Cross-platform Interactions and Popularity in the Live-streaming Community

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ABSTRACT

Twitch, a live video-streaming platform, provides strong financial and social incentives to developing a follower base. While streamers benefit from Twitch's own features for forming a wide community of engaged viewers, many streamers look to external social media platforms to increase their reach and build their following. We collect a corpus of Twitch streamer popularity measures and their behavior data on Twitch and third party platforms. We test the community-proposed relationship between behavior on social media accounts and popularity through examining the timing of creation and use of social media accounts. We conduct these experiments by studying the correlations between streamer behaviors and two popularity measures used by Twitch: followers and average concurrent viewers. We find that we cannot yet define which behaviors have statistically significant correlations with popularity, and propose future directions for this research.

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live-streaming, social media platforms, popularity, Twitch

INTRODUCTION

Live-streaming platforms are rapidly growing in popularity and becoming considerable economic forces. Content creators on these platforms, termed *streamers*, create channels to broadcast live videos to interested followers. We focus on Twitch[1], a popular U.S.-based live-streaming platform primarily used for video game streaming. There are tremendous social and economic incentives to gaining popularity on Twitch. For instance, the top streamers can make upwards of $4M/yr through a mix of viewer subscriptions and donations alone.

To this end, the Twitch streamer community has curated a set of behavioral advice for how new streamers can quickly grow their audience. Both official [2] and unofficial [6, 7] advice cite that a streamer's activity on social media accounts is highly effective to connect with audiences. It is yet unclear whether or not different behavior on social media accounts correlates with live-streamer success, and, if so, whether activity on different accounts applies equally. Forming a quantitative understanding of the correlation between behaviors and live-streamer popularity could provide a basis for how streamers should allocate their time. It also provides us insight into the interactions between platforms in the live-streamer community, allowing us to study how the streamer's follower community has developed on other platforms.

We collected a corpus of Twitch streamers that joined Twitch in 2016 and their broadcast information over their first two years. This data contains their activity on Twitch[2], as well as activity on the primary third-party social media platforms: Twitter, Instagram, and YouTube. It also contains several popularity measures that represent general social popularity (number of followers), active popularity (number of concurrent viewers during a broadcast), and financial popularity (number of cheers).

The focus of this early work is to study how the creation and use of Twitter, YouTube, and Instagram third-party social media accounts are correlated with the different popularity measures on Twitch. Overall, we find that activity on social media accounts, in general, highly correlates with Twitch popularity. However, the timing of social media account creation with respect to Twitch account creation, as well as advertising oneself on YouTube, are not related with Twitch popularity.

RELATED WORK

The Twitch platform and the Twitch community have both released advice on ways to interact with Twitch and other social media platforms to gain popularity. For instance, the Twitch Reddit community has posted advice on Twitch behavior to develop a follower base [1, 7–9]. One community guide [5] argues that Facebook, Twitter, YouTube, and Discord can help streamers reach new viewers viewers

[1] http://www.twitch.tv

[2] The Twitch-specific data was provided by the Twitch data science team.

and strengthen thee bond with existing audiences; it also warns against wasting too much time into developing a social media presence at the cost of improving the streamer's own broadcasting quality on Twitch. Twitch's own blog [2] describes the necessity of building a multi-platform social media presence as a means of creating a reputation as a streamer on more general social media outlets.

Other studies have looked at creating a sense of community internally on the live-streaming platform itself. Live streams both on Twitch and on other platforms such as Facebook Live and Periscope are partly engaging for viewers because of its "active spectatorship": viewers can comment and chat with other viewers and with the streamer in real time [3]. On the other hand, as the number of chat participants increases on Twitch's native chat feature, the quality and coherence of the conversation dramatically decreases [4].

In general, there are many community anecdotes about effective behavior and interaction on live-streaming platforms, yet relatively few quantitative studies. Our work specifically investigates which community-accepted behaviors with respect to social media activity are correlated with popularity growth over time.

Table 1: Number of accounts linked to on Twitch profiles per social media platform (above) and number of accounts actually scraped (below).

