

"I Love the Feeling of Being on Stage, but I Become Greedy": Exploring the Impact of Monetary Incentives on Live Streamers' Social Interactions and Streaming Content

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Live streaming is an emergent social medium that allows remote interaction between the streamer and an audience of any size. Major live-streaming platforms in some Asian countries have a digital gift-giving feature that allows viewers to directly reward streamers during live sessions. Streamers can later exchange the digital gifts they have received for money, and this monetary incentive appears likely to influence how they interact with their viewers and generate live-streaming content. However, the precise nature and mechanisms of such impact have not previously been explored. Therefore, this qualitative study with 13 streamer participants examines how digital gifting influences streamers' motivations and the nature of both the content that they generate and their social interactions with their audiences. It reports that the digital-gifting function serves as a major incentive for active streaming, but may also disincentivize some streamers from continuing to contribute, for reasons that will be explored. Moreover, the participants devised strategies for both content generation and social interaction with the specific objective of earning gifts from viewers: practices that, in some cases, appeared to limit the quality of their live-streaming content. It was also noted that the streamers tended to have constrained social relationships with their viewers, in part because such relationships were seen as unequal or one-sided due to gift-giving behavior. The paper concludes with a discussion of design considerations for the incorporation of gift-giving features into live-streaming platforms, and additional recommendations for future research and the design of such platforms.

CCS Concepts: • **Human-centered computing** → **Empirical studies in collaborative and social computing**.

Additional Key Words and Phrases: Live stream; Livestreaming; Digital Gifting; Gift-giving; Streamer; Viewer; Qualitative; Monetary Incentives

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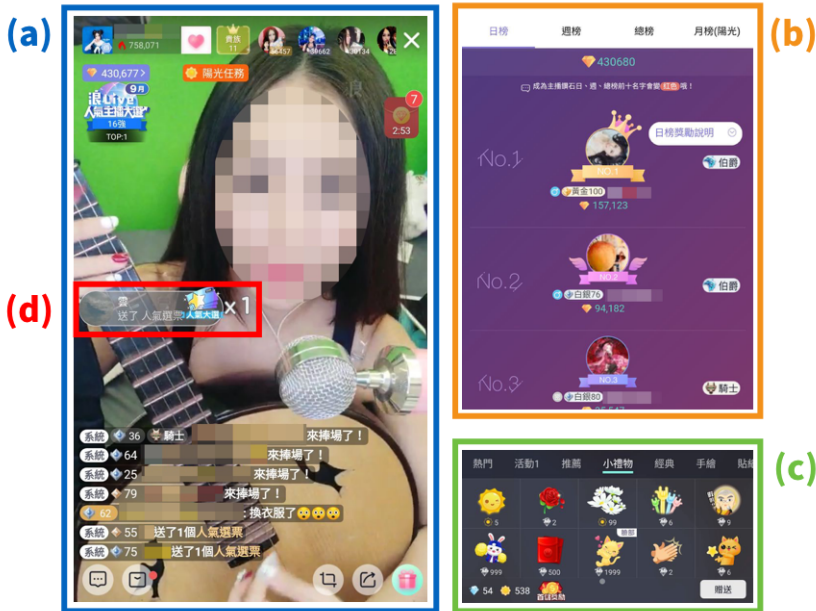


Fig. 1. A live stream on Lang-Live, including: (a) streaming video (top) and chatroom (bottom); (b) a ranking of online viewers who have sent digital gifts, in descending order of generosity; (c) a listing of such gifts with their prices; and (d) notifications about who has sent the broadcaster digital gifts

1 INTRODUCTION

Live streaming is an emergent form of social media that allows remote anytime/anywhere interaction via video streaming. Twitch.tv, one of the most prominent live-streaming platforms, has 15 million daily active viewers. Beginning in 2016, major live-stream platforms in some Asian countries introduced a feature that allows viewers to directly reward content generators — known as streamers — by buying and sending them digital gifts during live sessions; the streamers can later exchange each digital gift they have received for a fixed sum of money. To send a gift on some platforms (e.g., YouTube, Twitch.tv), viewers need to type a predefined text in the live-stream chatroom, whereas on others (e.g., Momo, 17.live) they simply select a digital gift from a list. The money received through gift-giving is then shared between the streamers and the platforms. In recent years, gift-giving behavior (referred to in some prior studies as "tipping") has grown explosively. Between Twitch.tv's launch of its gifting system in June 2016 and the end of that year, US\$5.9 million was collected on that platform alone. In China, the top 10 streamers all earned more than US\$700,000 from gifts in 2016 [10, 32]. In October 2016, one streamer performed a dance and received about US\$150,000 in gifts within one minute from a single adoring fan [2]. Although some expressed suspicions that this was just a marketing stunt masquerading as spontaneous viewer activity, there is no denying the importance of live-stream gift-giving as a new economic and psycho-social phenomenon.

Figure 1 illustrates a live-streaming platform (Lang-Live¹) that includes all the currently available major design features of such platforms. The differences among live-streaming platforms tend to

¹<https://www.langlive.com.tw/pc/index.html>

differ in terms of their digital gift designs and price ranges, rather than their interface designs [28]. Figure 1a is the main area for live streaming, which displays both streaming video and user messages. Figure 1b, meanwhile, indicates viewers' ranks, with the most prolific gift-givers at the top; and Figure 1c presents a list of gifts with their prices in diamonds, the currency used in the platform, where US\$1 = 180 diamonds. The price of the gifts on this platform range from US\$0.01 to US\$3,700 (the highest-priced gift, named "The Emperor's Gift", which costs 666,666 diamonds), with 75% of them costing less than US\$30. After a viewer selects a gift and presses the button, it is sent to the streamer immediately, and shown in the streaming video (Figure 1d). If viewers send the same gift multiple times in close succession, an animation displays the number of times they have done so.

The emergence of social-networking sites (SNSs) has allowed individuals to brand themselves on the Internet and become a *micro-celebrity* [22, 35]. Passionate innovators of many kinds of digital content, these individuals share it through social-media such as Facebook, YouTube, and Twitch.tv, in a phenomenon that has been deemed *social media entertainment* (SME) [11]. In addition to accepting donations from viewers, they can make profits from this activity in various ways, such as allowing the placement of advertising matter within or alongside their content, and/or sharing profits with their host social-media platforms, usually based on click rates [12]. As such, the attention they receive from consumers is the most valuable resource within an emergent "attention economy" [36]. The opportunities to be paid for doing what they love attract many people to jump into this market and generate authentic and original user-generated content (UGC) [12].

As such, most existing and potential micro-celebrities appear to be motivated by a combination of intrinsic incentives (doing what they love) and extrinsic (financial) ones to keep contributing UGC to platforms. As live-streaming evolves, its streamer-viewer interactions appear to be ever more social and engaging, as it becomes clearer that anyone can be a streamer, and viewers increasingly use embedded gift-giving functions — whether money, digital currency, or digital gifts — to show streamers their appreciation [42]. The present research is rooted in the insight that this real-time rewards mechanism may play a key role in live-streaming encounters.

Researchers have examined why and how diverse users engage in live streaming [18, 38]. However, only a few recent studies [28, 42] have explored either viewers' motivations for sending streamers rewards [28, 42], or the effect of this gift-giving on the recipients. Moreover, live streaming has been used to distribute a wide variety of content types, including game-play [19] — one of its most popular categories — as well as singing, dancing, and chatting [28, 38]. Yet, hardly any research has looked into the impact of monetary incentives (notably, digital gift-giving) on personal performances, or so-called "showroom performances" [28], especially from the streamers' perspective.

Given the sudden prevalence of gift-giving in live streaming, it is reasonable to suppose that the gifting environment could strongly influence both streamers' intention to create live-stream content, and their chosen modes of interaction with their viewers. Therefore, the present paper reports on a qualitative investigation of how digital gifting influences the nature of both the content that streamers generate, and their social interactions with their audience members, both inside and outside the immediate live-streaming context.

