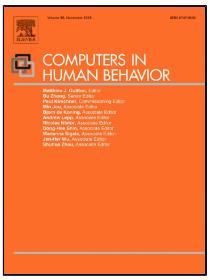
Accepted Manuscript



The ingredients of Twitch streaming: Affordances of game streams

Max Sjöblom, Maria Törhönen, Juho Hamari, Joseph Macey

PII:	S0747-5632(18)30496-5
DOI:	10.1016/j.chb.2018.10.012
Reference:	CHB 5746
To appear in:	*Computers in Human Behavior*
Received Date:	29 June 2018
Accepted Date:	05 October 2018

Please cite this article as: Max Sjöblom, Maria Törhönen, Juho Hamari, Joseph Macey, The ingredients of Twitch streaming: Affordances of game streams, *Computers in Human Behavior* (2018), doi: 10.1016/j.chb.2018.10.012

The ingredients of Twitch streaming: Affordances of game streams

Author details:

Max Sjöblom (Corresponding author)
1) Gamification Group, Laboratory of Pervasive Computing, Tampere University of Technology
2) Gamification Group, Faculty of Communication Sciences, University of Tampere
3) Aalto University School of Science
tel: +358 50 3765703
email: max.sjoblom@tut.fi

Maria Törhönen
1) Game Research Lab, Faculty of Communication Sciences, University of Tampere, FIN-33014 University of Tampere, Finland
2) Gamification Group, Faculty of Communication Sciences, University of Tampere
tel: +358 40 5608010
email: maria.torhonen@uta.fi

Juho Hamari
1) Gamification Group, Laboratory of Pervasive Computing, UC Pori, Tampere University of Technology
2) Gamification Group, Digital Culture, UC Pori, University of Turku
3) Gamification Group, Faculty of Communication Sciences, University of Tampere
tel: +358 50 318 6861
email: juho.hamari@tut.fi

Joseph Macey
1) Game Research Lab, Faculty of Communication Sciences, University of Tampere, FIN-33014 University of Tampere, Finland
2) Gamification Group, Faculty of Communication Sciences, University of Tampere
tel: +358 40 036 6997
email: joseph.macey@uta.fi

Acknowledgements:

The research has been carried out as part of research projects (40009/16 & 40111/14) funded by the Finnish Funding Agency for Innovation (TEKES).

Disclosure statement:

No competing financial interests exist.

The ingredients of Twitch streaming: Affordances of game streams

Abstract

During the last five years, game streaming has developed from a niche market into a mainstream activity and the supply of services and technology on offer has exploded. Today, some streamers garner audiences larger than big media houses, and services such as the game streaming service Twitch host millions of daily active users. While such activity is often waived merely as a manifestation of video game culture and an extension of online behaviour by adolescents, the phenomenon has begun to generate significant revenue and has managed to shift media consumption behaviour from large commercial organisations towards content created by private individuals. However, we still have a dearth in our understanding on how streamers undertake this activity and what tools they have in their disposal to facilitate successful endeavours in streaming. As this is an activity driven by individuals, are these individuals using vastly different modalities of communication, or have common trends emerged across broadcasters, as they have in traditional media? To build a better understanding of this, we utilize the existing understanding of affordance theory, and analyse the most popular elements and practices employed by streamers in their video streams and profile pages through the investigation of the 100 most popular individual streamers on the Twitch platform. The results show new aspects of social commerce that emerges from the novel forms of online business models of individual online video streamers.

Keywords: streaming; affordances; playbour; Twitch; games; social media

Introduction

Contemporary media content producers, in the form of private individuals and small collectives, have begun competing for the attention of the audiences of many larger media conglomerates (Burling, 2015; Holland, 2016), through the utilization of digital services such as social media (Facebook, Instagram & Snapchat) and digital content sharing platforms (YouTube & Twitch) (see e.g. Grundberg & Hansegard, 2014). The increasing popularity of these content creation practices have been especially evident in video content creation, which has been spearheaded by the ease of use of video sharing platforms such as YouTube (Cha, Kwak, Rodriguez, Ahn, & Moon, 2007) and Twitch, as well as the incorporation of video as an integral part of social media platforms including Facebook and Instagram (Haimson & Tang, 2017; Raman, Tyson, & Sastry, 2018).

Video content creation has become an integrated part of everyday life for digital natives (Tempelman, 2017), in the form of pre-recorded video sharing through services such as YouTube, and live video broadcasting, or *live-streaming* on services such as Twitch, Facebook Live or YouTube Live. The term *streaming* refers to the larger cultural phenomenon of streaming as a form of social live broadcasting on Twitch (Raman et al., 2018; Törhönen, Sjöblom, & Hamari, 2018), rather than only the technological solutions of streaming video and sound data over the internet. Additionally, the content creators on Twitch are most commonly referred to as *streamers* and the content on Twitch is primarily focused on gaming and creative endeavours. Although the service is less than ten years old, Twitch caters to 15 million unique daily visitors (Twitch, 2017a), and by 2018 its monthly viewership figures have reached similar numbers as some of the larger cable TV networks in the US (Gilbert, 2018). The infrastructure of Twitch has been designed to foster high engagement between the audience and the streamer, and in order to support this type of interactivity and connectivity, Twitch allows for great freedom in the utilization of different automated bots

(e.g. chat facilitators, analytics, song requests, chat games) and tools (donation tools and trackers) in the streams, to further the appeal and communications practices of the streams.

This study will seek to answer the following research questions: *what practices and elements do individual Twitch streamers utilize in their streams* and *what affordances do these practices create for the streamers and viewers?* by observing one hundred popular streams on the social video sharing platform Twitch, and analysing the video content and the profile page of the selected streamers. This research will examine these popular practices utilized on Twitch streams, by building on existing understanding of affordance theory (Gibson, 1979; Majchrzak, Faraj, Kane, & Azad, 2013; Norman, 1988; O'Riordan, Feller, & Nagle, 2016; Treem & Leonardi, 2013) and its capabilities to analyse and understand these practices. Twitch as a service provides a unique environment for research into affordances, as the service itself provides the streamers the technology and tools for streaming, and the streamers themselves often augment the stream with their choice of additional elements and tools. Not only does this type of media service provide the content creator a way of defining their own streaming practices, it also allows for a unique setting to develop social structures through the use of these stream specific tools. Therefore, the purpose of this study is to examine if certain practices have become de-facto standards among individual streamers, or whether the field is fractured into various best practices. Furthermore, the inquiry into how these practices are reflected upon the affordances they create, help us explain the social structures between streamers and viewers.

Background

Digital media prosumption, live-streaming and Twitch

The changes in our media content consumption and production behaviour have raised the importance of the individual as a media content creator almost parallel to the traditional

corporate media production companies. This can be seen in the ever declining viewership of television (McKay, 2018; Nielsen, 2017) and in the increase in the importance of services such as YouTube (McKay, 2018) and Facebook (Joinson, 2008). The ever increasing merger of digital media consumption and production activities have broadened our understanding of such "prosumption" (Fuchs, 2014; Kotler, 2010; Ritzer, 2015; Ritzer & Jurgenson, 2010) and even changed our celebrity culture towards a more decentralized micro-celebrity (Gräve, 2017; Marwick, 2015a; Senft, 2013) and influencer culture (Abidin, 2016). This has resulted in the rapid increase of the popularity of digital content creation activities, especially exemplified by the popularity of social video content creation (e.g. streaming).