	Platform	# Accounts	Population %
1	Twitter	8268	47
2	YouTube	7398	42
3	Instagram	2692	15
4	Streamlabs	5839	33
5	Facebook	4193	24
6	Steam Community	2167	12
7	VK	1533	9

	Platform	# Accounts Scraped	Population %
1	Twitter	6292	36
2	YouTube	3264	19
3	Instagram	828	5

DATA COLLECTION

This study uses data from 17,682 Twitch users and 4 million broadcasts of streamers that started in 2016 and have been consistently streaming (at least once every two months) for at least one year. This data includes measures for follower counts and average concurrent viewership. On Twitch, follower count is defined as the number of Twitch users who follow an account, causing them to be notified when that account is live-streaming. Average concurrent viewership is calculated in the following manner: Twitch records the user's concurrent viewer count every minute that she is streaming, then sums these counts and averages them over the total stream duration. Our dataset includes the average of these data across the entire month interval, giving a month-long aggregation of average concurrent viewership. This data was provided by the Twitch data science team and did not require data cleaning.

Third Party Social Media Data

As the Twitch user data included the user's public profile information, we were able to use links on streamers' profiles to other social media accounts and scrape data that is publicly available from Twitter, YouTube, and Instagram. Using the Twitter, YouTube, and Instagram APIs, we collected all posts available through each API at the time of collection. We collected 6292 Twitter, 3264 YouTube, and 828 Instagram accounts. While streamers often link to other social media accounts, such as Discord, a gaming-centered chat app, and TipeeeStream, a donation website for streamers, these platforms do not provide public APIs.

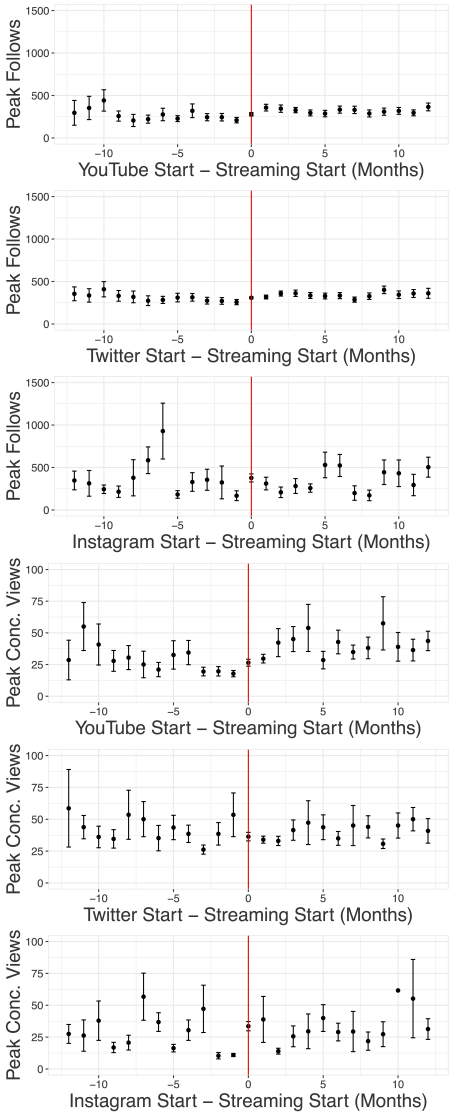

Figure 1: Mean and standard error of *peak follower count* (top three panels) and *peak monthly concurrent viewership* (bottom three panels) across the first year of the streamer's lifespan, grouped by start month of third-party social media activity in relation to start date of streaming.

TIME OF ACCOUNT CREATION

A streamer that is starting out without a social media presence may wonder whether creating a social media account is still worth it. Does the timing of when a third-party account is created have a relationship with eventual popularity? Or are they already at a disadvantage?

Figure 1 groups streamers based on when they started their YouTube, Twitter, or Instagram accounts relative to their Twitch account (x-axis). For example, 5 on the x-axis means that the YouTube account was created 5 months after the Twitch account. For each group, we compute the mean and standard error of the *peak follower count* (top three panels) and *peak monthly concurrent viewership* (bottom three panels) across the first year of the streamer's lifespan. By examining the maximum popularity that a user can achieve, we can study what the best outcome over the streamer's lifespan is given the start of a social media account at interval n.