To achieve this, we recruited 13 active streamers who concentrated on personal performances, and conducted semi-structured interviews with them to explore how monetary incentives affected their motivation to live-stream, their streaming content, and their relationship with viewers. As the following sections will make clear, digital gifting operates as a major incentive for active streaming, but can also deter some individuals from streaming via the commonplace and close association between the aggregate value of the gifts one receives and one's streaming success. In other words, our results imply digital gifting's potential to change a streamer's motivation from intrinsic to extrinsic. In addition, the sampled streamers indicated that it was difficult for them to strike a

balance between earning digital gifts, on the one hand, and on the other, maintaining content quality and variety, since content they personally regarded as high quality was not necessarily associated with high gift income. That is, while digital gifts motivated streamers to create content in the first place, focusing on gifts could also cause deterioration in content quality subsequently. Moreover, the unbalanced nature of the digital-gifting paradigm seems to have led streamers to have constrained social relationships with their viewers, which in turn shaped their viewer-interaction behaviors.

The main contribution of the present work is a deeper empirical understanding of how digital gifting drives a range of factors that affect live-streamers' behavior, including motivation, streamer-viewer social interactions, and content-generation strategies. As well as filling an important gap in the theoretical literature on social media, we hope that the results will be of practical use to industry practitioners, including designers of future monetary-incentive systems.

2 BACKGROUND AND RELATED WORK

Live streaming is not a particularly new concept, but it has dramatically expanded in recent years. In 2011, a gaming and e-sport division of video-webcasting service Justin.tv was spun off as a new site, Twitch.tv, which grew dramatically, attracting 15 million active daily users as of May 2018 [39]. While Twitch.tv specializes in video-gaming live streams, other platforms for more general live-streaming purposes entered the market from 2015. In that year, for example, Facebook began allowing celebrities to webcast live events through Facebook Live, which then became available to general users in January 2016. Periscope, a live-streaming platform owned by Twitter, was launched in May 2015, and boosted by its integration into a mature social network, had acquired 2 million active daily users by January 2017 [4]. Most early streams were dedicated to remote viewing of mass-participation events that would normally be attended in person, such as ceremonies, concerts, political protests, and parties, though videogaming live streams were also among them [31, 38]. More recently, there has also been a trend of applying live streaming to educational environments and knowledge-sharing. For example, [13] pointed out educational live streaming's capability to form learning-focused communities, within which viewers and streamers mentor one another. Lu et al.[27] described the deployment of a tool to support knowledge-sharing live streams that leverage the viewers' availability during live streaming to document live streaming content in order to provide useful archives for learning, and showed how viewers' expenditure of effort during a given stream could enhance the quality of its knowledge-sharing. Taken together, such results indicate the potential of live streaming to foster community and to embody diverse content that may benefit streamers and viewers alike.

At the time of writing, most of the major SNSs in the United States allow every user to engage in personal live streaming, and live-stream content is becoming increasingly varied as a result. Some platforms, including YouTube and Twitch.tv, have started to offer tipping/donation/gift-giving functions that enable direct rewarding of streamers by their viewers, though it should also be noted that the live-streaming market in some Asian countries is flourishing and even bigger than that in the U.S.[32]. Beginning in 2015, around 900 Chinese live-streaming platforms, notably including Taobao, Tmall, and YY Live, have been launched by top business players, most incorporating gift-giving functions. Streamers who dance, sing, chat or even just eat food in front of the camera have attracted mass audiences; and this, coupled with the immense variety of live-streaming platforms, has encouraged thousands of people to perform personal shows on live-streaming platforms in pursuit of both creative outlets and financial success.

2.1 Live-streaming Research

Tang et al. [38] studied the use of Periscope and Meerkat, another mobile live-streaming platform, and found that the main categories of live-stream content were chatting and showcasing objects, places, or events. They interviewed frequent streamers about their motivations and practices, and found that most considered live streaming a means to building their personal brands. Streamers have also reported perceiving live streaming as an authentic, unedited view into their lives, and that they like the ways in which direct interaction with viewers shapes their live-stream content in real time. Haimson et al. [18] examined how viewers experienced Facebook Live, Periscope, and Snapchat Live Stories, and identified four dimensions — immersion, immediacy, interaction, and sociality — that made remote event viewing on these platforms engaging. Pellicone and Ahn [31], meanwhile, collected qualitative data from a game-streamer community to understand how its members organized their performances and interacted with their viewers. Their findings indicated that many of the respondents were eager to increase their viewer numbers, as this might help them in the difficult, highly competitive quest to be selected as partners by Twitch.tv, i.e., top-performing streamers eligible for profit-sharing with the platform. Lu et al. [26] studied intangible cultural heritage (ICH) streamers, who showcase and promote ICH-related activities. Based on interviews with 10 of these streamers and eight of their viewers, the authors identified key motivations for such streaming, as well as how ICH streamers leveraged live streams to engage their viewers with ICH more generally. Though dual-perspective approach provided rich insights of various kinds, the effects of digital-gifting system in live streams of this type were marginal. Lastly, Wohn [41], as well as studying the relationship between streamer and viewer, explored the experience and challenges of Twitch.tv's volunteer moderators. These individuals, who play critical roles in helping streamers manage their live-streaming sessions, were usually been chosen by streamers from among those viewers who had a positive influence on their channels and watched their live streaming frequently.

2.2 Live-streaming for Financial Gain

The numerous live-streaming platforms in Asia host an enormous variety of content, but most platforms share one common feature: they all support live-stream gift-giving, defined as a live-stream viewer's voluntary donation of money to the streamer through the platform [28]. Viewers reward streamers when they sing well, or display a remarkable level of videogaming skill; they send gifts to their favored player in a competition in the hope that this might help that player win; and gift educational streamers when they learn something from them [42].

Zhang et al. [44] conducted a participant-observation study of China's live-streaming platforms, and interviewed various categories of their stakeholders, including streamers, audience members, and guild founders. The guilds in question are associations that contract with streamers to manage their streaming content, assess their performance, and provide them with salaries based on their performance, as measured by the value of digital gifts they receive. Zhang et al. drew special attention to the important influence on live streaming's general atmosphere of these corporatized streamer guilds, which were created specifically to institutionalize live-streaming activities for profit. The same authors reported that streamers joining a guild would have to follow its strategies to maximize their potential to make money from digital gifts, at the expense of building communitarian or reciprocal relationships with viewers; and in practice, both the viewer interactions and content of streamers who are guild signatories are usually managed and controlled by the guild.

Yet, while digital gifting has become tightly integrated into the live-streaming experience, only a few studies to date have investigated its impact [24, 28, 42, 44].

Wohn et al. [42] indicated that viewers tended to give money to streamers because they appreciated the streamed content and because they had become emotionally attached to the streamers. Lu

et al. [28] provided additional examples of how viewers used digital gifts to interact with streamers in China: for instance, sending them as public messages of admiration, since every gift sent would be announced to all viewers. They also used gifts to capture streamers' attention, sometimes in the hope of developing deeper relationships with them. Lee et al. [24] further analyzed live-streaming video to visualize the impact of streamers' various interaction behaviors on gift-giving in live streaming. Some other studies [43, 45] trawled a large amount of data from live-streaming platforms, and found that most digital gifts were bought by a small proportion of viewers, implying that streamers' competition to attract the attention of this subgroup might be more intense than would otherwise appear. Yu et al. [43] found that streamer-viewer socialization was highly correlated with viewers' gift-giving behavior, indicating that having good social-interaction skills may be key to the successful pursuit of digital gifts. Although all these studies have provided important insight into live-streaming viewers' gift-giving motivations, however, no work to date has explored the impact of digital gift-giving from streamers' perspectives. Therefore, our first research question is as follows:

- **RQ1:** How does digital gifting motivate individuals to live-stream, and/or deter them from doing so?