Social video content is generated by decentralized individuals, and disseminated through different commercial video sharing services such as YouTube and Twitch. This activity contains complex socio-cultural and socio-economic relationships, and although the activity itself is not new, it has been made more accessible and approachable by the developments in available technology and services. Social video content can be categorized into two types, pre-recorded video content, which is delivered through services such as YouTube, and live-broadcasted video content, also known as live-streamed content, delivered through streaming services such as Twitch.

Live-streaming or *streaming,* as a term, can refer to many aspects of digital technology and culture, ranging from purely technical data transfer, to the cultural phenomenon of streaming (Raman et al., 2018). Twitch is currently the most popular social video streaming platform in Europe and the US, providing a service for the cultural, decentralized, activity of streaming and catering to hundreds of millions of viewers (Needleman, 2015; Twitch, 2017b). Content creators on Twitch are often referred as *streamers,* and the consumers of content on Twitch will be referred to as *viewers*.

Twitch, as a service, provides an approachable platform for live-streaming, and emphasises the role of the streamer through various tools and services. The system itself allows for different levels of engagement and caters to different levels of tenure and proficiency of streamers. Twitch offers simple achievement mechanics to engage and activate the beginner streamers, but also provides the more advanced streamers tools and monetisation mechanics to maintain and further develop their activities (Perez, 2017).

Twitch offers their streamers a set structure for the stream (Recktenwald, 2017), but there are also various optional features and tools that a streamer can use to enhance the appeal and effectiveness of their stream. The main service provided by Twitch is the video stream itself, but in addition to this, Twitch offers various different features that affect the way a streamer and the audience engage with each other on the platform (Gandolfi, 2016; Karhulahti, 2016). Social features are offered, such as: the chat window; the ability to follow and share a stream or a streamer; revenue features such as the subscribe button (some revenue features require the streamer to be a part of the Twitch partner program); and informative features such as the profile page, the title of the stream and the name of the game being played.

Twitch as a platform stands out through its innovative approach to monetisation, as it also offers the streamers in their partner or affiliate programmes a share of the advertising revenue and subscriptions generated by the streamer. Variable sum donations are another approach to monetisation, offered to streamers both through third-party services, which Twitch does not get a share of, and as so-called *cheers*, which Twitch does get a revenue share of (Fontaine, 2016). By offering streamers direct revenue from their activities, the platform is acquiring more and more valuable content to offer their consumers, but also incentivizing the content creators to continue their activities (Törhönen et al., 2018). Although similar monetisation models have been provided by services such as YouTube before, Twitch

has made the prospect of tangible rewards more approachable for streamers through gamified elements and achievements. These monetisation systems, provided by Twitch, have made it possible for streamers to turn their activities into careers, which has blurred the traditional understanding of work and leisure.

This has enabled the development of a *hybrid worker*, who has transitioned their leisure activity into a professional career through the use of digital services and tools. What was once seen as a tool for a user to reflect their creativity, has now transitioned towards professionally generated user content (PGUC), particularly visible in the case of Twitch and other social video sharing platforms such as YouTube (Kim, 2012). Indeed, many users are undergoing a metamorphosis towards a more professional personal brand (Chen, 2013), with prime examples being popular YouTube and Twitch personalities PewDiePie (Grundberg & Hansegard, 2014) and Ninja (Tassi, 2018). The professionalization of content creation is increasingly blurring the lines of play and labour in these "leisure" activities, which feeds into the wider structures of the digital economy through the concepts of playbour (Kücklich, 2005; Sotamaa, 2010) and digital labour (Bermejo, 2009; Cohen, 2004; Scholz, 2012; Terranova, 2000).

Like most developing and trending phenomena, streaming has generated a growing field of research and literature, but the scope of the related research is still relatively limited to a few broader topics such as technology (Claypool, Farrington, & Muesch, 2016; Li, Salehi, & Bayoumi, 2016; Pringle, 2016; Siekkinen, Masala, & Kämäräinen, 2016), media content consumption (Hamilton, Garretson, & Kerne, 2014; Sjöblom & Hamari, 2017) and social structures (Churchill & Xu, 2016; Khan, 2017; Taylor, 2016). However, with an increasing number of streamers emerging on these dedicated streaming services, the focus of research is shifting towards the content creators. Current research has addressed the shifting relationship between the consumer and the producer of content (prosumer) (Lee & Watkins, 2016),

participatory culture (Chau, 2010; Deuze, 2006), and user generated content (Aran, Biel, & Gatica-Perez, 2014; Hamilton et al., 2014) in respect to streaming activities. Twitch as a service has been examined in previous research, with various studies examining the overall ecosystem and technical structure of Twitch (Hamilton et al., 2014; Kaytoue, Silva, & Cerf, 2012; Pires & Simon, 2015), however the tools and services of Twitch possess a different meaning to different users of Twitch (viewers and streamers), which is why it is important to evaluate the affordances of these tools through the understanding of the affordances theory.

Affordances

The affordance theory provides a way in which to interpret objects and tools in their environment and use. The theory provides various ways in which to examine the way a specific tool or object is utilized in different contexts. The term *affordance* originates from the field of visual perception, indicating the possibilities that the environment offers the animal operating in said environment (Gibson, 1979), and has since branched out into various different directions. A more modern definition sees affordances as "the design aspect of an object which suggests how the object should be used" (McGrenere & Ho, 2000, p. 1). Contemporary affordance theory also highlights clarity of information and ease of undertaking an affordance as two important concepts to understand when studying affordances as a framework for design (McGrenere & Ho, 2000).

The term has been reappropriated in the human-computer interaction (HCI) discipline, with the meaning of the term simultaneously morphing to one where the perception of the individual plays a significant role in being able to identify and interpret affordances (Norman, 1988). The examination of affordances in the context of HCI also developed the understanding of the complex nature of our communicative actions. Gaver (1991) categorised affordances of complex actions into two categories, where sequential affordances reflect the

changing nature of affordances through interaction, and nested affordances, which describes the context of affordances in relation to each other. Our understanding of affordances has therefore developed through its utilization in different disciplines of research and the use of the theory has also evolved. Some research utilizes the affordances as a static list of uses for elements, which do not change according to the need of the user (Bucher & Helmond, 2017; Gibson, 1979), whereas others use affordances as a way to analyse the uses an element may have in a changing social environment (Bucher & Helmond, 2017; Gaver, 1996; Norman, 1988; Wellman et al., 2003).

Affordances in social media research

Through its application to modern communications and technology, the theory has begun to further examine and analyse technology and its enabling effect on social and communicative actions (Gaver, 1996). This idea of *social affordances*, has been further developed in relation to social media as well as the technology that enables possibilities for communication. Social affordances have been defined as "the social structures that take shape in association to a given technical structure" (Postigo, 2016, p. 5). These social affordances emphasise the importance of the user and their environment, and can only be identified through their interaction with the user. In digital communications technology, different elements of the service are developed for a specific purpose, but further affordances, through functionality, may become associated with said elements through user interaction (Norman, 1988).

