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RESEARCH PAPER

# Game-swinging on Twitch: an affordances perspective

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**Abstract**
Live-streaming is now a popular form of new media as well as an important driver of E-Commerce. Nowhere is this seen more than in video-game streaming on Twitch. Streaming platforms like Twitch now provide specific affordances specifically designed to promote and facilitate videogame-streaming. Developers too provide their own game-based affordances to encourage the streaming of their games. However, despite the popularity of Twitch with viewers and game developers, this dichotomy of platform- and game-based streaming affordances has received little attention. This study helps to fill this gap in the literature by exploring the factors that drive streamers use of both platform and videogame affordances as they create streaming content. The study uses empirical data on 5,656 Twitch streamers ($n = 5{,}656$) to examine how platform affordances are combined with those available in games through a process we call "game-swinging". Key results of the study show that platform-based affordances lend themselves well to game-swinging behaviours, while videogame-based affordances may be difficult for streamers to utilize without specific emphasis on streaming a single-game. These and other findings yield a deeper understanding of the processes that drive live-streaming content creation across a variety of e-Commerce platforms.

**Keywords** Twitch · Live-streaming · Game-swinging · Polymedia · Affordances

**JEL Classification** O33

## Introduction

Live-streaming represents an emerging category of media with important implications for electronic commerce (Sjöblom & Hamari, 2017). Since first appearing in the last decade, live-streaming has grown steadily to become one of the largest and most popular forms of media consumption online (Hilvert-Bruce et al., 2018; Taylor, 2018). This is especially true in the area of video-game streaming, where platforms such as Twitch have turned watching other people play video-games into a media format with massive general appeal (Kaytoue et al., 2012; Sjöblom & Hamari, 2017). From January 2021 to January 2022, Twitch users watched 24 billion hours of video game content.

Such incredible consumption means that Twitch today is more than just an entertainment medium. Rather, it represents a meaningful part of the overall videogame industry and is a driving force in videogame development (Johnson & Woodcock, 2019). The impact of Twitch streaming on the videogame industry can be seen through a variety of contexts. Mediatonic, the developer of the videogame "Fall Guys", has actively worked to incorporate Twitch-inspired "game show-like features, including a broadcast mode that lets streamers control the camera, and Twitch integration where viewers can control in-game cannons."[1]

Twitch has also had a large influence on the eSports industry, where skilled videogame players compete in tournaments for cash prizes. ESports as an industry has seen tremendous growth coinciding with the popularity of videogame livestreaming. In 2021, eSports revenues worldwide surpassed $1 billion, representing a year-on-year growth of 14.5%.[2]Throughout this rise, Twitch has been an active

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[1] https://www.washingtonpost.com/video-games/2020/09/17/fall-guys-streaming/ Accessed on 6/9/2022.

[2] Newzoo (2021, March 11). *Global ESports & Live Streaming Market Report 2021* Retrieved from newzoo.com.

sponsor of both individual eSports players and teams. The company has repeatedly stated that eSports is "part of Twitch's DNA" and that the platform is "deeply invested in the success and growth of the eSports ecosystem."[3]

To capitalize on the potential of Twitch, developers create games that provide streamers with specific combinations of affordances. Streamers in turn use these affordances to grow their channels, brands and self-presentations (Abarbanel & Johnson, 2020; Khamis et al., 2017). To do this, they make strategic choices about how best to incorporate these affordances, either focusing on the affordances in one game, or "swinging" between games to amalgamate affordances across multiple games and platforms.

Single-game streamers have some advantages. They invest time in the affordances offered by a particular game, and thereby obtain a better understanding of the symbolism, culture, and customs therein (Hamilton et al., 2014). Yet, single-game streaming also has some important limitations. Forced to devote their channel exclusively to one particular game, their audience comes to expect content related to that game, and switching costs can become prohibitively high. This removes much of the autonomy that streamers have, as it relates to channel themes and content. It also puts single-game streamers at the mercy of videogame developers. If developers make changes to a particular game that lower its appeal in the wider Twitch community, this can significantly affect the streamers' ability to produce quality content (Johnson & Woodcock, 2019).

"Swinging" streamers exhibit their own strengths and weaknesses. They are able to constantly tailor their content to changing market demands. Since their channels are not associated with individual games, they are always in control of their content selections. However, there is a penalty for this lack of specialization. These streamers may never achieve the skill or competency in a particular game afforded to single-game streamers. Games requiring significant skill, for example, may put game-swinging streamers at a significant disadvantage (Cox et al., 2012; Gascon et al., 2015). Swingers must also be able to pick up new content very quickly and generally must exhibit a broader understanding of videogame mechanics to be successful playing multiple games at a high level.

Despite both the massive popularity of Twitch and unique aspects of videogame streaming, the phenomenon of game-swinging in particular, and the ways in which streamers utilize videogames in their live-streaming efforts in general, remain poorly understood. This dearth of research is surprising given recent efforts in other closely related areas, for example, the interpersonal factors that explain successful Twitch streamers (Burroughs & Rama, 2015; Hilvert-Bruce et al., 2018). The lack of attention is also surprising in a practical sense, given the frequent attention paid to these concepts not only within the community of professional Twitch streamers, but also within the wider sphere of social media content producers (Poirier-Poulin, 2020; Taylor, 2018).