There is reason to suspect that digital gift-giving's effect on live streamers' performances may be strong. One prior study [31] reported that even the displayed number of viewers in a live-streaming room directly affected the streamer's focus on his/her performance, and that streamers felt a hard-to-resolve tension between quantifiable metrics such as viewer numbers and unquantifiable ones such as "having fun". In general, research [16] in the field of economics has indicated that monetary incentives encourage more effort and better performance; however, some studies [3, 30] have proposed counter-arguments supported by actual cases. Liu and Feng [25], for instance, developed an analytical model to simulate how monetary incentives could affect the amounts of specific content creators' UGC. They concluded that, below a certain level, monetary incentives could affect users' overall motivation to contribute such content either positively or negatively, demonstrating a motivation crowding in/out effect [8, 25]; whereas above that level of incentive, the overall quantity of UGC contributions would always increase. However, the quality of UGC was found to be unrelated to the level of monetary incentive offered. Liu and Feng's interesting findings inspired the current study to explore the impact of gift-giving on streamers' content-generation efforts. Thus, our second research question is:

- **RQ2:** What are the effects of monetary incentives on live-streaming content?

It is also reasonable to expect that streamers will experience challenging interpersonal dealings with those viewers who send them gifts, and develop various strategies for protecting themselves [21]. Wohn et al. [42] explored live-stream viewers' reasons for supporting streamers, and identified six major motivations for various types of interaction, relating these to three types of support provision (emotional, instrumental, and financial). In particular, two streamer-viewer interaction factors – parasocial relationships, and social presence – were closely related to financial support. These results motivated us to further investigate how streamer-viewer interaction during live streaming is influenced by digital gifts. Seering et al. [34] investigated how real-time inputs from viewers could impact streamers and their content, and discussed several mechanisms for audience participation in live-streamed gaming, highlighting the beneficial influence of direct audience participation on streamers: e.g., prompting them to create more engaging narratives. Taken together, these previous studies reveal the collective power of audiences to affect how streamers build up relationships and interact with their viewers. Nevertheless, the influences of digital gifts and similar monetary incentives on streamer-viewer relationships and interactions have yet to be

comprehensively explored. Consequently, this paper also seeks to answer the following research question:

- **RQ3:** How do digital gifts shape streamer-viewer relationships and interaction types?

3 METHODS

3.1 Participants (Streamers)

From November 2017 to March 2018, we recruited 13 interviewees who had at least three months' experience of live streaming on platforms with gift-giving functions, using snowball sampling [9]. Two were male and 11 female; all ranged in age from 18 to 38; and all spoke Mandarin during their live streaming (Table 1). Most streamed on one of two popular platforms, *17Live* and *Lang-Live*, with the former having more than 40 million total users [29], and the latter, more than 200,000 active users per day [40]. The participants' experience as live streamers ranged from four months (ID=S1, F) to two years (ID=S13, F). Four reported that they streamed more than 20 days per month, and three that they streamed daily. All had a regular schedule for live streaming, and posted it weekly on their respective platforms' "Bio" pages for their viewers to access. The length of each live stream session ranged from 30 minutes to two hours. We conducted observations of each participant's live stream before we interviewed him/her. During these observations, we specifically focused on the content of the streamers' performances; how they interacted with viewers, including their requests for digital gifts; and the average number and value of gifts they actually received. Among the participants, three (Table 1, S10, S11, and S13), all of whom had more than 15 months' experience of streaming, had been top-20 streamers on their live-streaming platforms' leader boards; and each of the same three were earning digital gifts with an aggregate value of US\$5,000 per month or more at the time our study was conducted. The participants' rankings were usually calculated by reference to some combination of the total value of the digital gifts they received and their viewer numbers.

The mean monetary value of the digital gifts the other 10 interviewees earned in the two months immediately preceding their interviews was US\$300.50. Most of the participants' live-streaming performances were similar in content: e.g., chatting, singing, and dancing. Indeed, we only recruited streamers who live-streamed personal performances, in part to ensure that the between-subjects data were comparable, and in part because this type of streamer struck us as more likely to have given careful consideration to the costs and benefits of content preparation and viewer interaction. All of the selected streamers were also in charge of their own streaming content and managed their social interaction with viewers without the intervention of streamer guilds [44]. Additionally, it is worth noting that almost all prior live-streaming research from the streamers' perspective in the human-computer interaction field [19, 31] has focused on gameplay content, and we believed it would be beneficial to explore the personal-performance genre of live streaming, as part of an emerging trend in scholarship that has so far looked at ICH streamers, among others [28, 42]. However, it should be borne in mind that this choice of participants might limit the generalizability of our results to other types of streamers.

3.2 Interview Procedure

All interviews were semi-structured and conducted as video calls on Facebook Messenger or Skype, and audio-recorded. Before interviewing a given participant, one of the researchers would randomly select several days on which to observe that interviewee's live streaming, to gauge the genre and general texture of his/her live-streaming performance, as well as viewer numbers and engagement. Each interview lasted between 60 and 75 minutes. The participants were notified that they would remain anonymous, and that they had the right to refuse to answer any question.

Table 1. Background of Participants

ID	Gender	Experience	Fans Number	Age	Platform	Content/Performance in live streaming	Occupation
S1	F	4 M	46	18	17.Live	Chatting	Student
S2	M	4 M	564	24	Lang-live	Singing, Dancing, Chatting	Entertainer
S3	F	6 M	184	31	17.Live	Singing, Chatting	Salesperson
S4	F	6 M	626	28	17.Live	Singing, Chatting	Salesperson
S5	F	6 M	230	25	Up.Live	Singing, Chatting	Student
S6	F	6 M	5440	26	Lang-live	Dancing, Singing, Chatting	Entertainer
S7	M	8 M	556	38	Lang-live	Chatting	Teacher
S8	F	1 Y	992	21	Up.Live	Chatting	Student
S9	F	1.2Y	1700	24	17.Live	Playing a Violin, Singing, Chatting	Musician
S10	F	1.3 Y	40000	29	Lang-live	Dancing, Playing Games, Chatting	Entertainer
S11	F	1.4 Y	49000	23	Lang-live	Singing, Chatting	Student
S12	F	2 Y	9500	24	17.Live	Dancing, Chatting	Entertainer
S13	F	2 Y	150000	27	17.Live	Dancing, Selling, Chatting	Entertainer

Note: Experience (experience with being a streamer), Fans Number (Number of Fans showed on streamers' personal page on live-streaming platform). The occupation "Entertainer" suggests that the participant works as a singer, dancer, that performs for the amusement of others.

Each interview commenced with a question about the streamer's background, such as his/her career, age, fan group, or average income from live streaming (though we also encouraged each of them to share their back-end interfaces with us, and nine agreed to do so). Next, we asked them about their motivations for being streamers; how long they had been streaming; and how often they streamed in a week. Subsequent questions covered their attitude toward digital gift-giving. Specifically, we asked them to explain how important the money they made from digital gifts was to them; to describe their experiences of interacting with viewers around the practice of digital gift-giving; and to discuss how (if at all) they reciprocated their viewers' digital gift-giving. We then asked them to describe viewers they were familiar with, and explain whether they had developed or were likely to develop deeper interpersonal relationships with them offline.

To help us understand how the participants organized their live-streaming content, we asked them to describe how they prepared for live streaming in general, how long they spent on such preparations, and what the main themes or components of their live streaming were. Then, based on their own experiences, we asked them to point out the key strategies for convincing viewers to reward them with digital gifts, and asked them about their frustrations with being streamers. Lastly, we asked them to bring up any other relevant experiences that they wanted to talk about.

3.3 Data Processing

The authors transcribed all interview recordings, and categorized each response according to the questions' themes. Then, we hired a professional translator to translate the Mandarin transcripts into English before reviewing the results. We adopted the grounded-theory approach to qualitative analysis [15], which involves iteratively reviewing and labeling the responses with emerging codes, basing the initial codes on a review of data from the first five interviews. If a single response contained multiple concepts, it was split into multiple meaning-units in such a way that each could be labeled with a single code. Then, using the initial codes, two raters independently coded all the remaining responses.

The two raters' coding results were then compared to find disagreements, and possible revisions were discussed, including the addition of new codes where appropriate. Whenever the coding scheme was changed, each rater re-reviewed and labeled their responses again. This cycle was then repeated until the coding scheme was deemed satisfactory by both raters, and inter-rater reliability

had reached a reasonable level (>92%). The results were then interpreted in view of their relevance to the following three main themes: (1) the participants' motivations for being streamers; (2) how digital gifts affected the participants' strategies for and thoughts about content generation; and (3) how digital gifts affected the participants' interactions and relationships with their viewers. Each will be dealt with in turn in the Findings section, below.