These theoretical lenses to view affordances has been frequently utilized in social media research to examine the different types of affordances that form through the use of technology and human agency (Bucher & Helmond, 2017; Leonardi, 2011). Social media, for example, has been examined in organisational use to reflect four types affordances; *Visibility* of

behaviours and information, *persistence* of communications and information, the *editability* of the communicative act, and the *association* formed between individuals, as well as content (Treem & Leonardi, 2013). A similar type of study on social media, especially social networking sites (SNS), examined another six different types of social affordances related to SNS's (O'Riordan et al., 2016). This study listed profile building, social connectivity, social interactivity, content discovery, content sharing and content aggregation as affordances of social networking sites such as Facebook. Social media affordances have also been examined in relation to communal knowledge sharing in organisations, where four additional affordances were identified (Majchrzak et al., 2013). *Meta-voicing*, where an individual adds knowledge to existing content, *triggered attending*, where an individual gets involved in an online activity or conversation through a triggered alert (e.g. notifications), *network-informed associating*, where an individual engages in the online activity aware of its relational and content ties (e.g. chats), and *generative role-taking*, where an individual takes on a community managing and sustaining role.

This study will utilize this existing understanding of the affordances of digital and social media and apply this knowledge when examining the results of this study.

Methodology

We chose to approach the collection of data in this study as a form of digital ethnography (see e.g. Murthy, 2008). The context of Twitch provides an excellent platform for ethnographic observations, as all the material observed for this study was publically available through Twitch, and no account or similar was needed to view the content.

The data for this study was gathered through the observation of one hundred different streamers on Twitch, between the 28th of April and the 9th of June 2017. The observed streamers were selected through a list of the 250 most popular streamers on the Social Blade

service (Social Blade, 2017), based on follower count. We chose to limit the data gathering to streams that fulfilled the following criteria: 1) the broadcaster was a private individual, 2) the stream was in English and 3) the streamer had been active in the past year and the video archive was freely available. To ensure that we examined decentralized individuals or groups who stream their content, we excluded popular organizational esports broadcasters such as Riot and ESL. The second criteria excluded non-English streams in order to fully understand the content of each stream that was analysed and avoid misinterpretation in observations. The third criteria arose as a result of examining certain streams that limited their video archive purely to subscribers, and thus we could not access them, as well as streamers that had not been active recently but still had a large number of followers. The details of the data gathered can be seen in Table 1. To help understand the content specific context the streamers operate in, Table 1 also includes a list of the content streamed, most commonly a specific game (such as League of Legends) or genre of stream (such as talk show or IRL).

[Insert Table 1 around here]

Commonly, in analysis of content, it is important that the content studied covers a large enough portion of the context studied, or as Barthes states "the corpus must be wide enough to give reasonable hope that its elements will saturate a complete system of resemblances and differences…" (Barthes, 1964, p. 97). Even though there are millions of streamers on Twitch, and thus, one might argue our sample of 100 streamers is not adequate to cover all aspects, we argue the opposite. This study purposefully chose to focus on popular streamers, and thus, the sample of 100 streamers that was our final sample represented the narrower focus population in a meaningful way, for example representing a number of various games and genres. Notable about the sample observed is that the majority seem to engage in streaming as an activity that is either professional or bordering on professional, based both on pure viewership numbers within the sample as well as previous knowledge on the subject that the researchers

possess. Most of our sample was also examined to engage in this activity almost daily. Among our sample, all streamers had at least 340,000 followers, and the cumulative total viewer count was on average 41,329,131 (median 23,369,305).

To study the one hundred streamers, we examined the most recent live-stream recordings from the channel specific Twitch archives (90%) or the on-going live-streams (10%). As the activity of live-streaming is global and happening on various time-zones, we were unable to examine all of the streams live, which is why we chose the most recent recording if the streamer was not live at the time of analysis. Each stream was observed for approximately 5-15 minutes. Many individual streams were between two and eight hours in length, and therefore observing recordings was invaluable for allowing us to jump to different parts in the recording, allowing for a much more effective way of finding various sequential affordances (Gaver, 1991) such as pop-up graphics.

This research only considers the additional practices that a streamer can utilize in their video stream and personal profile and therefore the basic elements and structures provided by Twitch (such as the chat window) will be excluded from this study. Both the video broadcast and the page content of the stream, available through the same URL, were analysed. All observations were made using desktop or laptop computers, and while the same exact information is visible on mobile devices, it is worth noting that while the video content is identical, the presentation of the streamer page adheres to slightly different layout standards.

The researchers, through their intimate knowledge of the activity of streaming and the Twitch platform, were able to identify commonly recurring practices among streamers, which served as the basis for performing the observations of the streams. Both researchers involved in the active phase of data collection have several years of experience from game streaming and video content creation research, and have been active Twitch viewers for over five years. In addition to a background in relevant research, one of the authors has been a professional

gamer, and the other has worked in game development for several years, helping to strengthen the understanding of gaming culture.

Results

For the profile page, every individual element was observed and recorded in a spreadsheet, with common occurrences grouped across observations of different streamers. For the video streams, all elements not explicitly part of the game being played were recorded and coded in a similar manner as the profile page elements. Commonly recurring practices and elements were identified throughout the observation process and additional, less common, elements were listed on a stream by stream basis. The most commonly occurring elements and practices, along with a description and the frequency which with they appeared in the observations, are presented separately for the video stream (Table 2) and the profile page (Table 3). Less commonly occurring elements, ones with less than five observations throughout the sample, are listed in Table 4.

[Insert Table 2 around here]

[Insert Table 3 around here]

[Insert Table 4 around here]

Discussion

From the collected data we were able to identify which elements and practices of a stream were popular among the examined streamers and how they were utilized in the streams. The practical use of the elements is relatively evident, but through the understanding of affordances, the following discussion will examine not only the elements and their practical use, but also link them to previous discussion and research on affordances and streaming. The following discussion will also take into consideration the two-way communicative

environment of Twitch, and how it affects the various affordances derived from the elements, both for a streamer and a viewer. The discussion will also introduce a new category of revenue related affordances, constructed based on the examined elements and their practical use. These types of affordances have been examined in the context of social affordances in previous research on YouTube (Postigo, 2016), but they have yet to be separately defined as such.

Social affordances of the video stream

Based on our observations, the most popular elements utilized to augment the stream, are a webcam overlay of the streamer and their vocalization delivered through a microphone. These audiovisual elements generate a two-way communicative environment for the stream and enable the streamer to narrate their gameplay to their audience. However, these elements can also set a virtual stage for the streamer and afford further profile building through the expression of the streamers personality and even self-branding (Senft, 2013). These elements may also allow the streamer to positions themselves as a public persona, or a micro-celebrity (Marwick, 2015b; Senft, 2013).

The virtual stage created by the microphone and webcam overlay afford a high level of visibility for the behaviours and knowledge of the streamer (Treem & Leonardi, 2013) as well as social connectivity and social interactivity for the streamer as well as the viewer (O'Riordan et al., 2016). Additionally these practices afford a combination of generative role-taking with meta-voicing (Majchrzak et al., 2013), which allows the streamer to take a leadership role in their stream community, but also allows the streamer to add to the knowledge and information shared within the community. Through these practices the streamer becomes the opinion leader in the community, which affirms their influence on their community and viewers. This influence is evident in the development of influencer culture (Abidin & Ots, 2015) and micro-celebrities (Khamis, Ang, & Welling, 2017; Marwick,

2015b; Senft, 2013) but also in the controversies and reactions to extreme behaviours related to streamers and streaming (Alexander, 2018; Hall, 2014).