This study seeks to explore this gap in research by studying the way that streamer interpersonal factors interact with the videogame content shared by streamers to explain the phenomenon of "game-swinging". The study improves our understanding of who successful streamers are through a more detailed examination of what they choose to stream. Specifically, we examine the question: "What are the platform- and game-specific affordances most associated with streamers' game-swinging behaviour?".

Key findings of the study show that the affordances used by streamers significantly impact their propensity towards game-swinging. As streamers take advantage of affordances offered by streaming platforms, they are provided with access and reach to a large population that spans numerous games and gaming communities. We observe that this results in an increased amount of game-swinging behaviours. Conversely, those streamers that rely on affordances offered by individual games are more likely to invest their time and commitment to specific game titles, reducing their propensity for game-swinging behaviours.

The remainder of the study is as follows. First, we provide a literature review that summarizes extant research in the areas of online swinging behaviour, polymedia, and affordances. Next, a theoretical model is developed that describes Twitch videogame streaming as a polymedia-based collection of affordances. A number of these affordances are specifically identified and their role in determining streamer content decisions is investigated. Results of an empirical analysis are presented and finally discussed, together with some discussion of implications and directions for future research.

## Literature review

### Platform swinging

The concept of game-swinging has been only tangentially discussed in the extant research. The phenomenon is close in principle to the area of platform-swinging, which has received attention in both the Information Systems (IS) and communication literature. A platform refers to a single technology-based communication medium. Most modern videogame platforms serve as communication medium through the incorporation of multiplayer functionality, chat features, and other opportunities for user interaction. Swinging between such platforms happens when users use multiple platforms concurrently and differently (Boczkowski et al., 2018), and

[3] https://www.alistdaily.com/strategy/twitch-became-esports-sponsorship-sales-representative/ Accessed on 6–9-2022.

swinging between gaming platforms allows media users to "exploit a variety of opportunities for communication freed from the constraints of each medium's functionalities" (Madianou & Miller, 2013 p.176).

Different gaming platforms have the potential to provide different gratifications to social media users. Platform-swinging allows users to secure collective gratifications from all of their social media instead of having to settle for limited gratifications offered by individual social media. Through the use multiple platforms, users achieve multi-layered gratifications by "allowing users to navigate through structural barriers (availability), social contexts (communality), and informal rules (acceptability)" (Tandoc et al., 2019, p.31).

In IS literature, very few studies (e.g., Madianou, 2014; Tandoc et al., 2019) have studied the concept of platform-swinging. Madianou (2014) studied platform-swinging in the context of smartphones. She found that the ability of smartphones to let users launch multiple platforms and apps from a single device removes most constraints related to platform-swinging, adding that their compact nature not only facilitates platform-swinging, but also intensifies it and makes it more fluid (Madianou, 2014). Tandoc et al. (2019) conducted focus group discussions with social media users in Singapore to study the phenomenon of platform-swinging and found that social media users engage in platform-swinging to get more gratification opportunities for self-presentation and relationship management.

Platform-swinging in this sense represents the use of a type of polymedia, which Madianou and Miller (2013) define as "an emerging environment of communicative opportunities that functions as an 'integrated structure' within which each individual medium is defined in relational terms in the context of all other media" (p.170). Unlike multimedia, which refers to different media content formats, polymedia refers a media ecology which offers users autonomy in choosing their own media to manage emotional and social relationships (Tandoc et al., 2019). Polymedia shifts the focus away from dwelling on the characteristics and constraints of individual media to understanding social media as an integrated structure of affordances that users can negotiate with in order to manage their emotions and their interpersonal relationships (Madianou & Miller, 2013).

Boczkowski et al. (2018) applied the theory of polymedia to explore platform swinging among social media users in Argentina. They found that users' social media practices are shaped by the meaning they associate with each platform, which in turn is relatively autonomous from the technical affordances offered by each of those platforms. Tandoc et al. (2019) used polymedia theory to study the occurrence of platform-swinging on social media and found that social media users gain gratifications related to self-presentation and relationship management through platform-swinging since they "do not limit themselves to any specific social media platform, instead they are able to efficiently navigate through multiple platforms by exploiting the differences between these platforms" (Tandoc et al., 2019, p.22). In the social media context, platform-swinging is a behavioural manifestation of polymedia (Tandoc et al., 2019). Madianou (2014) applied polymedia theory to study smartphone use among UK-based Filipino migrants and found that smartphones do function as polymedia by serving as a "converged, multifaceted technological environment for personal communication and relationships" (p.667).

While platform-swinging has been studied using different methodologies including online surveys (Junyun & Xuebing, 2021) and focus group discussions (Tandoc et al., 2019), IS researchers have called for future studies to explore platform-swinging using other methods (Tandoc et al., 2019). Our study not only addresses calls from IS researchers to study platform-swinging in the context of social media in greater detail using alternate research methods, but also is in line with Boczkowski et al. (2018), who state that scholars should conceptualize social media use not from the perspective of an individual platform, but from the point of view that social media use depends on the contemporaneous values that users attribute to all platforms they use simultaneously.