4 FINDINGS

4.1 Streamers' Motivations

The majority of the streamers we interviewed indicated the importance of digital gifting as a monetary incentive for live streaming, and identified it as one of the most important factors in their decisions to start live streaming. For example,

"I started live streaming because I want to earn more money." (ID=S13, Female(F))

"The reason I became a streamer was simply to make profit because live streaming had been a trend for a while." (ID=S5, F)

In addition to making profits from being a streamer, some participants mentioned that they were motivated to live stream by their desire to perform in front of an immense audience in real time, and/or to use it as a means of self-branding. This applied both to individuals who were eager to become entertainers such as singers or actors (S4, S5, S8) and to those already earning their living in this field, including a cellist, a dancer, and a professional cheerleader (S2, S6, S9, S10, S12, S13). The former group was motivated by the possibility of building up a fan base, and the latter, by the flexibility streaming afforded them to showcase their talents and build up their reputations. As one member of the aspirant group explained:

"I would like to earn a position in showbiz, and I plan to maintain my [streaming] fan base as a way to achieve my dream." (ID=S5, F)

Another participant, who was already working as a professional singer and dancer, stated:

"The benefit of being a streamer is that you can schedule your work time yourself. Some streamers stream on a regular basis, while my schedule is a rather loose one. I can stream whenever I want." (ID=S2, M)

For many of the participants, the existence of digital gifting appeared to amplify the desire to perform. Some expressed amazement at the fact that digital gifting in live streaming allowed them to earn money and interact with audiences while indulging in their own love of performing.

"I find it fascinating that I can reach people with my hobby [singing] and also earning profit through it." (ID=S3, F)

"I love dancing, and love the feeling of being on stage. I still want to perform after I go to work, rather than just dancing on my own. I found it really nice that you could dance in live streaming and also make some profit through it." (ID=S6, F)

The amount of money earned from such gifts varied widely across the streamers, with some being motivated to stream by the massive income digital gifts brought them. One, who earned his entire living through digital gifts, said:

"[L]ive streaming brought me profits that I never imagined. It exceeds my total salary of day jobs. That's why I hope I will always be popular on live-streaming platforms and persist in my success, though I know it's also a matter of luck." (ID=S2, M)

Another streamer, who worked as a private Japanese-language tutor, earned less through digital gifts than S2 did, and perceived his streaming profits as a bonus to his existing monthly income.

He also regarded live streaming – in which he also taught Japanese – as an opportunity for professional growth:

"I have thought, worst case, if I can't make a better profit from live streaming after a year, I won't feel bad because my Japanese skills will be better." (ID=S7, M)

However, a few streamers reported being discouraged by the effects of digital gifting on their live streaming. For instance, some felt exhausted by the constant pursuit of digital gifts, or found themselves treating live streaming more or less like a normal job:

"I feel live streaming is like a job to me: seventy percent for work and thirty percent for fun. I feel really tired and want to skip my scheduled live streams sometimes. I enjoy chatting with viewers at times, but mostly I feel I'm here for work." (ID=S5, F)

Regardless of the absolute size of the sums they earned through digital gifts from viewers, the participants sometimes felt disappointed because of mismatches between their expectations regarding digital gifts and the reality of what they received. All of their platforms allowed viewers to send digital gifts at any time during live streaming, and this feature tended to loom large in streamers' efforts to maximize their gift income. However, viewers' gifting behaviors remained stubbornly hard to predict, or even confusing. As one participant put it,

"I felt really tired. I never understood what my viewers wanted. I spent lots of time preparing for streaming [...] but felt I wasn't getting the reception that I deserved. I became greedy. I wanted more gifts even when I'd already made a profit that was incredibly high." (ID=S10, F)

As the above quotations from S2, S5, and S10 suggest, though some participants' motivations for streaming were intrinsic, the monetary incentive (extrinsic motivation) was generally stronger. Because earning digital gifts can bring streamers considerable incomes, maintaining or increasing the quantity of such gifts became a core goal for most of them eventually. Importantly, most of the live-streaming platforms our participants were affiliated with did not require viewers to give any digital gifts. Thus, a viewer could go to any streaming room and watch without paying penny; and the presence of these "free-riders" seemed to reduce some participants' motivation to contribute UGC, due to a feeling that their profits were incompatible with the effort expended. This was especially true of streamers with relatively small viewer bases, but also discernible even among very popular streamers, further highlighting the importance of the monetary incentive to streamers' motivation.

"Some viewers think that they can enjoy those performances without sending any gifts. There will be more people like this over time." (ID=S10, F)

"I am worried that viewers who send me digital gifts may feel it's unfair that people who don't send gifts get the same attention as they do." (ID=S6, F)

4.2 Content Generation

Hardly any of our interviewees' live-streaming sessions lasted more than two hours, so unsurprisingly, they regarded the speed with which they could attract a large audience (and therefore substantial revenue) as vitally important. They also frequently expressed the view that attracting viewers was a competition, because most had only limited buying power for digital gifts, and therefore, streamers' gift income was in part a matter of sheer viewer numbers. Hence, most of the participants gave careful consideration to what they would do during live streaming, and were eager to differentiate themselves from others. Because anyone can become a streamer, it is not easy to stand out and attract viewers who will reward you with digital gifts. The solutions to this dilemma were extremely varied, ranging from streaming in Halloween makeup to giving serious,

thought-provoking presentations on Japanese culture (S7, M). But within-streamer variety was also vitally important:

"If you do the same thing over and over again each day, your viewers will get bored of it. So, I want my live streaming to be different each day." (ID=S3, F)

Among the common strategies for content differentiation was for the streamer to change his/her appearance. Often, this was achieved through switching make-up and clothing styles, or seeking out new locations from which to stream. Some also prepared content based on seasonal festivals. For example:

"I wore qipao while streaming last lunar new year. If there's any special occasion or festival, I will dress differently, or else I would just put on some makeup during my regular live streams. If I dress differently, the amount of gifts I receive will increase." (ID=S10, F)

However, some participants described the creation of original content as frustrating, and digital gifts appeared to be the main reason for such frustration. As noted above, many streamers were confused by their viewers' unpredictable digital-gifting behavior, and felt profoundly disappointed that, despite their efforts to create original content, they remained none the wiser about why gifts appeared when they did. As one said:

"I haven't figured out why I receive digital gifts from viewers when I do. Sometimes, I put lots of effort into preparing original content but get nothing. However, sometimes I do nothing special but get more gifts, well beyond my expectations." (ID=S6, F)

Many participants scheduled live streams almost every day to allow more viewers to see and interact with them, and thus enhance their chances of receiving more digital gifts. However, most who did so reported that preparing different content for each day was exhausting. For example, one stated that no matter how hard she strove to keep the content original, her viewers would grow used to it and lose interest fast, which led to drops in gift numbers:

"The viewers may become greedy. I did tons more things than before but they still seemed unsatisfied and didn't send me any gifts." (ID=S10, F)

In this context, it should also be remembered that none of our interviewees were full-time streamers, and thus might have had less scope than their full-time counterparts to prepare varied content that would satisfy their viewers' ever-changing, ever-growing appetites. As one put it,

"If you sang every day, inevitably you would sing the same song again. Even for a streamer like me who doesn't sing every day, I still find myself singing the same song 10 times." (ID=S4, F)

As noted earlier, despite their part-time status, several of our participants were entertainers, and all in this category prepared professional content for their live streams in the beginning. Crucially, however, all of them reported that viewers could not discern the effort and professionalism they put into such preparation, and that they felt doubly disappointed when this lack of appreciation was manifested as a lack of digital gifts. One, a professional dancer, addressed this issue as follows:

"I don't think viewers understand what a professional dance show is! I am a dancer and I include a lot of variation in each live-streaming performance, such as styles, songs, and, clothes. As a professional dancer, my style is more diverse, but my viewers just can't understand the effort I put into it. My fans are more familiar with the K-Pop style and could easily identify the difference. I never usually did a lot of dance based on K-Pop songs, but I do it now because they appreciate it more." (ID=S6, F)

Another professional dancer also registered her frustration at preparing distinctive, yet under-appreciated live-stream content:

"I don't just dance in my live stream. I tried to play the ukulele, and even do live tarot reading with my viewers. [...] Since I had a high popularity on the platform, I wanted to try and do something different from most of the streamers, to change the tradition of streaming. However, I eventually got tired and stopped streaming, thinking that I could invest my time better in other aspects of life. [...] A lot of viewers just care about your look, not your talents." (ID=S10, F)

As discussed above, difficulties in understanding their viewers' expectations regarding live-stream content appeared to discourage some streamers from preparing professional content, and/or prompted them to change their main performance focus or even cease streaming altogether. In addition, the quantity of digital gifts received seems to have been — or at any rate, to have become over time — their major metric of whether their performances and effort were appreciated. However, not all of our participants shared this perception of a link between effort or artistic quality, on the one hand, and gift income on the other. Instead, some reported that interaction was the key to collecting more digital gifts from viewers. Among the 13 people we interviewed, 12 had adopted a streaming pattern that consisted mainly of interacting with viewers, with original content making up a minority of their screen time. Moreover, all 13 streamers valued interacting with viewers more than they valued honing their performances, a phenomenon that could easily have resulted in unfocused performances. For instance, S9, a professional cellist, and S2, a professional dancer, commented:

"I played cello in my live streaming, but I still chatted and interacted with the viewers most of the time. Because if I kept playing cello without interacting with viewers, they would not send me digital gifts or even stay in my live-streaming room." (ID=S9, F)

"I can't interact with viewers when I am dancing, so when I do live-streaming I cannot just dance. I have to frequently stop and respond to viewers. Sometimes when I was singing, I would have to stop in the middle of a song to interact with them." (ID=S2, M)

Five participants (S5, S8, S9, S10, S11) went so far as to assert that their live-streaming content mostly comprised viewer-interaction activities:

"My live stream consists mostly of me taking song requests from viewers. I would then practice those songs and sing for them. [...] The main content in it is based on my interaction with the viewers." (ID=S11, F)

From a fan perspective, digital gifting could be used to encourage streamers to perform in ways that one prefers [24]. Conversely, from a streamer's perspective, the value of gifts received is clearly a key metric of whether one's performances have been successful, and a basis for deciding when content needs to be altered. However, our participants often indicated that the effort they expended on producing truly professional performances was not sufficiently appreciated, and speculated that this was because the thing the viewers really wanted most was interaction. These streamers therefore favored interactivity over professional content, and/or changed their performance styles, in an effort to obtain more digital gifts. In short, our data suggest that monetary incentives substantially influence not only streamers' motivations for performing, but also their perceptions of their performances.

4.3 Relationships and Interaction

Perhaps unsurprisingly, given that live-streaming platforms are classified as social media, the sampled streamers expressed considerable interest in building relationships with their viewers. As one participant stated:

"Live streaming is authentic. I love to interact and share moments with my viewers."
(ID=S12, F)

They also mentioned the necessity of interacting with every viewer, no matter whether that person had rewarded them previously, because catching viewers' attention is the first step toward enduring success. For example:

"In my live-streaming room, I don't leave anybody out. Because I'm not an experienced streamer, I'll try to interact with all viewers no matter if they ever backed me or not. I've learned from experience that fans may shift to other streamers if you don't pay any attention to them." (ID=S2, M)

"I mainly interact with people who are commenting a lot in my live-streaming room. I don't want to make people think if they don't send any digital gifts, they're not able to interact with me." (ID=S8, F)

Despite this widely expressed interest in building relationships with their viewers, however, most of the participants avoided becoming too intimate with them. In part, this was due to a concern that such intimacy might negatively affect the delicate balance of their relations with the other viewers. As one streamer explained,

"I was concentrating on chatting with one viewer, and it made the others feel awkward and unable to interact with me." (ID=S7, M)

Another participant described a situation in which, having become overly familiar with her viewers, they began to criticize her:

"Because I talked a lot every day, sometimes I didn't sound very good, and some viewers I knew pretty well would ask me to take a rest and skip the live streaming. But I didn't like them saying that. It's my live streaming, so I stream whenever I want." (ID=S4, F)

Some highlighted their strategies for preventing this sort of excessive intimacy. For example, they would think carefully about how their relationships were defined through modes of address:

"If I call them 'friends', I'm afraid they will think 'You should let me add you on Facebook if we're friends!' But I feel calling them 'fans' seems too distant. I still haven't found a better term, so just refer to my viewers as 'You' or 'Someone'." (ID=S6, F)

Interestingly, streamers tended to "draw a line" in such relationships, deeming many audience members to be unsuitable as "real" friends in their daily lives. Such ideas were embodied in how they managed their relationships with viewers on different social-media platforms: i.e., most would not connect with viewers on social media they considered to be private, and tended to maintain separate accounts that viewers could connect with them on. As one participant stated,

"It's impossible for me to add them [viewers] on my personal social media [Instagram]. People who watch your live streaming could not be considered as a friend. [...]. Although they send you some digital gifts, the relationship is already different. I cannot be friends with this kind of person. It's not a balanced friend relationship." (ID=S6, F)

Although almost all of the participants expressed concern about becoming too close to their viewers, they nevertheless attempted to maintain relationships with them that were characterized by regular interaction and expressions of care. We were not able to draw any firm conclusions about the reasons for this dynamic, but can speculate that the introduction of monetary incentives rendered

such relationships more like those between a shopkeeper and his/her customers than between friends who have no financial dealings with each other (e.g., S4, S6). In addition, the platforms' gift-giving mechanisms allow viewers to choose streamers and distribute their money among them; and thus, streamers must devote a certain amount of energy to maintaining relationships with viewers, simply to increase their chances of being rewarded by them. The following sections describe the three main patterns of interaction between streamers and viewers that we identified: (1) maintenance of long-term relationships, (2) reciprocity, and (3) strategic attempts to solicit digital gifts.

4.3.1 Maintenance of Long-term Relationships. As mentioned above, the sampled streamers' relationships with their viewers were usually "arm's-length" ones. Nevertheless, many of the participants preferred that such relationships be long-term, as this tended to increase the aggregate value of the digital gifts they received. Therefore, they adopted strategies aimed at maintaining their links with viewers over time: for example, encouraging them to support them with cheaper digital gifts, but multiple times, instead of expensive one-offs that — despite leading to occasional large spikes in the streamers' income — were ultimately unaffordable to their audience members:

"I don't want viewers to give me one big, expensive digital gift just once. Instead, I want them to spread that money across ten cheaper digital gifts and send them to me on ten different days." (ID=S8, F)

A related and indeed crucial consideration for streamers was finding truly committed supporters. This again involved the adoption of various strategies for identifying and interacting with such people, including "shout-outs" of their names, or even sending gifts to them. For example, one streamer (ID=S2, M) copied other streamers' tactic of saying, "Guess what my first song today is!" and using the answers to gauge which fans had been paying the most attention to him.

Some streamers also expressed appreciation for those viewers who contributed considerable time and effort to engaging with live streaming, and thus helped them maintain an interactive and positive atmosphere. Understandably, it was this group of viewers that became the focus of streamers' efforts to maintain long-term relationships with fans. As one participant explained:

"Some of my viewers are high-school students, so they don't have much money to send me digital gifts; but they will often be my companions from the beginning to the end of my live streaming." (ID=S4, F)

One option for streamers seeking to maintain long-term relationships with this more committed category of supporters is to create chat groups exclusively for them. Our participants who did so created these groups on other social-media platforms, because their streaming platforms did not provide functions that allowed them to do so. Mostly, the chat groups created by the streamers in our sample were based on *Line*², one of the more popular instant-messaging services in Asia. The participants who founded such fan communities reported that they would actively solicit particular viewers to join them. Those who did join could then chat with the streamer and other group members any time. Some streamers replied to these viewers' messages frequently, and also occasionally posted exclusive content such as photos of their life events in these groups, or even held regular (albeit infrequent) face-to-face fan meetups with the members, to maintain good relations with them.