Revenue affordances of the video stream

Through our analysis of the popular practices utilized by Twitch streamers, we were able to identify a new category of affordances, *revenue affordances*, which was divided into two subcategories. The category of revenue affordances highlights the practices that afford direct revenue in relation to specific behaviours and interactions within the stream.

The importance of visible and interactive revenue and monetisation techniques in content creation has become more relevant in recent years, with the growth of content creator culture. Twitch enables the content creator to utilize two main viewer driven monetisation services within the stream, subscriptions and donations. In addition to this we observed various additional ways that these elements were highlighted and interacted with within the streams, as well as additional monetisation instruments such as sponsorship banners. Therefore, we categorise the revenue affordances into two subcategories: *social revenue* and *commercial revenue*, which are described in Table 5.

[Insert Table 5 around here]

A significant practice present in many streams is acknowledging the subscribers and donors of the stream. Streaming is a form of content creation that relies very heavily on the viewers, due to the real time nature of said media and the importance of community (Sjöblom & Hamari, 2017). Thus, it is no great surprise that, as with any type of media, content producers want to keep their audience engaged in order to increase the potential for generating revenue.

One such way is through the *social revenue affordances* related to elements that acknowledge and celebrate subscribers and donors, in order to encourage further purchasing behaviour in the community through social pressure, togetherness or even competition. In

fact, previous research has highlighted the importance of social motivations not only for consuming streamed content, but also for choosing to pay for subscriptions (Hilvert-Bruce, Neill, Sjöblom, & Hamari, 2018; Sjöblom & Hamari, 2017). Therefore, it is in the interest of the content creator to further facilitate the fulfilment of these spectating motivations.

The acknowledgement of subscribers and donators manifests itself through multiple different practices. The first practice that clearly affords social revenue generation, are the static listings of latest subscribers, latest donors or top donors. The second, and slightly more popular, practice are the dynamic notifications that pop up during the video, commonly accompanied by audio, animation or a reaction from the streamer. These notifications provide the stream community the ability to applaud new supporters of the stream, a behaviour that is commonly witnessed in video streams (Hamilton et al., 2014). An extreme, but interesting, example of social revenue affordances of these stream practices is the way competitive donating to streamers has become a popular activity among some viewers. During our analysis we witnessed a few occasions where two or more spectators engaged in a "donation war" (see e.g. KittyPlays, 2016), with one person continually raising the donation of the other person, in an effort to end up as the top daily or monthly donor. In some cases, the individuals may also be encouraged by the streamer or the chat community, or both. In the light of this activity, it can be argued that these notifications and pop-ups are also social in nature and also afford triggered attending.

Our observations also revealed that any elements superimposed on the game graphics have the potential to hide critical UI elements of the game being played, and as such, any visual elements placed on the video stream should be considered meaningful and important for the aims of the streamer. Analysis of the affordances of these elements and practices highlights the revenue generation possibilities present in the activity, which is why this analysis of affordances brings forth important information not only for the streamer

themselves, but also for game designers and commercial entities working with streamers through for example sponsorships.

Social affordances of the personal profile

The standard setup offered by Twitch for streamers features not only the primary video stream, but also a personalised profile visible underneath the video stream. As this space is freely customizable by the streamer without additional technical tools, it was also where we were able to detect most diversity between streamers.

An inherently social element in streaming is the use of social media. Although the use of this element within the stream is relatively unpopular, it is the most common element in the profile of a streamer and has a significant meaning in the activity of streaming. Social media links are promotional in their nature, but within this activity, they also enable further community building by affording social connectivity, social interactivity, and further content discovery (O'Riordan et al., 2016). The importance of community and community building within the streaming culture is significant and emphasised by the content creators themselves, as the community feeds the attention economy (Simon, 1971) that utilizes the community and audiences as a commodity for commercial gain. Social media also provides a streamer with the possibility to further their personal brand (O'Riordan et al., 2016) and create a multi-channel presence. By promoting social media within their profile, a streamer may be able to generate a wider presence and also a more active community that stretches outside the confines of merely the Twitch platform. Additionally, the social media outlets can be used to generate triggered attending (Majchrzak et al., 2013), by promoting when the streamer starts broadcasting, a common practice on Twitter.

From our observations we discovered that, although the primary function of the personalised profile should be to provide more information about the streamer, only around half of the observed streamers have included an "about me" section in their profile. This type

of personal description provides an opportunity for a streamer to become more approachable and easier to identify with. A description like this also affords profile building (O'Riordan et al., 2016), through which a streamer can enhance the personal brand they convey through their video stream and build upon it.

Although only half of the examined streamers did not include a clear description about themselves, it was discovered that over half of the examined streamers have a specification of the tools and technology they use to stream. This type of information is often requested by viewers and may act as a status indicator for streamers and game enthusiasts, utilised to indicate a certain level of expert knowledge and understanding of gaming or streaming. The display and mention of particular hardware manufacturers can also be considered an indirect sponsorship or advertising effort.

The profile page of a streamer is also used to highlight the structure of the stream through elements such as the rules and schedule of the stream. Although our observations indicated that these elements are not very popular among streamers, they do afford generative role-taking (Majchrzak et al., 2013) for the content creator, where they can generate the structure of the stream and their community, as well as triggered attending through the utilization of a schedule. Similarly to social media links, we identify that these elements also afford community building and community aspects for the content creator

Although a schedule may restrict the free nature of streaming, it also allows for more consistency. A schedule also provides a familiar setting for viewers, familiarised from traditional television broadcasting (Smith, Obrist, & Wright, 2013), and may encourage habitual consumption of stream content. The rules of a stream provide structure by simultaneously limiting and encouraging certain types of behaviour. These rules most often regulate the viewer's behaviour in the chat and although they may make the chat more comfortable for some viewers, others may prefer a more disruptive style of chat. This seems

to also fluctuate based on the game and stream genre (Sjöblom, Törhönen, Hamari, & Macey, 2017).

Revenue affordances of the personal profile

Elements that afford revenue generation were also prominent and popular elements in the personal profile of a streamer. There were clear examples of practices that afforded both social revenue and commercial revenue. Indeed, the donation button was commonly the first element in the profile page of a streamer. By placing this element in a prominent position as a clear call-for-action, it has an increased ability to drive viewer engagement, leading to increased revenue for the streamer. Along with the call-for-action, these elements often listed benefits for subscription and donation, potentially as a further way to incentivize engagement. Some streamers listed the donation obligations they had towards the viewers, as a way of expectation management, which also affords role-taking and meta-voicing (Majchrzak et al., 2013) through interaction. There have been several cases indicating unrealistic expectations of viewers regarding the reciprocity of streamers related to donations (D'Anastasio, 2017). Interestingly we also observed some streamers deliberately downplaying the aspect of donating, stating that the option was there because many viewers had asked for it, thus expressing that they are not "money hungry". Compared to the other forms of social revenue affordances discussed previously, these elements and practices were in comparison more static, as they did not change as rapidly as the dynamic in-stream elements.

Another popular element of the profile page was sponsorships and advertising of external partners, with many streamers having multiple image banners linking to external web pages and online stores. These afford direct commercial revenue generation, where the content creation aims to directly drive their viewers towards a third-party purchase, which is analogous to sponsorship advertising in traditional television broadcasts. A variety of industries are represented within the sponsor banners, with the most common being

manufacturers of computer hardware and gaming equipment, online gaming related services, media services and beverages.