## Affordances

An affordance is an actual or a perceived actionable property of an object designed to satisfy the specific needs of an individual (Gibson, 1977; Norman, 1988). Affordances are the "possibilities for goal-oriented action afforded to specific user groups by technical objects" (Markus & Silver, 2008 p. 622). Each user perceives the material properties of a technology differently, leading to unique affordances for that user (Leonardi, 2011).

In the context of social media, an affordance is an action possibility (i.e., a communication opportunity) that the media offers its users to manage interpersonal relationships. Affordances are one of the key dimensions of polymedia (Madianou & Miller, 2013), in the sense that they are what social media users can exploit within the composite structure of polymedia (Madianou, 2014). Social media platforms offer distinct as well as overlapping affordances, which enable various self-presentation strategies and relationship management strategies on social media (Tandoc et al., 2019).

Users can exploit communication affordances in polymedia to manage their social and emotional relationships (Madianou & Miller, 2013). Boczkowski et al. (2018) add that "the role of affordances appears to vary by platform: for instance, the informality of Snapchat is tied to its ephemerality, but that of Twitter is not" (p.255). This leads to platform-swinging as social media users exploit affordances inherent in platforms to "continuously fulfil their gratifications and

ensure that the gratification opportunities are always present" (Tandoc et al., 2019, p.26).

In the context of IS literature, affordances have been studied in the areas of flexible work routines (Leonardi, 2011), electronic health records (Burton-Jones & Volkoff, 2017), children's math learning (Moyer-Packenham et al., 2019), online knowledge communities (Chen et al., 2019), and online cyberbullying (Chan et al., 2019). Leonardi (2011) used the theory of affordances to study flexible routines and flexible technologies in an organizational context and found that employees who perceived constraints tend to use flexible technologies while those who perceived affordances tend to use flexible routines. Burton-Jones and Volkoff, (2017) use the notions of affordance networks and affordance actualization to study effective use of community-care Electronic Health Record (EHR) systems and found that effective use of the systems depended not only on the accuracy and consistency of user interactions with the EHR, but also on how they engage in self-reflection as they actualize affordances across the entire affordance network. Moyer-Packenham et al. (2019) studied the impact of the design features of digital math games on children's math learning and found that children who were aware of specific design features in a game were able to take advantage of affordances to learn math compared to those students who were unaware of such features. Chen et al. (2019) used the theory of motivational affordances to study the motivational impacts of two key online knowledge community features, namely usefulness voting and commenting, on knowledge contribution and found that positive usefulness votes motivated knowledge contribution while commenting moderated the relationship between usefulness voting and knowledge contribution in the online knowledge community. Chan et al. (2019) used the affordance perspective to investigate cyberbullying on social networking sites and found that the affordances offered by these sites create favourable conditions for cyberbullying.

In terms of the different types of affordances identified in IS literature, Burton-Jones and Volkoff (2017) identified nine types of affordances: inputting data, accessing data, clinical decision-making (simple), team decision-making, coordinating, clinical decision-making (complex), monitoring, reporting, and managerial decision-making. In the context of gamification, Liu et al. (2017) discussed technology affordances. Sjöblom et al. (2019) examined social affordances and revenue affordances on the live-streaming platform Twitch. Chen et al. (2019) examined the motivational affordances of usefulness voting and commenting in the context of online knowledge communities. Chan et al. (2019) investigated four types of affordances on SNS: accessibility, information retrieval, editability, and association. Faik et al. (2020) identified sensegiving, translating, and decoupling as three information technology (IT) affordances which promote societal change. In the context of self-monitoring and self-management, Jiang and Cameron (2020) highlight four affordances, namely, preparation affordances, data-collection affordances, user-reflection affordances, and social-connection affordances.

We found very few studies in IS literature (e.g., Chan et al., 2019; Chen et al., 2019; Sjöblom et al., 2019) which have examined affordances from a social media perspective. There have been calls for future research to explore affordances associated with specific social networking platforms other than Facebook (Chan et al., 2019). An even smaller subset of those studies (e.g., Sjöblom et al., 2019) explored affordances on the Twitch platform. Twitch offers "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" (Sjöblom et al., 2019, p.23). Our understanding of streamer incentives for participation on Twitch continues to remain limited since most studies on Twitch are behavioural in nature as opposed to channel design and streamer-affordances oriented. Our study adds to IS literature by examining affordances on Twitch in greater detail.