"I would hold meetup with members of my chat groups three times a year. [...] For example, I would hold meetup on my birthday, and invite all members in my chat group to come." (ID=S9, F)

²<https://line.me/en-US/>

"I may share some pictures that I won't share on Facebook, and I also use the chat group to inform viewers when I will broadcast." (ID=S12, F)

However, a few streamers also expressed concerns about forming such chat groups: notably, that they might be troubled by obsessed viewers who frequently sent them unwanted messages. One streamer described her unpleasant experience with one fan:

"There's this one particular viewer who would send images to me frequently. [...] He also said some disturbing things like "I'm fighting for a better future for you and me." I had to close my chat group because of this annoying viewer." (ID=S8, F)

Another noteworthy form of viewer contribution was to act as a moderator in live streaming, facilitating interaction between streamers and viewers, such as by greeting other viewers and managing live-stream chatrooms (e.g., by blocking attempts at trolling) [31]. In line with prior research [41], our findings indicate that moderators were appointed from among those viewers who had followed a streamer for a long time, and/or who were eager to support the streamer despite a lack of money for digital gifts. As one participant put it,

"The amount of money does not necessarily equate to the level of their support. When some viewers volunteer to be moderators, I really appreciate their help." (ID=S13, F)

4.3.2 Reciprocity. All the streamers in our study mentioned feeling it was necessary to repay viewers in some way after receiving digital gifts from them. This feeling of indebtedness [23] even amounted to a sense of guilt in some cases. As one explained,

"I feel indebted to viewers when they send me gifts because it costs them real money. Some will even say that they're running out of money this month. I tell them, 'It's okay if you don't send me a gift.'" (ID=S1, F)

Another streamer stated that reciprocity was a healthy way to interact with viewers:

"Taking without giving back is dangerous. I would be seriously concerned if I received gifts from viewers without paying them back." (ID=S9, F)

Hence, the question of exactly how to repay one's viewers to relieve these strong feelings of indebtedness emerged as a major one. Some participants reacted to gifting by immediately shouting out the gift-giver's name during live streaming:

"Viewers would like you to shout out their names. That's one of their intentions when giving me gifts: they want to be noticed, not just by me but by other viewers." (ID=S7, M)

Some streamers even reported that they regularly sent physical gifts and thank-you cards to viewers who sent them expensive digital gifts, or those who might not send expensive gifts but showed deep support in some other way:

"Each month, I made handmade cards to express my appreciation to the ten viewers who sent me the most digital gifts." (ID=S8, F)

"Some viewers are not rich. They save money to purchase digital gifts for me because they want to support me. To reciprocate something as nice for them, I send them some physical gifts back: when I travel to other countries, I might buy some souvenirs and mail them to those viewers." (ID=S11, F)

In short, streamers expressed high levels of interest in and concern about how they reciprocated their audience members' gifts, and sought to maintain balanced, long-term interactions rather than to inspire infrequent but large gifts that viewers might ill afford.

4.3.3 *The Art of Soliciting Digital Gifts*. While the streamers were generally eager to earn digital gifts from viewers, they seldom asked for them directly, with some regarding doing so as inappropriate behavior. Others stated that they were afraid of being seen as only streaming for money, and therefore tended to hide their intentions.

"I feel like if you keep asking for gifts, you will be considered a really snobbish streamer. Everybody knows what streamers are up to, or have heard of it, but if you keep acting like that, you will end up with a bad reputation right across the live-streaming platform."
(ID=S3, F)

Therefore, the participants came up with a variety of strategies to encourage their viewers to reward them. The three most prevalent such approaches that were identified based on the interview data are each discussed in their own sections below.

Direct Gift Requests Despite the numerous qualms about it expressed by our respondents, we observed that asking for money directly was acceptable or even normal on many of these and other individuals' live streams. It also appeared to be effective: triggering gift-giving among those viewers who were motivated to send gifts, but had not done so yet, as well as among a smaller subset of the audience that felt obligated to fulfill the requests of streamers they supported. However, this strategy could easily cross a line, with several participants stating that if a streamer repeatedly asked for gifts, it deterred viewers from giving them. As a result, when as well as how such requests were made emerged as an important concern. Some streamers only solicited gifts right after they completed a performance, and/or asked their moderators to solicit gifts on their behalf.

It should also be borne in mind that live-stream platforms often hold contests for streamers in which gifts from viewers are required. At the time of our observations, the design of such contests varies somewhat across different platforms. For instance, some asked their streamers to compete individually based on the total value of digital gifts they earned in a stated period, sometimes as short as 10 minutes. The winners could be awarded additional digital gifts from the platform, while losers might be punished [44]. In our case, contest designs were platform-wide, lasted between a week and a month, and involved all of the streamers on the platform competing against each other based on gift value. A special leaderboard was shown on the live-streaming interfaces to inform viewers of each streamer's current ranking in the contest; and as well as with physical gifts (e.g. jewelry, clothes, or plane tickets), streamers who were doing well could be rewarded with higher rankings on the leaderboard. Such contexts provided a natural-seeming justification for gift requests. For example, some events required streamers to raise a specific sum in gifts, or to be given a specific gift within a set period of time. Moreover, on most live-stream platforms, the calculation of each streamer's rank or level includes the total value of gifts they have received, among other measurements. All the streamers we interviewed indicated that asking viewers to help them surpass such milestones by donating a specific digital gift or a specific gift amount was an effective strategy. As one put it:

"I think participating in the platform's competitions is a good chance to ask my fans for gifts. Some of them would try really hard [i.e., send expensive gifts] to help me win the game." (ID=S6, F)

In addition, some contests had special themes or focused on streamers who showcased a specific skill, e.g., singing, or playing a certain instrument. Streamers who rose to these challenges also tended to ask viewers to send specific digital gifts. For example, one streamer who played the cello said:

"There was a contest for streamers who play musical instruments. I therefore joined the contest and let my viewers know that I was participating. I also asked them to send

the right gifts that count towards the contest by telling them, 'Please send the right gift! I'm an instrumentalist, not a singer!'" (ID=S9, F)

Requests That Make Live Streams Engaging In general, if viewers felt engaged by streamers, they were more likely to send digital gifts. We found that an effective strategy for streamers seeking to improve streamer-viewer interaction was to request a certain type of message from viewers. For example, some streamers asked viewers to comment "66666" (which means "Well done" in Chinese online communities). The ease of this task was widely thought to have encouraged those who were usually silent to join in.

Similarly, some streamers would ask their viewers to just type "1" in the chatroom. When numerous "1"s then appeared, it was easy to see how many viewers were active and willing to give support (of a general kind) to the streamer, and potentially bond with him/her as a community. A variant of this practice, i.e., asking viewers to comment "1" if they agreed with a statement or "2" if they disagreed, served as a convenient way for streamers to gauge their audiences' dominant opinions.

However, increasing viewers' engagement was not the only reason streamers gave for such activities, which also tended to improve their rankings on their live-streaming platforms. As briefly noted above, such rankings usually depended on multiple factors including gift amount, chatroom activity, and numbers of viewers. This is no mere abstraction; if a streamer's rank is high, s/he has a higher chance of being seen by more people on the platform, and thus has better odds of earning a high gift income.

Interactions beyond Chatrooms Streamers usually remembered those people who sent digital gifts frequently and/or in large amounts, and proactively interacted with them, e.g., by greeting them when they entered the chatroom or exchanging private messages with them after live sessions. Such direct interaction was often mentioned as positively influencing the quantity of gifts a viewer sent.

