencer study attributed a similar phenomenon as the need for social presence. In previous studies [11,13,21,33,35], status-seeking has been adequately discussed but has been insufficiently quantified. This study has successfully operationalized status-seeking using the number of a user's followers as a proxy, which provides a meaningful reference for future studies. Managerially, online karaoke platforms are therefore suggested to further exploit the "follow" function by either monetarily encouraging following or by developing similar functions to continually enhance the core-periphery structure.

It is also verified that users reciprocate following a receive-more-send-more pattern in terms of both frequency and running total value. It is worth noting that this study is by far the first gift-sending study to quantitatively measure reciprocation. Such reciprocation, direct or indirect, creates group gain by putting the benefits of exchange into a common pot where the users interact in a community of shared interests and perceived emotional values [58]. This interaction helps reinforce the sense of being connected, social cooperation, and collective satisfaction. Managers can thus inject additional virtual gifts into the "market", such as holding a lottery, so as to strengthen both customer satisfaction and reciprocation motivation.

In addition, collaborative users have been proven to more strictly abide by the rules of more-follower-more-gift-sending and receive-more-send-more. Compared to standalone users, collaborative users more deeply embed themselves into the online karaoke network by interactively creating content with other users. Such collaboration deepens these users' engagement in the activities on these platforms and strengthens the bonding forces within the network, thus accelerating the dynamics of paid gift-sending. Compared to Yu et al.'s [4] study that discovered the positive effect of the quantity of viewer engagement on gift-giving, this study further addresses that the quality of user engagement can also positively affect paid gift-sending. Managers are therefore advised to stimulate collaboration or to initiate other interactive activities to consolidate users' sense of belonging and bonding to the platform as well as to the user network.

Last but not least, time is confirmed as an important factor that moderates social exchange due to its long-term nature. It is surprising that both of the two major categories of motivation for social exchange on online karaoke platforms, namely image-related utility and intrinsic utility, are accentuated over time. To be specific, both more-follower-more-gift-sending and receive-more-send-more are more pronounced one year after a user's registration compared to the same user but right after registration. From the image-related utility perspective, users who have used the online karaoke platform for a certain period of time are constantly seeking incremental approval, status, and respect without reaching a status of mental satiation. From the intrinsic utility perspective, users are also continually pursuing the sense of being connected, fairness, reciprocal supportiveness, and such a pursuit is even reinforced over time because individuals who have experienced reciprocation with others for a long time will cognitively develop the reciprocal norm, which, in turn, consolidates the gift-sending practice. Theoretically, this finding provides an additional voice to the diverse findings from previous literature [11,13,20,47] that debate the time-dependence of paid gift-sending and holds the belief that time is a friend more than it is an enemy. Managerially, online karaoke platforms are further convinced of the importance of retaining their customers to generate long-term profit.

## 7. Conclusions

Understanding the dynamics of online karaoke virtual gift sending helps maximize its utility for all participants, including viewers, broadcasters, and platforms. However, extant paid gift-sending studies lack an integrated theoretical explanation for the incentives of paid gift-giving as well as practical implications that can facilitate the quantifiable implementation of service improvement. This study has successfully uncovered the motivation of paid gift-sending in an online karaoke context from a social exchange perspective. By observing the activities of 11,640 online karaoke users over one year, it was discovered that their gift-sending behaviors adhere to the patterns of more-follower-more-gift-sending and receive-more-send-more. Moreover, such patterns are more pronounced for collaborative users and one year after a user's registration compared to the same user right after registration.

Theoretically, this study extends the knowledge of social exchange discovered from PWYW studies to online karaoke paid gift-sending, a previously insufficiently explored new laboratory. Based on a theoretical framework that incorporates users, followers, gift-receiving, gift sending, time, and collaboration, this study adequately reveals the dynamics of paid gift-sending. The dynamics are manifested as the exchange of economic capital for social capital in a core-periphery structure, the direct and indirect reciprocation that creates group gain, which is embedded into the social network and that strengthens the belonging and bonding forces, and the two major categories of motivations of the social exchange, namely image-related utility and intrinsic utility, which are accentuated over time. Moreover, this study extends the scope social commerce studies from B2C to C2C scenarios in the karaoke industry, which has more complicated interpersonal dynamics.

Managerially, this study provides practical suggestions to online karaoke platforms in terms of service development and customer strategy. Suggestions include encouraging following or developing similar functions to continually enhance the core-periphery structure, stimulating collaboration or initiating other interactive activities to consolidate user sense of belonging and bonding to the platform as well as to the user network, injecting additional virtual gifts into the "market" so as to strengthen both customer satisfaction and reciprocation motivation, and retaining their customers to generate long-term profit.

One of the limitations of this study is that the dependent variables of this study were chosen as the frequency of sending gifts to broadcasters and the running total value of the gifts sent to broadcasters. Although these two variables are believed to be associated with customer satisfaction and platform (plus broadcaster) net income, there is no quantitative correlation as of yet. Therefore, future studies are encouraged to quantify the social and economic benefits of paid gift-sending. One potential way to manage this is to measure customer satisfaction by means of an online survey or user interviews. Another possible means is to obtain net income data from the platform. These additional constructs will certainly help generate a more complete research framework of paid gift-sending.

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