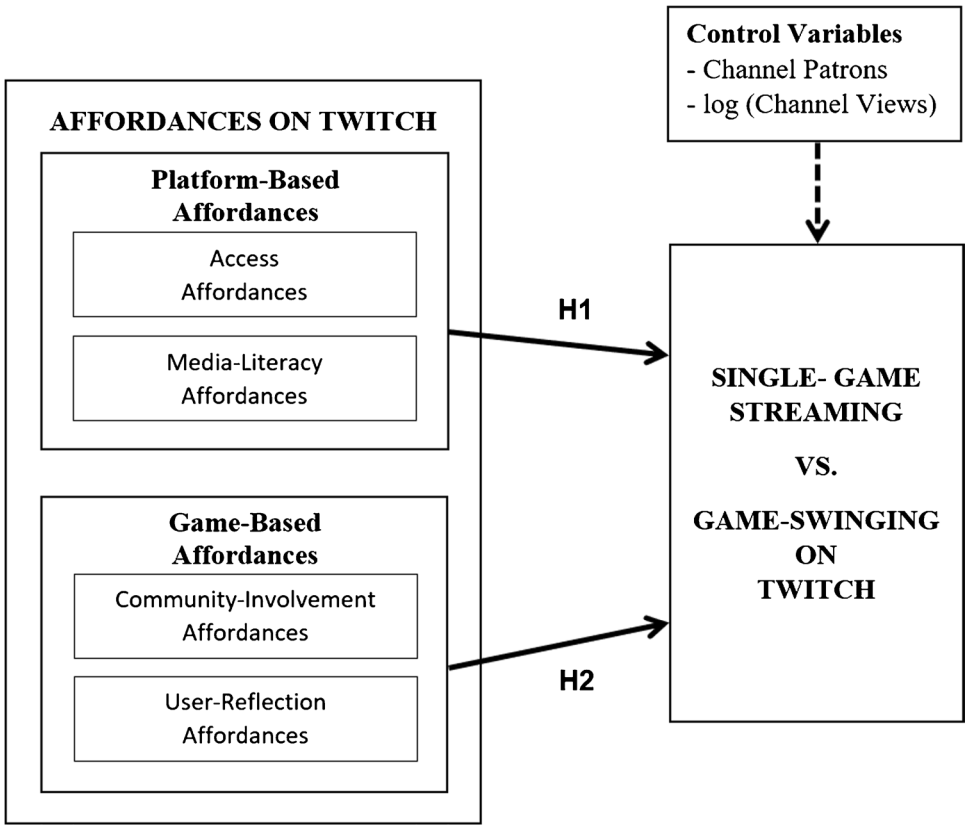
## Theoretical foundation and hypotheses development

Figure 1 presents a theoretical model of affordances and their proposed relationship to game-swinging behaviour on live-streaming platforms. We propose predominant categories of affordances, those attributable to the games streamers play, and those attributable to the live-streaming platform itself. As discussed in the following section, platform-based affordances are hypothesized to promote game-swinging, while game-based affordances lead to a reduction in game-swinging behaviour. The model also incorporates several control variables related to channel popularity, including the presence of channel patrons and measures of channel viewership.

### Platform-based affordances and game-swinging

As stated earlier, a platform such as Twitch is a single technology-based communication medium. Platforms provide users with a plethora of ways to communicate with other users who are also on those platforms (Madianou & Miller, 2013). In this way, they help users to overcome constraints through the implementation of holistic polymedia communication environments useful for managing emotional and social relationships (Tandoc et al., 2019; Madianou, 2014). The actual mechanism by which polymedia platforms allow users to overcome these constraints involves an integrated structure of technology-mediated affordances (Madianou & Miller, 2013). These affordances represent actionable

**Fig. 1** Research model




properties of a technical artefact designed to satisfy the specific needs of an individual (Gibson, 1977; Norman, 1988). Specifically, we consider two types of these affordances, related to the areas of both *access* and *media literacy*.

*Access affordances* refer to the extent to which a platform offers a user the opportunity to connect to other users on the platform (Chan et al., 2019). Access affordances, which are a critical part of an affordance actualization network, are necessary for effective use of information systems (Burton-Jones & Volkoff, 2017). Users who took advantage of access affordances exhibited higher gains that those who did not (Moyer-Packenham et al., 2019). Platform-based access affordances allow streamers to strategically grow their audience-base (Khamis et al., 2017). They do this by means of synchronous streaming delivery, as well as expanded possibilities for interpersonal interaction between creators and consumers. Since most streamers are not famous in their own right, but rather have come to prominence through the Twitch platform, affordances that allow for connectivity with a target audience are extremely important (Djafarova & Trofimenko, 2019; Hou, 2019). Recognizing that their content gives them micro-celebrity status, they carefully control and mitigate access between themselves and their audiences (Khamis et al., 2017).

Access affordances are designed to result is mass appeal and not to satisfy the focused interest of specific audiences. Streamers who focus on mass appeal are therefore likely to spend more time increasing access to their audience base by streaming multiple games on the Twitch platform. They do so instead of trying to spend more time providing high quality live-streaming experiences to their current audiences. Thus, streamers who seek to take advantage of platform-based access affordances are more likely to engage in multi-game streaming and game-swinging behaviour.

*Media-literacy affordances* refer to motivational affordances designed to allow users to learn new knowledge and to improve their current knowledge level (Chen et al., 2019). Access, in and of itself, does not guarantee media literacy (Hargittai & Walejko, 2008). In addition to access, media literacy involves the ability to assess, evaluate, and produce content (Livingstone, 2004). Media-literacy platform affordances allow streamers to track numerous aspects of their streaming performance including the number of viewers for each stream, the number of patrons for the channel, and the level of donations using bits or microtransactions during chat sessions that are a part of live-streaming experience (Sjöblom et al., 2019). These affordances also provide a way for streamers to demonstrate their streaming habits to viewers and show viewers what to expect from a particular channel (Hamilton et al., 2014). Streamers take advantage of media-literacy affordances as they build their channels, brands, and self-presentations on Twitch (Kay et al., 2020).