Streamers also encouraged their viewers to form fan communities on their live-stream platforms. For example, some explicitly asked viewers to create, join, or invite others to join their fan clubs. Interestingly, such clubs usually required their members to change their IDs to follow some particular pattern, so that other viewers could spot the fans of a given streamer by simply looking at their IDs. And it was often from these fan clubs that a popular streamer would appoint one or more of the above-mentioned moderators, who monitored chatroom comments, blocked unwelcome visitors, and interacted with viewers when the streamer was busy (among other chatroom-management responsibilities) [28]. One streamer (ID=S11, F) noted that, in addition to such duties, her four moderators "*helped figure out the rules of a new contest on the live-streaming platform*". Conceivably, the sense of belonging that these fan communities engendered might have led their members to send more or larger gifts to the streamers.

As mentioned above, some of our participants created chat groups on other platforms (e.g., Line), exclusively for those viewers who had given them a certain level of digital gifts, using them to interact with these viewers more frequently than with others, even at times when they were not streaming, and sometimes even via face-to-face meetups. As well as facilitating more intimate streamer-viewer relations, fan clubs and chat groups helped streamers promote their live-streaming schedules. One participant mentioned using her chat group as a means of earning more digital gifts:

"My viewers would know that they can become more familiar with me personally [through the chat group] once they sent me a certain amount of digital gifts." (ID=S8, F)

In short, direct interaction with streamers plays an important role in reward-amount variation. This finding is generally compatible with prior research results from face-to-face settings [6, 17],

which suggested that enjoyable interactions and interpersonal connections between customers and service workers led to larger tip amounts.

5 DISCUSSION

5.1 Motivations

In answer to our first research question, regarding how monetary incentives affect live streamers' motivation, we found that monetizable digital gifts served as an important motivation for the participants to continue streaming on their platforms. This observation is in line with the rise of "micro-celebrity", whereby people leverage social-media platforms to perform, earn income, and build up their reputations [22, 35, 36]. In a similar sense, the sampled live streamers were motivated not only intrinsically, through a desire to perform, but also extrinsically, by the promise of earning additional income.

However, we identified differential effects of this reward system and its component features. Firstly, because live streaming enables real-time direct digital gifting that allows streamers to collect revenue more or less directly from their viewers, it differs fundamentally from other UGC platforms on which content creators make profits through revenue-sharing and product advertising. Although some prior studies [16, 25] have claimed that monetary incentives may have positive influences on intrinsic motivation, our findings suggest that one particular type of monetary incentive, digital gifts, may both encourage and deter individuals from contributing content to live-streaming platforms. Specifically, most of our participants experienced a motivation crowding-in effect when they started live streaming, regardless of the amount of digital gifts they initially received, due to their fascination with the promise of being able to simultaneously earn extra income and satisfy their desire to perform. However, some experienced a motivation crowding-out effect [8] after they began to treat their levels of gift income as metrics of their success as streamers, due to mismatches between their expectations about such earnings and the reality. Interestingly, this negative effect was reported not only by streamers who earned little digital-gift income, but also by those at the top of their game: implying that monetary incentives can disincentivize streamers from continuing to contribute, irrespective of their success or the lack thereof. In summary, it appears from our data that digital gifting on live-streaming platforms may change streamers' motivation from intrinsic to extrinsic, or — from the viewpoint of prosocial-behavior theory [8] — from altruism to greed.

Our findings therefore considerably extend scholarly knowledge of digital gifts' effects on live-streamers' motivation. Some prior research [44] suggested that such gifts could lead to the emergence of a profit-oriented infrastructure for stakeholders in live-streaming businesses, whereby streamers would prioritize money-making over other live-streaming possibilities. Others [26], in contrast, have highlighted live streaming's potential to attract different types of streamers who could be motivated intrinsically (e.g., to preserve ICH) despite knowing about the possibility of earning profits from their platforms. This study has revealed how personal-performance streamers under the influence of digital gifts can be motivated by both intrinsic and extrinsic motivation at first, but increasingly dominated by extrinsic motivation as time goes by. Therefore, the incorporation of digital gifting into live streaming should be considered carefully in light of this motivational dynamic.

5.2 Streamers' Conceptions of What They Perform

With regard to our second research question, on how digital gifts affect streaming content, our interviewees' responses indicate that generating original content for live streaming was increasingly challenging for them. This was chiefly because the mechanics and nascent traditions of real-time streaming effectively required each of them to perform a coherent, pre-determined routine while

simultaneously dealing interactively and engagingly with viewers' reactions to it: functions that, in any traditional medium, would be handled by different individuals, teams, or departments. However, most perceived a mismatch between the tremendous effort they expended on creating diverse, professional content and the meager numbers of digital gifts they received, with such numbers generally being regarded as closely linked to their performance's interactivity level, as opposed to its quality per se. This naturally led them to favor performing types of content that allowed for greater interactivity, even if this caused the professionalism of their performances to suffer, as often happened.

In short, digital gifts are like a double-edged sword. The possibility of making money can and does motivate streamers to create content; but at the same time, if they focus disproportionately on obtaining such gifts, it may cause deterioration in the quality of the performances that are, at least ostensibly, the central theme or purpose of their live-streaming activity. That being said, however, Wohn et al. [42] found that viewers tended to donate money to streamers specifically to help them maintain or improve content quality. Lu et al. [28] also found that viewers would send gifts specifically in appreciation of streamers' content. Although from a viewer's perspective this might seem a rational and effective approach to maintaining or improving the quality of a given streamer's content, our data indicate that it could nevertheless act as a constraint to content creation.

In a more extreme case of the dominance of extrinsic motivation, [44] indicated that their streamer participants were often asked to follow guidance from their guild aimed at improving the profitability of their live streams. Moreover, the streamers who accepted such guidance would be required to prioritize and repeat content or activities that were deemed more remunerative, such as co-broadcasting with other streamers, many times per day. In short, under the influence of guilds, streamers had less freedom to choose their live-stream content. This perplexing balancing-act between content quality and interactivity is a crucial issue that streamers should take more notice of. Recently, some reports have indicated that live-stream content in China is inclining to the monotonous [1], a finding that might represent further confirmation of the current study's observations.

Live-streaming platforms' ranking mechanisms might also be an important factor influencing streamers' motivation to create content. Most such mechanisms are based mainly on digital gifts' aggregate monetary value. The fact that climbing up the rankings resulted in more exposure and thus more potential to earn digital gifts could serve as a further incentive for streamers to focus on the interactivity rather than the quality of their streaming content. Similar influences of ranking were also discussed by Zhang et al. [44], who found that the design of leaderboards could facilitate the homogenization of streamers' practices. Given its potential to both encourage streamers to improve their performance, and to deter them from doing so, ranking systems should be more carefully designed. For example, the metrics used when computing ranks should be broadened to include viewer-retention rates and/or the diversity of live-streaming content themes. Using a wider array of such metrics might encourage streamers to provide more diverse content, rather than simply chasing trends or switching to the most lucrative content as soon as they discern what it is.

It is also worth mentioning the possibly differential effects of digital gifts on live streams with different themes. For example, Lu et al. [26] indicated that ICH streamers used live streaming chiefly as a means for promoting ICH activities for altruistic reasons, in contrast to the streamers we interviewed, who were mostly focused on self-branding and fulfilling their desire to perform. Although Lu et al.'s respondents also received digital gifts from viewers, some of them said they did not like this function because they wanted to offer equal access to everyone, including those unable to support them financially. We can infer from this that ICH streaming is likely to be driven by intrinsic incentives more than extrinsic ones. Some of our interviewees (e.g., S2 and S8: see section

4.3) expressed similar ideas; nevertheless, they shared our sample's general aim of catching as much of the audience's attention as possible, an approach whose net effects were likely to include increases in the numbers of digital gifts they received. As such, our data seems to suggest that the external incentive provided by digital gifts was stronger than the intrinsic one, desire to perform. In any case, differences in streamers' motivations across various additional live-streaming themes or categories is ripe for further investigation.