We run Welch Two Sample t-tests to compare the populations of streamers who had social media presence before their streaming with those who created their social media accounts after. We find no statistical significance on peak follower count for each of YouTube (p-value: 0.058), Twitter (p-value: 0.128), or Instagram (p-value: 0.855). Testing again on peak concurrent views, we still find no statistical significance for YouTube (p-value: 0.09), Twitter (p-value: 0.935), and Instagram (p-value: 0.587). Figure 1 shows that for the different platforms and the different popularity measures, when the social media presence begins is not correlated with the peak popularity a user can achieve. In particular, streamers who begin broadcasting with a pre-existing social media presence do not appear to have an advantage over those that broadcast without a social media account, nor over those who develop their social media presence months later.

Even though the timing does not directly affect popularity, having a social media account in itself is correlated with popularity growth. Specifically, comparing the population of users who have a Twitter account—our largest set of social media accounts—and those who do not, we see a correlation with increased popularity in both follows (p-value: 3.13e-8) and average concurrent views (p-value: 0.026).

ADVERTISING ON YOUTUBE

One frequent piece of advice [5, 7] recommends using YouTube as an archival service for streams. Posting highlight videos to YouTube is popular because it advertises the most entertaining or technically impressive clips to potential viewers, and can help encourage YouTube viewers to find Twitch streamers they may want to follow. However, for a YouTube viewer to learn about the streamer's Twitch broadcast, the YouTube video description should include a link to the streamer's Twitch profile.

We identified three populations (conditions). The first are streamers that include such a link to their Twitch profile in their YouTube video descriptions (*Adv. on YT*). We found 404 such streamers. The second are streamers that link to their YouTube account on their Twitch profile but do not advertise

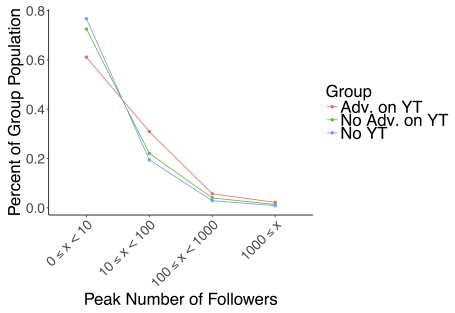

Figure 2: Distribution of populations that reach different categories of peak follower counts. Orange shows streamers who have a YouTube account and use it to advertise their Twitch account (n = 404); green shows streamers who have a YouTube account but do not use it to advertise their Twitch account (n = 2860); blue shows those who do not have a YouTube account (n = 14417).

(*No Adv. on YT*). The third are streamers who do not link YouTube accounts on their Twitch profile, and therefore do not have a known YouTube presence (*No YT*). Our main question is whether the distribution of peak follower count differs between the groups?

We grouped the streamer population of each condition into four buckets based on their peak follower counts (< 10, 10 to 100, 100 to 1000, and ≥ 1000 followers). Figure 2 plots the percentage of streamers in each condition at each level of popularity. We see that the distribution for *Adv. on YT* appears more skewed toward higher follower levels. We run Welch Two Sample t-tests to compare the populations of *Adv. on YT* with *No Adv. on YT* (p-value: 0.119), *Adv. on YT* with *No YT* (p-value: 0.529), and *No Adv. on YT* with *No YT* (p-value: 0.107). We do not find statistically significant differences between the populations. It does not appear that the peak follower count a streamer can achieve is correlated with advertising one's Twitch-profile on YouTube.

CONCLUSION

Our study is believed to be the first quantitative study of the relationship between specific behaviors on social media platforms and popularity on live-streaming platforms. We find that although the Twitch community strongly believes in the effect of social media activity on popularity, we have not yet traced behaviors on Twitter, Instagram, and YouTube that correlate with popularity. In future work, we will be examining more specific questions about how exactly social media platforms should be used, such as announcing on Twitter to notify the start of a live-stream, posting more frequently on each of these three platforms, or archiving different types of videos on YouTube, such as stream highlights, uploads of the entire stream, and even entirely unrelated videos. Further, we would like to explore interactions of the communities of streamer followers on third-party platforms to see how communities form around a particular streamer. For example, we would like to analyze directed graphs showing which streamers mention other streamers on Twitter to see how relationships formed on Twitch extend to other social media platforms. Through understanding what effective usage of social media platforms looks like for live-streamers on Twitch, we hope to suggest how streamers may best spend their time outside of streaming to grow popularity.

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