Aware that their streaming habits are monitored and used by viewers in making channel selections, streamers do not engage in random streaming behaviour. Rather, they structure their streams purposefully in order to target their audience in a similar manner to other social media personalities and influencers (Johnson et al., 2019; Nematzadeh et al., 2016). As media literacy develops, it becomes easier to understand why a user has chosen a specific platform as a social act (Madianou & Miller, 2013).

Using the Twitch platform, streamers are able to easily keep track of their media-literacy platform affordances without having to spend a ton of time tracking it themselves. Similar to access affordances, media-literacy affordances allow streamers to increase the mass appeal of their channel on Twitch. Thus, media-literacy affordances are mostly sought by multi-game streamers. Game-swinging not only allows increased access to a larger audience-base, but also lets a streamer keep track of media-literacy effortlessly, thereby making such platform-based affordances easier to acquire.

Based on the above arguments, we propose the following hypothesis:

> ***H1***: *Platform-based affordances are positively associated with multi-game streaming and game-swinging behaviours on Twitch*

## Game-based affordances and game-swinging

In addition to the platform-based affordances discussed above, Twitch users also utilize affordances from the games they choose to stream. Developers purposefully build affordances into their games (Gascon et al., 2015), and through these affordances, streamers are able to maximize the performance of their streaming channels. Specifically, we identify two types of affordances stemming from the games that streamers play. These are affordances related to *community involvement* and those related to *user reflection*.

*Community-involvement affordances*, also referred to as social affordances (Sjöblom et al., 2019), are based on the fact that humans have a deep-rooted psychological need for reaching out to others, helping others, and wanting to form a community (Deci & Ryan, 2013). Modern video game communities often contain robust symbolism, culture, and customs all their own (Bainbridge, 2012; Geraci, 2014). These games therefore exist as online communities in and of themselves. In such environments, an understanding the collective norms, culture and shared values of such communities helps to foster a sense of community and collectiveness (Kim et al., 2012). However, developing such an understanding requires a significant investment of time on the part of the streamer as well as on audience members. To really understand the community that exists around a title, both streamers and viewers must mutually invest effort, time, and energy (Kaytoue et al., 2012).

This requisite time investment means that, unlike the platform affordances previously discussed, community-involvement affordances may be less likely to result is widespread appeal, but rather generate carefully focused interest with specific audiences. Single-game streamers, who more likely to invest the time needed to fully understand a game's symbolism, culture, and customs, are thus able to provide a high quality live-streaming experience to their viewers. In this sense, the extent to which individuals incorporate community involvement affordances is likely to reduce the propensity for game-swinging and rather encourage single-game streaming.

*User-reflection affordances* refer to the ability of an information system to allow its users to discover actionable insights, patterns, and correlations from data using the information technology functionalities of data display, push messages, and gamification (Jiang & Cameron, 2020). Many videogames in existence today exhibit user-reflection affordances. Effective use of information systems requires users to engage in self-reflection as they actualize affordances across the entire affordance network (Burton-Jones & Volkoff, 2017). User-reflection affordances allow users to successfully self-assess themselves (Jiang & Cameron, 2020) in a process of conscious self-construction (Junyun & Xuebing, 2021). These affordances are designed to provide players with the ability to showcase either individual characteristics or attributes (Kaytoue et al., 2012; Sjöblom & Hamari, 2017). Game developers often go to great lengths to provide players with the ability to showcase their skill or knowledge of videogame content (Cox et al., 2012). Furthermore, viewing skilful displays of gaming prowess is known to be an important driver of videogame streaming viewership (Hamari & Sjöblom, 2017).

Through such user-reflection affordances, game players gain the ability to set themselves apart from less-experienced players. For Twitch streamers, this can mean attracting an audience by engaging in gaming feats that are beyond the capability of most viewers (Kaytoue et al., 2012). Examples of this are plentiful in the area of eSports games. ESports streamers go to significant lengths to entertain their audiences by tackling extremely difficult game content, or completing content in ways that demonstrates very high levels of skill and dedication.

Thus, capitalizing on user-reflection affordances likely requires significant outlay of time and resources on the part of the streamer. Similar to community-involvement affordances, the time required to cultivate and utilize user-reflection affordances likely means that such affordances are mostly sought by single-game streamers. Game-swinging, on the other hand, dilutes the time and energy that a streamer can devote to both specific communities and user-reflection,

thereby making such game-based affordances more difficult to acquire. We therefore hypothesize the following:

***H2***: *Game-based affordances are negatively associated with multi-game streaming and game-swinging behaviours on Twitch*

## Methods

### Data collection

The unit of analysis in the study is the individual Twitch streamer. Using a publicly available database consisting of a large number of Twitch usernames, we randomly sampled a number of Twitch streamers for inclusion in the sample. As the study is interested in the performance of individual streamers, any accounts operated by more than one individual were excluded from the sample. Ultimately a total of 5,656 streamer pages were then examined and were evaluated over a period of eight weeks beginning on November 8, 2019 and ending on January 6, 2020.

Data on streamer activity over this time period was collected from the Twitch API, which makes available a variety of information related to streamers as well as the names of games that they stream. The API includes very specific information on the time and date of a stream, the number of stream viewers, the game streamed, etc. However, because Twitch is more than just a game streaming service, demographic information on games themselves is limited within Twitch. This made it limited for the purposes of examining game swinging behaviour. For this reason, we constructed a novel dataset by combining this information with detailed demographic information on games taken from the website Steam.