Related to sponsorships, but not entirely equivalent, is the advertisement of merchandise related to the content creator. This type of merchandise affords the content creator the ability to further their personal brand as a streamer (O'Riordan et al., 2016), but is also provided by Twitch as a possible revenue stream (Twitch, 2017c). Although these adverts afford direct revenue generation, in this socio-economic context, the revenue generation may even be secondary to the content creator, as the element of brand building, community involvement and fandom are heavily emphasised in the interaction with this element.

As mentioned in the context of the video stream, acknowledging viewer support appears to be an integral part of streaming, and an element that can also be observed in some streamer profiles is a list of top donors, a form of high-score list or badges commonly used in gamification (Hamari, 2013, 2017; Hamari, Koivisto, & Sarsa, 2014; Morschheuser, Hamari, Koivisto, & Maedche, 2017). These lists serve as a way of acknowledging those who have given the largest amount of monetary support for the streamer, potentially encouraging others to also donate to the streamer, as discussed in relation to the revenue affordances of the stream. These affordances, along with subscriber icons, also tie to loyalty marketing where top customers and loyal supporters are visually celebrated in order to induce social influence (Cialdini, 2001; Festinger, 1954) and social proof (Goldstein, Cialdini, & Griskevicius, 2008).

Practical implications

The results of our study offer many interesting insights into the world of streaming, which can be put into good use by both practitioners themselves and managerial staff working

in industries related to streaming (such as game development, influencer marketing and media).

For streamers themselves, our study offers an excellent overview of the type of practices & elements used, that a streamer can use to benchmark their own stream content against other successful streamers, and potential figure out areas of improvement. Furthermore, identifying less commonly used practices may allow streamers the opportunity to stand out from the continuously increasing crowd that is contemporary live-streaming.

For practitioners within the industry of media & communications, the indication that individual actors gravitate towards commonly shared practices and elements helps further the understanding of contemporary media services where the content creation is driven by the users. While not all practices presented here will be applicable in other contexts, these practices may still serve as inspiration and a base when designing new services utilizing one-to-many and many-to-many broadcasting & live video.

For the game design industry in particular, we emphasise the importance of planning the UI and screen layout with streaming & video creation in mind. An interface that is already cluttered with elements leave next to no space for the expressive creative freedom of streamers, thus meaning that any graphical elements superimposed on the game will block out critical game elements. Hence, it is worth considering if an adequate amount of space can be left for custom elements, and perhaps even integrate some options for these in the game itself.

Finally, for streaming services themselves, it might be advisable to further integrate some of these common practices & elements into the service itself. As we can see, particularly among popular streamers, certain elements such as the regular schedule could be easily implemented into the user interface of the service itself, helping communicate important information to viewers. We have noticed that over the past few years, services such

as Twitch have continuously focused on improving these basic practices and offer many common affordances as part of the base service.

Limitations and future research

When utilizing the affordance theory, it should be noted that affordances are very rarely static and they are relational to the both the temporal and the social context as well as the environment in which they are utilized and examined (Gaver, 1991). There are also many ways in which the affordances theory has been utilizes and debate about the different ways in which it should be understood.

This study concentrated on the most popular streams on Twitch and observed a single streaming session from a streamer's archive of content. Therefore, it is not representative of all streams and is limited to a single occurrence. As the study did not examine the full content of the streams, there may be some elements missing from the observations that are only occasionally visible in the streams, and thus a type of sequential affordances. These elements were mainly notifications such as the new donation and new subscription pop-ups.

The study exclusively examined English speaking streams, which may limit it to a certain cultural context. The male dominant set of streamers observed in this study also limits the female representation in this study. However, it should be noted that streaming as a phenomenon, and game streams in particular, is still a relatively male dominant activity (Sjöblom & Hamari, 2017).

The findings of this research open up various different opportunities for future research. This research could be expanded by including different research methods, such as interviews or surveys with streamers. These methods could further define our findings and also enable us to take this research further by examining what specific combinations of affordances are most used by popular streamers, as well as investigating motivations and gratifications for use

among streamers. This research could also be expanded by redoing the observations on a randomised set of streamers, to gain an insight to which affordances an average streamer utilises.

Conclusions

This study investigated how streamers on the Twitch platform construct the structure of the content that they produce, through an affordances approach. This investigation was done through one hundred observations of the most popular Twitch streamers, by number of followers. We identified a number of affordances that Twitch streamers use to enhance their streams and provide an experience that is both enticing for viewers and generates revenue for the streamer. Affordances were identified separately for the video stream and the profile page of the streamer.

We found that while some elements, including the use of a microphone and webcam along with integration of other social media channels, seem to form a ubiquitous base for the activity of streaming, there are a number of other very varied affordances that are used alongside these. These base affordances, all categorized as social affordances, would support previous research indicating that the activity of streaming, from the consumer side, is indeed highly based on social interaction (Hamilton et al., 2014; Sjöblom & Hamari, 2017; Sjöblom et al., 2017).

Contemporary research among affordances has focused a great deal on the aspect of mobility in the modern world (Ranzini & Lutz, 2017; Schrock, 2015). Reflecting upon this, it is interesting to see that our results do not indicate any affordances that would be significantly different for spectators on a mobile platform compared to watching from a computer. Twitch offers a dedicated app on most major mobile platforms, and thus the possibility of watching

Twitch on the go is a very real one. Thus, we can state that using Twitch is more of a universal experience, not limited to the platform in use, at least from the consumer side.

This study is not only limited to Twitch and video game streaming, but also helps us understand the nature of affordances in the modern social media driven world. Indeed, the new type of creator focused economies that have appeared around services such as Twitch and YouTube are testaments to the need of understanding the interactions going on between producers and consumers of the modern internet era. In fact, the affordances that streamers facilitate, as uncovered in this study, help us understand these interactions, and also highlight the difference a particular element or practice can have for different stakeholder groups. The identification of different types of revenue affordances tied to separate revenue streams also carries over to other types of content creation and social media outside of Twitch, and strengthens our knowledge on influencer and micro-celebrity culture (Senft, 2013).

References

Abidin, C. (2016). "Aren't These Just Young, Rich Women Doing Vain Things Online?": Influencer Selfies as Subversive Frivolity. *Social Media and Society*, *2*(2). https://doi.org/10.1177/2056305116641342

Abidin, C., & Ots, M. (2015). The Influencer's dilemma: The shaping of new brand professions between credibility and commerce. *"Media Branding Revised: Participative Audiences and Their Consequences for Media Branding*, 1–12.

Alexander, J. (2018). Twitch tackling sexually suggestive content in IRL section with new rules. Retrieved June 29, 2018, from https://www.polygon.com/2018/2/8/16988696/twitch-irl-rules-sexual-content-streamers-moderation-bans

Aran, O., Biel, J. I., & Gatica-Perez, D. (2014). Broadcasting Oneself: Visual discovery of vlogging styles. *IEEE Transactions on Multimedia*, *16*(1), 201–215. https://doi.org/10.1109/TMM.2013.2284893

Barthes, R. (1964). *Elements of Semiology*. New York, NY: Hill and Wang.