5.3 Social Interaction and Relationships

Regarding our third research question, about how digital gifts affect streamer-viewer social interaction and relationships, the most interesting effect we observed was the constrained social relationships between streamers and viewers. Specifically, the participants tended to "draw a line" in relationships between their viewers and themselves, in one or more of the following ways. First, they carefully managed their connections with their viewers on social media, defining certain SNSs as private, and excluding their streaming fans from their networks on them. Second, they endeavored to define their relationships with viewers semantically: for example, by avoiding calling them "friends". And lastly, the participants generally refused to interpret their relationships with viewers as normal friendships, because the mostly one-way flow of digital gifts rendered such relationships unbalanced. These findings are in line with those of Baym et al. [21] on how musicians used Twitter to build up their reputations and maintain relationships with their audiences. Generally, social interaction between streamers and viewers was perceived as an important factor in the former's gift income. Prior live-streaming research that focused on the viewers' perspective [28, 42] found that gifts or financial support to streamers were often inspired by a desire to interact with the streamer. Although we did not collect quantitative data that could be used to measure the correlation between interactivity and gift income, we can infer from a comparison of our findings against those of previous studies that such a correlation would likely be positive and strong. On the other hand, as noted above, our participants found it difficult to balance between interactivity and content quality; and even experienced, highly successful streamers (e.g., ID=S10) could find this so discouraging that they eventually ceased their streaming activity completely.

In addition, our findings suggest that the digital-gifting phenomenon tends to drive streamers to maintain long-term relationships with their viewers, but that such relationships remain superficial, based on the streamers' common insight that intimacy with one subset of viewers impedes the gift-giving behavior of others. Our interview data cannot directly confirm whether the streamers' observations about this are right or wrong; however, it seems intuitively correct that the emergence of a sense of reciprocity and familiarity between a particular streamer and a particular viewer might weaken the urge to gift among all other viewers [7]. Additionally, a strong monetary component in any human relationship may lead to an increased sense of social distance [20, 37], and streamers may therefore regard their relationships with viewers as relatively one-sided. For now, it is hard to say if the prevailing socially distant relationships between streamers and their audiences is harmful or beneficial to the overall social-media landscape, especially in light of Senft's [35, 36] critique of "over-sharing" online. Thus, the wider impact of this type of social relationship is worthy of in-depth investigation in future work.

Our findings also indicate that the norm of reciprocity [33, 42] plays an important role in streamer-viewer interaction. Prior studies have shown that viewers may donate money [42] or send digital gifts [28] to show their appreciation for the content that streamers provide. Our study found that some streamers were reluctant to feel indebted to those viewers who sent them relatively expensive gifts, and would send them physical gifts or cards in part to alleviate such feelings. Mostly, however, streamers endeavored to avoid feeling indebted in the first place, utilizing various strategies to encourage viewers to send them gifts while making it appear that this was not actually their main

priority. Such strategies tended to succeed when they led viewers to feel more engaged in the live-streaming sessions [28]. In contrast to the relatively reciprocal relationships our participants built with their viewers, however, Zhang et al. [44] reported that guild-signatory streamers minimized the creation of such reciprocal relationships. Because they focused more narrowly on gaining income from virtual gifts, Zhang et al.'s participants essentially commodified their relationships with viewers, treating them as assets rather than as truly interpersonal or caring. The discrepancies in these two studies' respective results could imply that the norm of reciprocity is reduced as streamers focus increasingly on making money, which in turn might lead to even greater imbalance in the streamer-viewer relationship.

5.4 Future Work

Our findings indicate that the likelihood of receiving digital gifts was a critical pull factor for individuals deciding to perform on live-streaming platforms. However, existing live-streaming platforms are widely seen as over-stressing the importance of earning digital gifts, not least as metrics of streamers' popularity and success, especially in some Asian countries. This leads many streamers to place excessive focus on the moment-to-moment tactical struggle to earn gifts, often to the detriment of both their intrinsic motivation and their content quality *per se*. Therefore, an interesting topic for future research would be potential ways of shifting streamers' attention from monetary incentives to intrinsic incentives, such as accumulation of social capital [14, 22], rather than the mere collection of digital gifts. Platforms directly helping streamers to create fresh and diverse content might be another pathway to improving intrinsic motivation, given that some people have used live streaming to safeguard ICH activities [26] for altruistic reasons.

In addition, our findings suggest that monetizable digital gifts may lead to atypical social interactions/relationships between streamers and viewers. Since this study only involved streamers, its results cannot comprehensively cover the issue of unbalanced relationships from both sides. Nevertheless, we hope that future research will address this issue. And, as more and more SNSs embed digital-gifting functions, we recommend that designers carefully contemplate the potential positive and negative effects of such reward systems on UGC.

5.5 Limitations

The present research has several limitations that should be acknowledged. First, all 13 of our interviewees streamed personal performances (e.g., chatting, singing, dancing, and sharing life experiences), and while this is one of the major categories of live-streaming platform content, with large audiences and high levels of viewer engagement [28, 38], our results cannot be expected to provide a rounded picture of live streaming in general. As such, other kinds of live streams (e.g., gaming) and additional gift-giving features should be addressed in future work on this general topic.

Second, the individuals in our sample were not full-time streamers; all still worked in traditional jobs, and most considered their income from live streaming to be supplementary. Thus, it is possible that our data elided fundamental differences of opinion or practice between full-time and part-time streamers around the issue of digital gift-giving. Moreover, one prior study [44] revealed that the involvement of guilds in live streaming can further influence streamers' perspectives on their own roles and the role of digital gifts. Among the factors that future research ought to consider is that streamers who sign guild contracts may be asked to pay high levels of monetary damages if they try to break such contracts off. However, future research on such matters would undoubtedly be challenging, due to guilds' preferences that their streamers not disclose details or opinions of streamer-viewer interaction, live-streaming content generation, or their business strategies.

None of our participants were under the control of a corporatized streamer guild. Streamers who are under such influence will ipso facto attempt to maximize the profitability of their live streaming [44]. We did not include this type of streamer in our study, since guild membership could potentially have had a confounding effect on our efforts to understand digital gifting's impact on streamers' motivation, content generation, and social interactions/relationships, especially as different guilds have different strategies and rules. Nonetheless, we believe that guild-affiliated streamers should be the subject of future work of this kind. In addition, only two of our participants were male, and this might have produced gender bias in our interview results. Therefore, although we have reported our findings in as much detail as space allows to prevent possible misconceptions, future work should consider utilizing gender-balanced samples of participants who are all either part-time or full-time streamers.

Third, recruiting streamers to participate in the present study was a difficult task, as we were only able to compensate each interviewee US\$20 for their time. Moreover, some interview questions might have been sensitive for streamers to answer: for example, those regarding their feelings about social relationships with viewers, and how they intentionally solicited digital gifts, despite their having been notified that their answers would remain anonymous. In addition, we adopted snowball sampling to recruit participants, and this technique's undeniable disadvantages [9] should also be counted among the potential limitations of this research.

Fourth, our study used qualitative methods to investigate digital gift-giving. In future, quantitative or mixed-methods approaches could provide additional vital insights into some aspects of live streaming, such as streamers' time management, evolution in the quality of their content over time, streamers' preference for a certain live-streaming platform, and streamer-viewer relationships.

Lastly, cultural differences [28] are a critically important issue that should be explored in future work on this subject. This is potentially a very rich and complex strand of inquiry, due to national differences not only in the uses and popularity of live streams, but in face-to-face tipping culture. In particular, we would like to explore the extent to which live-stream gift-giving is an extension of offline tipping norms [5], as opposed to a new phenomenon with its own emergent rules.

6 CONCLUSION

This study investigated how digital gift-giving influences streamers' motivation, interaction and relationships with viewers, and streaming-content creation. Our findings indicate how digital gifts can deter streamers from creating content as well as motivate them to do so, and that they may change streamers' motivation from intrinsic to extrinsic over time. Our participants also indicated that the difficulty of trying to strike a balance between earning digital gifts and maintaining content quality led them to favor content that allowed for greater interactivity, to enhance their chances of receiving more digital gifts, even if this caused the quality of their streaming content to suffer. Finally, we observed that streamers had constrained social relationships with viewers, and engaged in distinctive interaction behaviors with them, largely because the digital-gifting phenomenon impeded the formation of normal, balanced social relationships. We hope that this pioneering work on how digital gift-giving impacts live streamers will help future streaming practitioners and researchers to design more effective and sustainable live-streaming platforms and monetary-incentive systems.

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