A WebCrawler was constructed to collect demographic information on all games referenced within the streaming data collected from Twitch. Steam, as a game retailing store, contains large amounts of publicly available information related to game demographics. Once combined, the two datasets provide a more complete picture of both streamer activity and the games that make up the central focus of much of the streaming behaviour.

As this study uses data on individual streamers, it raises reasonable concerns regarding user privacy. However, all data used in the study was made public not only on the Twitch platform through the Twitch API, which actively shares this type of data across numerous websites that monitor and track Twitch use on a continuous basis, but also on the Steam website. Therefore, no personally identifiable information was collected on any Twitch users beyond what was openly shared on the Twitch platform. No real names, addresses or other personally identifiable information was collected or used in our analyses at any time.

### Variables of interest

Our dependent variable of single-game streaming versus game-swinging was operationalized as a Boolean value coded as *one* for game-swinging and *zero* for single-game streaming. Each channel was monitored to see the average number of games streamed over the period of data collection. If the streamer streamed on average more than one game they were coded as a swinger. Otherwise, if the streamer's time was devoted to a single game, they were recorded as a single-game streamer.

Data was collected on three different variables related to platform-based affordances. We operationalized duration hours as a continuous variable comprising the total amount of content available (in hours) for a particular channel. Streamer tenure was operationalized as a continuous measurement of the length of time (in years) during which a Twitch streamer has maintained an active presence on Twitch. Interestingly, some streamers actually have tenures longer than the lifespan of Twitch, as these accounts are rolled over from Twitch's predecessor Justin.tv. Finally, Twitch prime time is a Boolean value coded as *one* if the user tends to stream during Twitch prime time hours and *zero* otherwise. For this study, prime time was calculated as 3 PM to 2 AM GMT. These hours have been consistently shown to represent worldwide peak viewership (Taylor, 2018).

We additionally operationalized a total of three game-based affordances. ESports is a Boolean value coded as *one* if the streamer tends to stream predominantly eSports related games and *zero* otherwise. For the purposes of this study, eSports games are those games that have robust professional leagues and tournament options available with cash prizes. The list of games that classified as eSports was taken from the eSports tracking website eSportsearnings.com.

Game price was operationalized as the price in US dollars of the games streamed. Prices were taken based on game listings on the popular gaming marketplace Steam. Game price is likely an important indicator of community involvement. The more expensive a game is, the more prohibitive are the switching costs for both streamers and viewers to switch to a different game. As a consequence, the higher the value for money afforded by a game, the less likely a streamer is to be a swinger.

Finally, game sentiment was operationalized based on the sentiment score for a particular game on the Steam marketplace. Each game received a sentiment score on a scale ranging from extremely *negative* (*0*) to *extremely positive* (*10*).

**Table 1** Descriptive statistics of sample of Twitch streamers

| Variable of Interest | N | Mean | Std. Dev | Min | Max |
|---|---|---|---|---|---|
| Streaming Category (Dependent Variable) | | | | | |
| Single-game | 1,007 (18%) | | | | |
| Game-swinging | 4,649 (82%) | | | | |
| Platform-Based Affordances | | | | | |
| Avg. Stream Duration (in hours) | 5,656 | 4.98 | 0.38 | 1.3 | 28.2 |
| Streamer tenure (in years) | 5,656 | 8.09 | 2.26 | 0.43 | 12.89 |
| Twitch Prime Time Streaming | | | | | |
| Yes | 1,864 (33%) | | | | |
| No | 3,792 (67%) | | | | |
| Game-Based Affordances | | | | | |
| ESports Game | | | | | |
| Yes | 3,862 (68%) | | | | |
| No | 1,794 (32%) | | | | |
| Game Price (in USD) | 5,656 | 9.63 | 13.77 | 0 | 60 |
| Game Sentiment | 5,656 | 7.67 | 0.98 | 0 | 10 |
| Control Variables | | | | | |
| Log of Channel views | 5,656 | 7.73 | 1.37 | 2.3 | 13.65 |
| Channel Patrons | | | | | |
| Yes | 279 (5%) | | | | |
| No | 5,377 (95%) | | | | |

## Control variables

Finally, two control variables were included in the analysis. These variables were included to control for the general popularity of the Twitch channel. First, we include a variable indicating whether a channel allowed for and obtained "paid" patrons within Twitch. Patronage within Twitch is a complex relationship that allows individuals to pay money for additional influence in terms of the content and direction of a particular streaming channel (Wohn et al., 2019). We controlled for the presence of patrons so as to isolate the streamers platform-swinging decision independent of paid influence of individual Twitch viewers. Additionally, we control for the overall average viewership of the channel. Controlling for total viewership is necessary because channels with very large or very small viewership may exhibit different content creation behaviours from that of an average Twitch streamer (Hilvert-Bruce et al., 2018). Full descriptive statistics are provided in Table 1 below.

## Empirical analysis and results

All variables were entered simultaneously into a logistic regression procedure incorporating robust standard errors in Stata. Results of the analysis showed that all variables played a significant role in determining a streamer status as a single-game streamer or a game-swinger. Results differed significantly in terms of magnitude and directionality.

Complete regression results and odd ratios are presented in Table 2. This is followed by an interpretation of the regression coefficients and the odds ratios for each of the variables in our research model.