Bermejo, F. (2009). Audience manufacture in historical perspective: From broadcasting to Google. *New Media and Society*, *11*(1–2), 133–154. https://doi.org/10.1177/1461444808099579

Bucher, T., & Helmond, A. (2017). The affordances of social media platforms. In J. Burgess, A. Marwick, & T. Poell (Eds.), *The SAGE Handbook of Social Media* (pp. 233–253). Thousand Oaks, CA: Sage Publications.

Burling, A. (2015). Book Publishing Comes to YouTube. *Publisher's Weekly*, pp. 22–26.

Cha, M., Kwak, H., Rodriguez, P., Ahn, Y., & Moon, S. (2007). I Tube , You Tube , Everybody Tubes : Analyzing the World ' s Largest User Generated Content Video System. *IMC'07, October 24-26, San Diego, California, USA*, 1–13.

https://doi.org/10.1145/1298306.1298309

Chau, C. (2010). YouTube as a participatory culture. *New Directions for Youth Development*, *2010*(128), 65–74. https://doi.org/10.1002/yd.376

Chen, C. P. (2013). Exploring Personal Branding on YouTube. *Journal of Internet Commerce*, *12*(4), 332–347. https://doi.org/10.1080/15332861.2013.859041

Churchill, B. C. B., & Xu, W. (2016). The modem nation: A first study on Twitch.TV social structure and player/game relationships. In *Proceedings - 2016 IEEE International Conferences on Big Data and Cloud Computing, BDCloud 2016, Social Computing and Networking, SocialCom 2016 and Sustainable Computing and Communications, SustainCom 2016* (pp. 223–228). https://doi.org/10.1109/BDCloud-SocialCom-SustainCom.2016.43

Cialdini, R. B. (2001). Influence: Science and Practice. *Book*, *3rd*, 262. https://doi.org/10.2307/3151490

Claypool, M., Farrington, D., & Muesch, N. (2016). Measurement-based analysis of the video characteristics of Twitch.tv. In *2015 IEEE Games Entertainment Media Conference, GEM 2015*. https://doi.org/10.1109/GEM.2015.7377227

Cohen, N. S. (2004). The Valorization of Surveillance: Towards a Political Economy of Facebook. https://doi.org/Article

D'Anastasio, C. (2017). When Fans Take Their Love For Twitch Streamers Too Far. Retrieved June 15, 2017, from http://kotaku.com/when-fans-take-their-love-for-twitch-streamers-too-far-1794815112

Deuze, M. (2006). Ethnic media, community media and participatory culture. *Journalism*, *7*(3), 262–280. https://doi.org/10.1177/1464884906065512

Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations*, *7*(2), 117–140. https://doi.org/10.1177/001872675400700202

Fontaine, R. (2016). Introducing Cheering: Celebrate, together. Retrieved June 29, 2018, from https://blog.twitch.tv/introducing-cheering-celebrate-together-da62af41fac6

Fuchs, C. (2014). Digital prosumption labour on social media in the context of the capitalist regime of time. *Time & Society*, *23*(1), 97–123. https://doi.org/10.1177/0961463X13502117

Gandolfi, E. (2016). To watch or to play, it is in the game: The game culture on Twitch.tv among performers, plays and audiences. *Journal of Gaming & Virtual Worlds*, *8*(1), 63–82. https://doi.org/10.1386/jgvw.8.1.63_1

Gaver, W. W. (1991). Technology affordances. In *Proceedings of the SIGCHI conference on Human factors in computing systems Reaching through technology - CHI '91* (pp. 79–84). https://doi.org/10.1145/108844.108856

Gaver, W. W. (1996). Situating Action II: Affordances for Interaction - The Social is Material for Design. *Ecological Psychology*, *8*(2), 111–129. https://doi.org/10.1207/s15326969eco0802_2

Gibson, J. J. (1979). The Ecological Approach to Visual Perception. *Houghton Mifflin-Boston*.

Gilbert, B. (2018). Amazon's streaming service Twitch is pulling in as many viewers as CNN and MSNBC. Retrieved May 1, 2018, from http://nordic.businessinsider.com/twitch-is-bigger-than-cnn-msnbc-2018-2?r=US&IR=T

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research*, *35*(3), 472–482. https://doi.org/10.1086/586910

Gräve, J.-F. (2017). Exploring the Perception of Influencers Vs. Traditional Celebrities. In *Proceedings of the 8th International Conference on Social Media & Society - #SMSociety17* (Vol. 28, pp. 1–5). https://doi.org/10.1145/3097286.3097322

Grundberg, S., & Hansegard, J. (2014). YouTube's Biggest Draw Plays Games, Earns $4 Million a Year. Retrieved June 2, 2017, from https://www.wsj.com/articles/youtube-star-plays-videogames-earns-4-million-a-year-1402939896

Haimson, O. L., & Tang, J. C. (2017). What Makes Live Events Engaging on Facebook Live, Periscope, and Snapchat. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17* (pp. 48–60). https://doi.org/10.1145/3025453.3025642

Hall, C. (2014). Twitch cracks down on topless and "sexually suggestive" streamers. Retrieved June 14, 2017, from https://www.polygon.com/2014/10/27/7079631/twitch-topless-ban-code-sexually-suggestive

Hamari, J. (2013). Transforming homo economicus into homo ludens: A field experiment on gamification in a utilitarian peer-to-peer trading service. *Electronic Commerce Research and Applications*, *12*(4), 236–245. https://doi.org/10.1016/j.elerap.2013.01.004

Hamari, J. (2017). Do badges increase user activity? A field experiment on the effects of gamification. *Computers in Human Behavior*, *71*, 469–478. https://doi.org/10.1016/j.chb.2015.03.036

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? - A literature review of empirical studies on gamification. In *Proceedings of the Annual Hawaii International Conference on System Sciences* (pp. 3025–3034). https://doi.org/10.1109/HICSS.2014.377

Hamilton, W. A., Garretson, O., & Kerne, A. (2014). Streaming on twitch: fostering participatory communities of play within live mixed media. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 1315–1324. https://doi.org/10.1145/2556288.2557048

Hilvert-Bruce, Z., Neill, J. T., Sjöblom, M., & Hamari, J. (2018). Social motivations of live-streaming viewer engagement on Twitch. *Computers in Human Behavior*, *84*, 58–67.

https://doi.org/10.1016/j.chb.2018.02.013

Holland, M. (2016). How YouTube Developed into a Successful Platform for User-Generated Content. *Elon Journal*, *7*(1), 52–69.

Joinson, a. N. (2008). 'Looking at', 'looking up' or 'keeping up with' people? Motives and uses of Facebook. *CHI 2008 Proceedings: Online Social Networks*, 1027–1036. https://doi.org/978-1-60558-01101/08/04

Karhulahti, V. (2016). Prank , Troll , Gross and Gore : Performance Issues in Esport Live-Streaming. *1st International Joint Conference of DiGRA and FDG*, 1–13.

