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THE STRUCTURAL ROLE OF USER CLASS IN CHAT INTERACTIONS ON TWITCH

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Background

Twitch.tv is a live video streaming platform with more than 100 million monthly visitors connecting to 2.2 million channels (Twitch, 2017). In 2014, it was the fourth-largest source of U.S. Internet traffic (MacMillan & Bensinger, 2014). Twitch is also relevant globally, with 79% of traffic coming from outside the U.S. (SimilarWeb, 2018). In Taiwan, one-fifth of the population are active users (Shu, 2015).

Twitch is organized around user-generated video streams, which typically show the streamer's screen as they play a video game. The stream is accompanied by a chat room, in which viewers can offer discussion, commentary, feedback and suggestions.

The platform structure of Twitch undermines conventional typologies such as the tripartite framework of *players*, *commentators*, and *spectators* proposed by Cheung and Huang (2011) to describe e-sports communities: Streamers will often commentate on the game as they play (Smith, Obrist, & Wright, 2013; Walker, 2014) and spectators will often use the chat room to comment both on the game and on the streamer's performance (Nascimento et al., 2014). Hamilton, Garretson, and Kerne (2014) have argued that Twitch channels are *participatory communities*, building on the tradition of IRC chat rooms by adding a rich, shared experience.

Yet there remain divisions within the Twitch user base: While viewers may offer advice, it is still up to the streamer to play the game and guide the core experience (Walker, 2014). Within the chat room, privileges are accorded to moderators and paid subscribers of the channel, which may affect their status and influence (Hamilton et al., 2014). After being purchased by Amazon in 2014, "Prime" members may also access certain premium features on Twitch (Snider, 2016).

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This study aims to offer a quantitative framework for analysing user interactions in Twitch chat rooms. Of particular interest is the potential stratification of user groups and how this interacts with the economic concerns of the platform, of the performers, and of the general user base.

Methods

An initial convenience sample of six Twitch streams was taken in November and December of 2017. Criteria for selection were a listed primary language of English, a concurrent viewership of between 300 and 1500, and a listed activity related to video games. The chat for each stream was logged for a period of two hours using *Chatty* (Version 0.8.7).

Chat logs were automatically coded using *twitch-chat-net* (Version 0.1.1), a utility developed for the purposes of this research, which parses usernames and chat messages using an adaptive dictionary-based method to produce a list of users who are active in the chat, along with their user class, and a list of directed interactions between users.

These lists were used to generate complete network models of the directed interactions between users in each chat room. Each node of the network represents a user who is active in the chat and an edge is placed between the sender and receiver of each message, weighted by the number of messages sent in each direction.

Results

Network models were analysed in terms of three different measures of nodal centrality: *closeness*, *betweenness*, and *degree*. These are typically interpreted as user-level indices of *connectedness*, *control*, and *involvement*, respectively (Kouznetsov & Tsvetovat, 2011; Prell, 2012). For each index, there were significant ($\alpha = .05$) differences between the centrality of moderators and other users, and between subscribers and non-subscribers. Notably, there were no significant differences in the centrality of Twitch Prime users. This suggests that being a moderator or channel subscriber is associated with higher levels of social engagement and status within the community, whereas being a Prime member has only a negligible effect.

User classes were also analysed using the E-I index of homophily. *Homophily* refers to the principle that actors that share characteristics will be more likely to form relationships (McPherson, Smith-Lovin, & Cook, 2001). Indices of all user classes supported a tendency towards homophily; however, the magnitude of this effect varied substantially. In most networks, homophily was weakest amongst moderators, consistent with their outwards-facing role in the community.

Discussion

The observed differences in nodal centrality suggest that the act of paying for access may not reflect an intent to engage socially in that space, whereas overt expressions of

affiliation may have more weight in this regard. Given that revenue from subscriptions is directed towards a particular channel, and that the icon indicating a subscriber in chat is unique to each channel, rather than the generic Prime icon, it may be that paying to subscribe to a channel is more akin to supporting a favoured artist than to paying a simple fee for content. The centrality of subscribers in chat discussions demonstrates the ways in which monetization and social stratification complement one another in participatory communities: There may be competitive advantages, as well as cause for concern, in monetization strategies that leverage specific group affiliations and social status to attract and retain paying users.

The observation of homophily on the basis of user class is significant in that it indicates that homophilous tendencies may emerge over the course of relatively short-term, ephemeral interactions. In contrast to past research, there are very few social cues on Twitch that allow users to ascertain many traits, such as race, class, and gender. Yet, it appears that homophily may nonetheless result from status cues as innocuous as an icon next to one's username.

The non-probabilistic nature of the preliminary sample gathered for this analysis limits the generalizability of the findings. As such, the next step will be to develop a more systematic sampling method for the platform. Combined with the tools and workflow developed in this initial stage, this will permit the analysis of Twitch chat interaction at a more comprehensive scale.

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