

# Profiling Livestream Spectators

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## ABSTRACT

The livestream industry has developed tremendously over the last decade. A recent trend is to make spectators more engaged by adding features to enable interaction with streamers, players (hosts), or other spectators. Our research focuses on designing and evaluating interactive spectator experiences. This paper describes the initial stages of our current project on developing a spectator-specific user typology that aims to help developers better understand their target audience. Here we report on the development of a survey and pilot study based on a popular typology for users of gamified apps. Our initial result highlights several hints of possible trends in spectators' interaction preference depending on their user type. Using these findings, our immediate next step is to design and conduct a study to validate the observed trends and study the correlation between spectators' user type with interactive livestreaming features.

## KEYWORDS

Digital Games, Livestreaming, Game User Research, Spectator Experience, Spectator-Player

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## 1 Introduction

Twitch.tv [13] is one of the first and most popular streaming platforms. According to *Twitchtracker* [14], a statistic tracking site for Twitch, the site has had over 1.85 million average concurrent viewers in the first quarter of 2020, a 47% increase from last year's overall average. The same site also indicates 73,000 average concurrent live channels, also representing a 47% increase over the past year. Although these significant jumps in numbers may be due in part to the global stay-at-home initiative caused by the SARS-CoV2 (more commonly known as COVID-19) pandemic.

However, streaming has been steadily gaining popularity over the last few years.

Livestreaming has transitioned from a novel form of media to the mainstream. Livestreaming can be seen as a combination of two forms of media, viewing broadcast content and playing video games. What makes livestreaming more engaging than traditional broadcasting is that it enables spectators to interact with one another as well as the host in many scenarios. However, the experience is generally not as interactive as playing a game oneself. Arguably, providing spectators with more opportunities to interact may make participating in a stream more engaging.

The ability to socialize with other spectators as well as the host in real time (e.g., via text chat) has created a new experience that is very attractive to many spectators. In our previous work [10], we highlighted various other features that can make spectating a more interactive experience. Active interaction can provide a more immersive experience than traditional broadcast media, while benefiting hosts by enabling better viewer retention [4]. Video game publishers also acknowledge that having their games streamed is a great form of advertisement [6].

Building on our previous work, we aim to identify how spectator characteristics can affect motivation to interact with streams, other spectators, or even the game content. In doing so, we can develop a guideline for video game developers to enable innovative features that encourage spectator interactions which would enhance both gameplay and the spectating experience.

We are ultimately developing a streaming-specific user typology system for recommending feature sets for developers, based on a similar system used in games user research [1,11] to help developers better understand their target audience. This paper reports on our progress in developing and deploying a preliminary survey to explore the possibility of a meaningful relationship between a spectator's profile and which interactive features they prefer. This will offer insight into whether an existing typology system could be adapted for our purposes, or if a new typology specific to game spectators is warranted.

## 2 Related work

Understanding the personalities of any user population is a complex endeavour. To begin our journey, we must explore how user motivations shape behaviour and preferences. With this goal in mind, we have focused our background research on the motivations

of game spectators and existing frameworks for user typology in games user research.

## 2.1 Spectator Interactions and Livestreaming

Video games are intended to be an active form of entertainment. However, with the success and wide adoption of livestreaming as a form of viewer experience, there is also a demand for consuming game content in a more passive way [9]. Sjöblom et al. described traditional spectating media mainly as a form of unidirectional activity and playing games as a multi-directional activity requiring participation from all sides. Streaming, then, combines aspects of both media, leading to a new form of spectating experience that is more passive than playing video games, but more active than traditional media. Over the years, hosts have found creative ways of involving their audience, such as chat rooms or polling viewers on what to do next. One noticeable example of this was during the phenomenon of *Twitch Plays Pokémon* [8], where a massive online audience controlled a game of *Pokémon* through text chat. Each second, the most requested action was used as input for the game.

Twitch's success can be attributed to several factors. Beyond its ease of use, allowing anyone to stream with some simple software and basic equipment, another major draw is the ability for interaction between the stream host and viewers through the chat feature [3], where spectators can socialize with each other as well as the host. Other forms of interaction that are popular today are mostly monetary, such as donation messages, where viewers can donate money to support the host while also leaving a message that is typically read out for the audience. Hamilton et al. [4] investigated social motivations for stream viewers, noting that this type of social interaction had never been seen before in any previous media format. The fact that spectators can directly socialize with stream hosts enables a level of personalization that was not previously possible. The same study also discusses how spectators watch not only to observe the streamer's skills, but also events such as reactions to unexpected situations and interactions with others.

A more recent work by Stahlke et al. [10] explored the design and evaluation of different game mechanics that allow for interactive spectator experiences. Such features included experimental aspects of eSports, such as betting on game outcomes, and games like *Super Mario Maker* [15] that use player-created content, enabling streamers to play levels designed by their audience.

Just as different players are naturally attracted to different features in games, we hypothesize that the same thinking can be applied to the design of interactive streaming experiences. In theory, spectators with different habits and personalities should also be attracted to specific features that will motivate them to participate in a livestream. This ideology has formed the main inspiration for our present work.