Kaytoue, M., Silva, A., & Cerf, L. (2012). Watch me playing, i am a professional: a first study on video game live streaming. *Proceedings of the 21st International Conference Companion on World Wide Web*, 1181–1188. https://doi.org/10.1145/2187980.2188259

Khamis, S., Ang, L., & Welling, R. (2017). Self-branding, 'micro-celebrity' and the rise of Social Media Influencers. *Celebrity Studies*, *8*(2), 191–208. https://doi.org/10.1080/19392397.2016.1218292

Khan, M. L. (2017). Social media engagement: What motivates user participation and consumption on YouTube? *Computers in Human Behavior*, *66*, 236–247. https://doi.org/10.1016/j.chb.2016.09.024

Kim, J. (2012). The institutionalization of youtube: From user-generated content to professionally generated content. *Media, Culture and Society*, *34*(1), 53–67. https://doi.org/10.1177/0163443711427199

KittyPlays. (2016). Biggest Twitch donation war ever!!! Retrieved June 19, 2018, from https://www.youtube.com/watch?v=s1Bec5KkqOE

Kotler, P. (2010). The Prosumer Movement. In *Prosumer Revisited SE - 2* (pp. 51–60). https://doi.org/10.1007/978-3-531-91998-0_2

Kücklich, J. (2005). Precarious Playbour : Modders and the Digital Games. *Fibreculture*, (5),

1–8. https://doi.org/10.1016/B978-0-7506-7523-9.50022-2

Lee, J. E., & Watkins, B. (2016). YouTube vloggers' influence on consumer luxury brand perceptions and intentions. *Journal of Business Research*, *69*(12), 5753–5760. https://doi.org/10.1016/j.jbusres.2016.04.171

Leonardi. (2011). When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies. *MIS Quarterly*, *35*(1), 147. https://doi.org/10.2307/23043493

Li, X., Salehi, M. A., & Bayoumi, M. (2016). VLSC: Video Live Streaming Using Cloud Services. *2016 IEEE International Conferences on Big Data and Cloud Computing (BDCloud), Social Computing and Networking (SocialCom), Sustainable Computing and Communications (SustainCom) (BDCloud-SocialCom-SustainCom)*, 595–600. https://doi.org/10.1109/BDCloud-SocialCom-SustainCom.2016.93

Majchrzak, A., Faraj, S., Kane, G. C., & Azad, B. (2013). The contradictory influence of social media affordances on online communal knowledge sharing. *Journal of Computer-Mediated Communication*, *19*(1), 38–55. https://doi.org/10.1111/jcc4.12030

Marwick, A. E. (2015a). Instafame: Luxury Selfies in the Attention Economy. *Public Culture*, *27*(1 75), 137–160. https://doi.org/10.1215/08992363-2798379

Marwick, A. E. (2015b). You May Know Me from YouTube: (Micro-)Celebrity in Social Media. In *in A Companion to Celebrity* (pp. 100–127). https://doi.org/10.1002/9781118475089

McGrenere, J., & Ho, W. (2000). Affordances : Clarifying and Evolving a Concept. In *Graphics Interface* (pp. 1–8). https://doi.org/citeulike-article-id:2863397

McKay, B. (2018). The Future Of Media Buying: YouTube Versus Traditional TV. Retrieved May 2, 2018, from https://www.forbes.com/sites/forbesagencycouncil/2018/01/16/the-future-of-media-buying-youtube-versus-traditional-tv/#3b93e4a22675

Morschheuser, B., Hamari, J., Koivisto, J., & Maedche, A. (2017). Gamified crowdsourcing: Conceptualization, literature review, and future agenda. *International Journal of Human Computer Studies*, *106*, 26–43. https://doi.org/10.1016/j.ijhcs.2017.04.005

Murthy, D. (2008). Digital Ethnography: An Examination of the Use of New Technologies for Social Research. *Sociology*, *42*(5), 837–855. https://doi.org/http://dx.doi.org/10.1177/0038038508094565

Needleman, S. E. (2015). Twitch's Viewers Reach 100 Million a Month. Retrieved June 2, 2017, from https://blogs.wsj.com/digits/2015/01/29/twitchs-viewers-reach-100-million-a-month/

Nielsen. (2017). *The Nielsen Total Audience Report*.

Norman, D. A. (1988). The Psychology of Everyday Things. *The Psychology of Everyday Things*, 1–104. https://doi.org/10.2307/1423268

O'Riordan, S., Feller, J., & Nagle, T. (2016). A categorisation framework for a feature-level analysis of social network sites. *Journal of Decision Systems*, *25*(3), 244–262. https://doi.org/10.1080/12460125.2016.1187548

Perez, S. (2017). Twitch launches Achievements and Stream Summary to help creators grow their channels. Retrieved June 19, 2018, from https://techcrunch.com/2017/11/14/twitchs-launches-achievements-and-stream-summaries-to-help-creators-grow-their-channels/

Pires, K., & Simon, G. (2015). YouTube Live and Twitch : A Tour of User-Generated Live Streaming Systems. *MMSys DataSet*, 1–6. https://doi.org/10.1145/2713168.2713195

Postigo, H. (2016). The socio-technical architecture of digital labor: Converting play into YouTube money. *New Media and Society*, *18*(2), 332–349. https://doi.org/10.1177/1461444814541527

Pringle, R. (2016). Periscope's Paradox: The promise and peril of uncensored live video.

IEEE Consumer Electronics Magazine, *5*(4), 101–102. https://doi.org/10.1109/MCE.2016.2590582

Raman, A., Tyson, G., & Sastry, N. (2018). Facebook (A)Live? Are live social broadcasts really broadcasts? In *Proceedings of the 2018 World Wide Web Conference* (pp. 1491–1500). Lyon: International World Wide Web Conferences Steering Committee. https://doi.org/10.1145/3178876.3186061

Ranzini, G., & Lutz, C. (2017). Love at first swipe? Explaining Tinder self-presentation and motives. *Mobile Media and Communication*, *5*(1), 80–101. https://doi.org/10.1177/2050157916664559

Recktenwald, D. (2017). Toward a transcription and analysis of live streaming on Twitch. *Journal of Pragmatics*, *115*, 68–81. https://doi.org/10.1016/j.pragma.2017.01.013

Ritzer, G. (2015). Prosumer Capitalism. *Sociological Quarterly*, *56*(3), 413–445. https://doi.org/10.1111/tsq.12105

Ritzer, G., & Jurgenson, N. (2010). Production, Consumption, Prosumption: The nature of capitalism in the age of the digital "prosumer." *Journal of Consumer Culture*, *10*(1), 13–36. https://doi.org/10.1177/1469540509354673

Scholz, T. (2012). *Digital labor: The internet as playground and factory*. *Digital Labor: The Internet as Playground and Factory*. https://doi.org/10.4324/9780203145791

Schrock, A. R. (2015). Communicative affordances of mobile media: Portability, availability, locatability, and multimediality. *International Journal of Communication*, *9*(1), 1229–1246. https://doi.org/10.1177/0094306111425016k

Senft, T. M. (2013). Microcelebrity and the Branded Self. In *A Companion to New Media Dynamics* (pp. 346–354). https://doi.org/10.1002/9781118321607.ch22

Siekkinen, M., Masala, E., & Kämäräinen, T. (2016). A First Look at Quality of Mobile Live Streaming Experience: the Case of Periscope. https://doi.org/10.1145/2987443.2987472

Simon, H. A. (1971). Designing organizations for an information-rich world. *Computers, Communications, and the Public Interest*, *72*, 37. https://doi.org/citeulike-article-id:986786

Sjöblom, M., & Hamari, J. (2017). Why do people watch others play video games? An empirical study on the motivations of Twitch users. *Computers in Human Behavior*, *75*, 985–996. https://doi.org/10.1016/j.chb.2016.10.019