Hypothesis *H1* proposed a positive association between the use of platform-based affordances and game-swinging behaviours on Twitch. Among the three platform-based affordance variables included in the model, duration hours (0.18; $p < 0.01$), platform tenure (-0.06; $p < 0.05$), and Twitch prime time (0.21; $p < 0.05$) all had a significant

**Table 2** Regression results and odds ratios

| Variable | Regression Coefficient | Odds Ratio |
|---|---|---|
| Platform-Based Affordances | | |
| Average Stream Duration | 0.18 (0.025)** | 1.19 |
| Streamer Tenure | -0.06 (0.017)* | 0.94 |
| Twitch Prime Time Streaming | 0.21 (0.078)* | 1.23 |
| Game-Based Affordances | | |
| ESports | -0.27 (0.089)* | 0.77 |
| Price | -0.01 (0.003)* | 0.99 |
| Sentiment | -0.11 (0.042)* | 0.90 |
| *Control Variables* | | |
| Patrons | 0.85 (0.274)* | 2.35 |
| Average Views | 0.18 (0.033)** | 1.19 |

Robust standard errors in parentheses

** $p < 0.01$, * $p < 0.05$

**Table 3** Results of hypotheses testing

| Hypotheses | Variables | Significant? | Supported? |
|---|---|---|---|
| *H1*: *Platform-based affordances are positively associated with multi-game streaming and game-swinging behaviours on Twitch* | Average Stream Duration | Yes ($p < 0.01$) | Supported |
| | Streamer Tenure | Yes ($p < 0.05$) | |
| | Twitch Prime Time Streaming | Yes ($p < 0.05$) | |
| *H2*: *Game-based affordances are negatively associated with multi-game streaming and game-swinging behaviours on Twitch* | ESports Streaming | Yes ($p < 0.05$) | Supported |
| | Game Price | Yes ($p < 0.05$) | |
| | Game Sentiment | Yes ($p < 0.05$) | |

impact on single-game streaming versus game-swinging. Hypothesis *H1* is thus supported. These logistic regression results are most easily interpreted as odds ratios. The odds that a streamer participated in game-swinging increased by almost 20% for each additional hour of average stream length. Additionally, the odds of game-swinging were 23% higher for channels streaming in Twitch prime time hours. Interestingly, increased platform tenure lowered the odds of game-swinging, with each additional year of tenure decreasing the odds of game-swinging by 6%.

Conversely, whereas platforms-based affordances were hypothesized to increase game swinging behaviours on Twitch, hypothesis *H2* proposed that game-based affordances should be negatively associated with such behaviours. In accordance with hypothesis *H2*, all game-based affordances did in fact lower the odds of game swinging. Thus, hypothesis *H2* is also supported. The largest effect was seen with eSports (-0.27; $p < 0.05$). Streamers who focus on eSports content were approximately 23% less likely to engage in game-swinging. Higher game prices (-0.01; $p < 0.05$) also decreased the odds of game-swinging by approximately 1% for each additional US dollar of game price. Finally, game sentiment (-0.11; $p < 0.05$) decreased the odds of game-swinging by 10% for every additional point of sentiment.

Both control variables also had an impact on single-game streaming versus game-swinging. The presence of Twitch patrons (0.85; $p < 0.05$) more than doubled the odds of game-swinging. Channel average views (0.18; $p < 0.01$) increased the odds of game-swinging by approximately 19% for every point on the natural log scale. The results of hypotheses testing are presented in Table 3. The implications of our results are fully discussed in the next section.

## Discussion

In this study, we used an affordances perspective to investigate the phenomenon of game-swinging on the Twitch livestreaming platform. Based on literature, we characterized affordances offered on Twitch as either platform-based affordances or game-based affordances. We then used these two categories of affordances as independent variables in our research model. Our dependent variable was single-game streaming vs. game-swinging on Twitch.

The first category of affordances in our research model is platform-based affordances. We specifically focused on two types of platform-based affordances, namely, access affordances and media-literacy affordances. Access affordances, refer to the extent to which a platform user is afforded the opportunity to connect to other users on the platform (Chan et al., 2019). Twitch offers access affordances to streamers who are interested in generating mass appeal by allowing them to connect with a target audience (Djafarova & Trofimenko, 2019; Hou, 2019) and to strategically grow their audience-base (Khamis et al., 2017). Media-literacy affordances refer to motivational affordances designed to allow users to learn new knowledge and to improve their current knowledge level (Chen et al., 2019). Twitch offers media-literacy affordances to streamers as they build their channels, brands, and self-presentations on Twitch (Kay et al., 2020) by allowing streamers to track numerous aspects of their streaming performance including the number of viewers for each stream, the number of patrons for the channel, and the level of donations using bits or microtransactions during chat sessions that are a part of live-streaming experience, and so on (Sjöblom et al., 2019).

In this study, we operationalized platform-based affordances (access affordances and media-literacy affordances) using three variables, namely average stream duration in hours, streamer tenure on Twitch in years, and whether or not the streamer prefers to livestream during Twitch prime time hours. Results of our empirical analyses showed that platform-based affordances are positively associated with the phenomenon of game-swinging on Twitch. This means not only that access affordances lead to increased game-swinging on Twitch, but also that media-literacy affordances too increase the propensity of streamers to engage in game-swinging behaviours.