## 2.2 Player Typology

We reviewed recent literature in the space of user typology, seeking to ground our survey in an existing typology model. Many early typology scales were driven by the need of game developers to understand user motivations, and the features that should be implemented to appeal to different players [1,11,16]. Over the years, other typology frameworks have been developed, often grounded in player psychology [2,7]. One of the earliest works of player typology was documented and summarized by Bartle [1]. This initial typology model focused on massively multiplayer online games known as MUDs (multi-user dungeons). The result of this study revealed a player typology framework offering insight into the different features that attracted players to a given game. However, this model is less applicable outside the MUD genre. More recently, Tondello et al. have developed frameworks that help developers decide what features to include in their games based on the genre of game they are developing and on the user's goal orientation [11].

We decided that the Hexad framework developed by Tondello et al. [12], developed for users of gamified applications, was most relevant to our work. Though viewing a livestream is not in itself gameplay, many of the interaction feature sets are very similar to features which can be used for gamification. Thus, we think this is the most appropriate typology system to help us define the stream spectator population. The following are the different Hexad user types: **Free Spirits, Achievers, Philanthropists, Disruptors, and Players**. Each user type is described later in the results section.

## 3 METHODOLOGY

The survey questionnaire was divided into three sections, first asking general demographic questions as well as questions to verify that participants have general knowledge and are active spectators of video game streams. The second section consists of five-point Likert scale questions from the original gamification player typology framework by Tondello et al. used to determine the user's Hexad type [12]. The last section then asks the user to rate their preference of different ways to interact with livestreamed game content. These features are those identified by Stahlke et al. [10], and include:

1. *Expressing their opinion through **voting or polling***
2. *Declaring their **allegiance** to a particular player or team*
3. ***Wagering** in-game or streaming channel-based currency (no monetary value) on an outcome*
4. *Spending money to **display special emoticons or an on-screen message**, or have the streamer react a certain way/read out a message during the livestream*
5. *People (may or may not be active players) providing **informed insight** on player behavior/mechanics/the events in game*
6. ***Directly interacting in the game world** with streamer(s), potentially accessed by entering and winning a lottery.*
7. ***Submitting original game content** (ex: levels) to streamers for them to play and broadcast*

8. *Having indirect influence over elements of the game world. (ex: spawning more enemies, sending in-game resources, changing the visual of the game. etc.)*

We also asked participants at the end of the survey if any of the included interaction features were confusing, or if there were additional features not covered by the survey that they were aware of. This served as a way for us to improve future survey quality as well as gather information on new features which we might have overlooked.

For data collection, we chose a population of video game development students. We took our sample from this group as we could ensure that all participants understood game features and had some familiarity with consuming and/or broadcasting livestreamed content. We sent out an announcement seeking participants through a public forum in the game development program. Participants were sent a link to a Google Forms version of the survey which they completed on their own time.

### 4 Result and Discussion

We analyzed our data through expert analysis with fellow games researchers. We visualized the data using a Likert graph and interpreted it graphically to identify trends. We first looked at each interaction feature's appeal level for each of the Hexad types. Through brainstorming and discussion, we speculated as to why certain patterns may emerge between the different user typologies and their preferred features.

In total, we gathered 50 responses to our survey and excluded participants that belong to more than one Hexad types, with the majority of the population aged 18-25. 83% of the participants identified as male and 17% identified as female. Over 90% of our population indicated that they are very familiar with playing video games and over 70% have at least some experience in watching livestreams.

After the analysis, there are some notable trends which we have highlighted below. These findings can be divided into two sections. The first section is trends that stand out with each of the individual Hexad typologies. The second is other observed trends that are shared between all Hexad typologies within the participant population.

#### 4.1 Hexad Personality Trends

*Socializers* show a preference towards affiliation features that can be understood as they like associating themselves with others and are motivated by relatedness. They also show a strong favorability towards *chat input*. This is a feature we expected socializers to find appealing, as it motivates the spectator to socialize with other spectators as well as the stream host.

About half of the population that were identified as *Players* find affiliation appealing. Since players are motivated by extrinsic rewards, affiliation with the winning team or player is one the extrinsic rewards which can be strongly attractive. 36% of player-

type participants found *betting* appealing; this is also logical as betting would result in potentially large rewards. *Commentaries* was another big feature which they found attractive. We speculate the reasoning for this is that it can provide information on the most effective methods to maximize their own potential rewards as players or the possibility of gaining a reward for just watching and participating.