Sjöblom, M., Törhönen, M., Hamari, J., & Macey, J. (2017). Content structure is king: An empirical study on gratifications, game genres and content type on Twitch. *Computers in Human Behavior*, *73*, 161–171. https://doi.org/10.1016/j.chb.2017.03.036

Smith, T., Obrist, M., & Wright, P. (2013). Live-streaming changes the (video) game. In *Proceedings of the 11th european conference on Interactive TV and video - EuroITV '13* (p. 131). https://doi.org/10.1145/2465958.2465971

Social Blade. (2017). Track Twitch analytics, future predictions & Twitch usage graphs. Retrieved May 4, 2017, from https://socialblade.com/twitch/

Sotamaa, O. (2010). When the game is not enough: Motivations and practices among computer game modding culture. *Games and Culture*, *5*(3), 239–255. https://doi.org/10.1177/1555412009359765

Tassi, P. (2018). Ninja's New "Fortnite" Twitch Records: 5 Million Followers, 250,000 Subs, $875,000+ A Month. Retrieved April 27, 2018, from https://www.forbes.com/sites/insertcoin/2018/04/07/ninjas-new-fortnite-twitch-records-5-million-followers-250000-subs-875000-a-month/#5c5a45b1478f

Taylor, N. T. (2016). Now you're playing with audience power: the work of watching games. *Critical Studies in Media Communication*, *33*(4), 293–307. https://doi.org/10.1080/15295036.2016.1215481

Tempelman, M. (2017). 17 Stats And Facts Every Marketer Should Know About Video

Marketing. *Forbes*.

Terranova, T. (2000). Free Labor: PRODUCING CULTURE FOR THE DIGITAL ECONOMY. *Social Text*, *18*(2 63), 33–58. https://doi.org/10.1215/01642472-18-2_63-33

Törhönen, M., Sjöblom, M., & Hamari, J. (2018). Likes and views: investigating internet video content creators perceptions of popularity. In *Proceedings of GamiFIN 2018*. Pori, Finland.

Treem, J. W., & Leonardi, P. M. (2013). Social Media Use in Organizations: Exploring the Affordances of Visibility, Editability, Persistence, and Association. *Annals of the International Communication Association*, *36*(1), 143–189. https://doi.org/10.1080/23808985.2013.11679130

Twitch. (2017a). About Twitch. Retrieved June 8, 2017, from https://www.twitch.tv/p/about

Twitch. (2017b). Twitch 2017 year in review. Retrieved June 29, 2018, from https://www.twitch.tv/year/2017/

Twitch. (2017c). Twitch Partner Teespring Merchandise Store Guide. Retrieved June 13, 2017, from https://help.twitch.tv/customer/en/portal/articles/1766516-twitch-partner-teespring-merchandise-store-guide

Wellman, B., Quan-Haase, A., Boase, J., Chen, W., Hampton, K., Díaz, I., & Miyata, K. (2003). The social affordances of the Internet for networked individualism. *Journal of Computer-Mediated Communication*, *8*(1).

Table 1 Data

Variable		N	Variable		N
Total number of streams investigated		179	Gender	Female	11
	Valid	100		Male	85
	Non-English	28		Female and Male (streaming as group)	4
	Organization as broadcaster	22			
	Archive unavailable or non-active streamer	29			
Content type	League of Legends	24			
	Player Unknown Battlegrounds	12			
	Counter-Strike: Global Offensive	10			
	Several games played	10			
	Hearthstone	9			
	FIFA 17	4			
	Talk show	3			
	Grand Theft Auto	3			
	Minecraft	3			
	H1Z1	2			
	Overwatch	2			
	IRL stream	2			
	Games with one appearance each	16			

Table 2. Observations for video stream elements and practices

Element	Description of practical use	Frequency (% elements present)
Microphone	A microphone allows a streamer to add additional voiceover and narration to their stream.	100
Webcam	A webcam provides an additional video element to the stream. Most often a webcam shows the streamer in a setting they have chosen, in game streams it is usually the secondary visual on top of the game.	86
Subscriber notification	A notification pop-up that is shown on top of the video stream when a new subscription comes in. This normally shows a celebratory message, along with the name of the subscriber.	45
Donation notification	Similar to subscriber notification, commonly shows the name of the donor and the amount of the donation.	42
Sponsor banner	Sponsor banners are advertisement banners placed on top of the video stream. These placements are not set and differ among streamers. Can be static or rotating among different sponsors.	39
Latest subscriber(s)	Normally a small visual element on the screen that shows the latest subscriber's name and optionally how long they subscribed for. Placement and visual design of this element is not set, and differs among streamers.	36
Top donator	A visual element that shows the top donator of the stream overall or for the current broadcast.	31
Latest donor(s)	Similar visual element to latest subscriber, but shows the latest donation, normally the name of the donor and the amount that was donated.	26
Music (non-game)	Additional music chosen by the streamer.	25
Social media banner	These banners advertise social media accounts of the streamer and are placed in different locations on top of the video stream depending on the streamer.	25

Table 3. Observations for profile page elements and practices

Element	Description of practical use	Frequency (% elements present)
Social media links	Links for different social media accounts for the streamer	100
Donation link	Donation links are placed in the profile of the streamer and allow viewers to donate money to the streamer.	89
Sponsor links	Sponsorships are visible in the profile of the streamer, where they are normally accompanied by a call for action and a direct link to specific products or services.	80
Subscription link	A visual element that links to the subscription page of the channel. Commonly accompanied by descriptions of the benefits users get when subscribing.	59
Machine specifications	Machine specifications that describe the specific technology and tools the streamer uses in their activities.	56
FAQ / about me	The FAQ/about me section enables a personalised description of the profile.	53
Merchandise link	Merchandise links direct the viewer to a merchandise store where they can purchase branded merchandise.	35
Rules	Rules define the code of conduct of the video stream. These are normally defined by the streamer and especially regulate the way viewers interact with each other and the streamer in the video stream chat.	31
Top donors list	Top donor list highlights the highest donations made by viewers. This lists the highest accumulated donations made by specific viewers.	24
Schedule	The schedule of the streamer, that states when they normally broadcast.	17

Table 4. Additional elements encountered during analysis

Additional Elements in video stream	Additional Elements in profile
Loyal point bot	"Why subscribe" section
Twitch status feed	Goals
Event promo	Achievements
"Now playing" music	Contact information
	Subscriber info
	Subscriber emote images
	Medical marijuana ad
	Subscriber perks list
	List of money raised for charity
	PO box address
	In-stream virtual currency (e.g. Swiftbucks)
	Link to Patreon page of streamer
	Designer responsible for graphic design
	Link to personal website
	Links to charities
	Links to music playlists
	Links to giveaways & raffles

Table 5. Revenue affordances

Main category	Subcategory	Description	Example
Revenue affordances	Social revenue	Monetisation through increased social visibility and competitive elements	Top donor lists, pop-up notifications, subscription and donation links
	Commercial revenue	Monetisation through traditional product placement or advertising	Advertising and sponsorships

- This study identifies practices & elements used by the most popular Twitch streamers
- Results indicate a convergence of various broadcasting practices among practitioners
- Supports previous streaming studies and indicates social affordances as highly important
- Revenue affordances are identified as an important branch of affordances in social media