*Philanthropists* are motivated by purpose and meaning; they like helping others without any expectation of reward. This is also

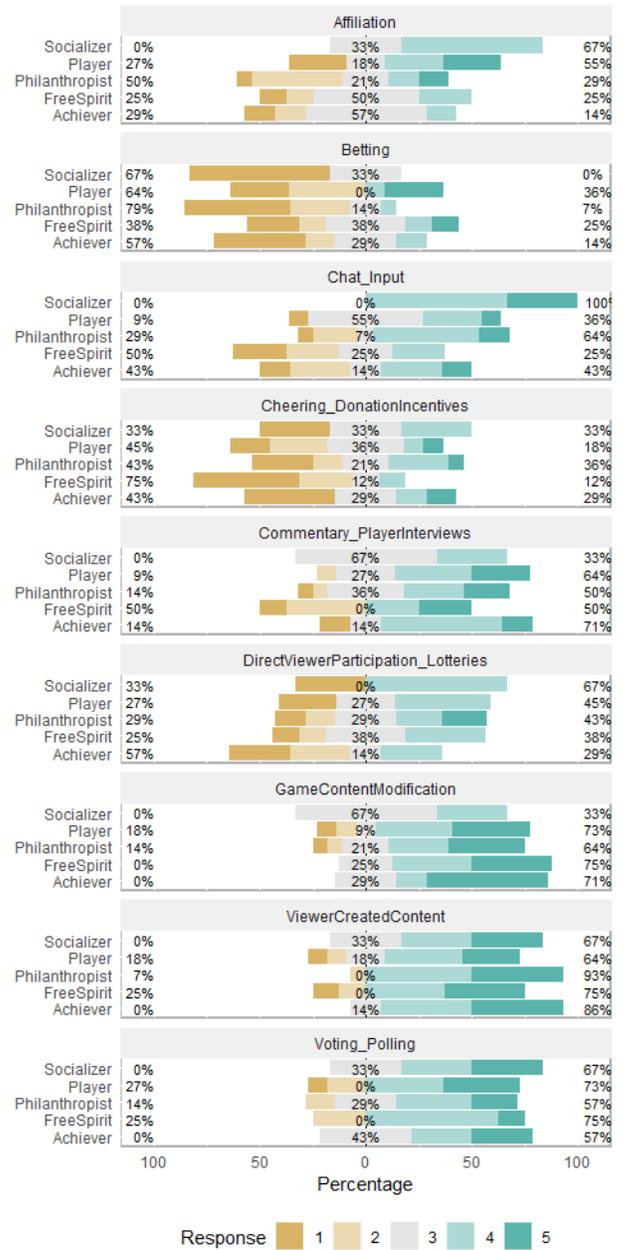


Figure 1: Different user types and their appeal level for each of the different proposed features

reflected in the features which are most rewarding to them, *cheering donations* and *viewer-created content*. Although most participants rated cheering donations negatively, philanthropists had the most positive ratings at 36%. We think this can be understood as recognizing the support provided for the streamer's career, as donations are speculated to have a significant impact on a streamer's early income and possibly determine if they can sustain and grow their streaming career. This in turn gives them a purpose. Philanthropists also showed the highest ratings for-viewer created content. Viewer-created content can be time consuming to make and does not generally carry a monetary reward. We speculate that offering up great content for both the streams as well as other spectators to enjoy lends these interactions a sense of purpose.

*Free Spirits* are motivated by autonomy and self-expression; these qualities are embodied by the features which they found to be appealing. Free spirits demonstrated the most positive attitudes towards *game content modification* as well as *voting and polling*. We speculate that the ability to express themselves by having direct impact on the game the streamer is playing is what appealed to them. Voting and polling are also expected results as they are a relatively easy way for spectators to exercise their influence.

*Achievers* are motivated by mastery; they seek knowledge, self-improvement, and overcoming challenges. Consequently, features that help them to improve themselves should be the most appealing to them, and this is reflected in their strong preference for *commentaries* and *player interviews*.

*Disruptors* are motivated by making change; they want to disrupt the current system either directly or through others to inflict positive or negative changes. Unfortunately, none of our participants were classified in this category and thus we have no data on this Hexad type.

## 4.2 Other trends

Overall, the population have demonstrated strong negative attitudes towards almost all features involving monetization and chance (*betting, donation incentives, participation lottery*). A possible explanation of this trend is that throughout the last few years, many games are implementing microtransactions as well as loot box mechanics that are very similar to gambling, which have experienced large scale pushback from players [5]. Another contributing factor is, as all the participants have background knowledge on this subject, it could have potentially influenced their responses.

There is an overwhelming amount of appeal from all participants for *game content modification, viewer-created content, and voting/polling*. These features focus on user-created content and decision making. We speculate the reason for this appeal is that these features permit participants to directly interact with and connect meaningfully to stream hosts. This offers a more interactive experience that contributes to a spectator's feeling of importance and engagement.

*Commentaries* and *player interviews* were largely well-received by participants. We speculate that, due to its already widespread adoption into most eSports streams, most of our participants are already familiar with it and either find it beneficial or are indifferent to its effects.

## 5 LIMITATIONS AND FUTURE WORK

Since our participants are game development students, it is fair to assume they all have a passion towards game content modification as well as viewer created content regardless of their Hexad type. This may have made these features seem more appealing than they would be for a general audience. In future studies, we intend to diversify the overall demographics of all participants, including age, career path, location, and gender.

We also realize that the small sample size surveyed in this initial study does not allow us to make any strong claims. However, we believe that this has been an important first step in answering our key questions regarding spectator typology and preferences for different interactive opportunities. The results gathered by the survey also helped us to identify some key trends which could provide a basis for future work in this area. Our immediate next step is to conduct a full-size study using our survey to examine whether our hypothesis and the trends observed can be statistically verified.

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