The second category of affordances in our research model is game-based affordances. We specifically focused on two types of game-based affordances, namely, community-involvement affordances and user-reflection affordances. Community-involvement affordances are based on the

deep-seated psychological need for reaching out to others, helping others, and wanting to form a community (Deci & Ryan, 2013). Most video games offer community-involvement affordances by allowing online communities to form around the robust symbolism, culture, and customs offered by those games (Bainbridge, 2012; Geraci, 2014) helping foster a sense of community and collectiveness (Kim et al., 2012). User-reflection affordances allow users to successfully self-assess themselves (Jiang & Cameron, 2020) in a process of conscious self-construction (Junyun & Xuebing, 2021) by helping them discover actionable insights, patterns, and correlations from data using the information technology functionalities of data display, push messages, and gamification (Jiang & Cameron, 2020). Video games offer user-reflection affordances by providing players with the ability to showcase either individual characteristics or attributes (Kaytoue et al., 2012; Sjöblom & Hamari, 2017) and their skill or knowledge of videogame content (Cox et al., 2012).

In this study, we operationalized game-based affordances (community-involvement affordances and user-reflection affordances) using three variables, namely whether the streamer streams eSports games, game price, and game sentiment. Results of our empirical analyses showed that game-based affordances are negatively associated with the phenomenon of game-swinging on Twitch. This means not only that community-involvement affordances lead to reduced opportunities for game-swinging behaviours on Twitch, but also that user-reflection affordances too decrease the propensity of streamers to engage in game-swinging behaviours. In the next few sections, we discuss our study's theoretical contributions and the practical implications of our findings.

## Theoretical contributions

Our study makes several important contributions to IS literature. First, the study established Twitch live-streaming platform as polymedia, in the sense that Twitch is both a technology-based communication platform (Madianou & Miller, 2013), and a media environment. Twitch users choose their own technical tools to manage emotional and social relationships (Tandoc et al., 2019), satisfying the polymedia preconditions of access, affordability, and media literacy (Madianou, 2014). Twitch solves the access constraint by allowing platform access from any Internet-enabled device from anywhere in the world. It overcomes the affordability constraint by being provided free-of-charge to streamers and mostly free to viewers unless certain streamers decide to require subscriptions in order to access their content. Finally, Twitch solves the media literacy constraint by allowing streamers a variety of technical tools designed to produce, assess, and evaluate their own content.

Next, the study is one of the first to study the factors that impact streamers' decisions regarding game-swinging from an affordances perspective. Studying affordances on Twitch is critical to the survival of the Twitch platform itself as "consideration of motivational affordances designed into online communities allows a more contextualized and comprehensive understanding of the antecedents that stimulate continued use" (Chen et al., 2019, p.22). The affordances perspective in this study addresses calls by IS researchers to investigate specific affordance combinations offered by live-streaming platforms (Sjöblom et al., 2019) and to do so in platforms other than Facebook (Chan et al., 2019).

From a theoretical perspective, the study specifically shows that platform-based affordances tend to provide access, which exposes streamers and their audiences to a wide variety of content, thus lessening the depth of exposure to any one gaming community. In response to these access affordances, streamers utilize polymedia so as to deliver a constantly changing stream of content with more mass appeal.

A novel finding from our study, especially as it pertains to the virtual community literature, is the fact that, with time, streamer preferences tend to shift from platform-based to game-based affordances. Through this analysis of the temporal aspects of affordances offered by Twitch, we confirm that affordances are very rarely static in nature (Gaver, 1991). Through this important finding, our study adds a third category of time-based affordances to the areas of social and revenue affordances (Sjöblom et al., 2019) already identified in this area of literature. This third category of affordances has significant implications for literature that examines the health of social commerce platforms. The migration from mass platform access affordances to more targeted game-based affordances helps to explain how virtual communities over time tend to create smaller pockets of dedicated users. The finding agrees with past work, for example, Tsai and Bagozzi (2014), which posits that "community cultivators should focus on increasing members' identification with the communities and especially the small group in which they frequently participate" (p. 158). Our study extends these research efforts by providing examples of how this can be done, namely through reduced focus on platform-based affordances and increased involvement in focused (i.e., single-game) communities.

One potential strategy for deepening community involvement in this regard concerns the area of eSports. Our study supports past work that identifies a significant sense of community in videogame titles that have challenging content (Cox et al., 2012; Gascon et al., 2015). The challenge and prestige that comes from prowess in eSports games likely increases community involvement, thereby lending eSports games to single-game streaming (Burroughs & Rama, 2015; Hamari & Sjöblom, 2017). Live-streaming allows viewers to see other people tackle videogame content that may be too challenging or too time-consuming for them to experience

themselves (Kaytoue et al., 2012). Users gain a sense of camaraderie from collectively experiencing and overcoming difficult game content (Scully-Blaker et al., 2017). As a result, the shared sense of triumph leads to a deeper sense of involvement in the community. At the same time, the time investment required to achieve prowess in eSports games creates a sunk cost for both the streamer and viewers (Hallmann & Giel, 2018). Capitalizing on these sunk costs is one way to increase the level of attachment in single-game communities.

In addition to these findings, the current study also answers calls to examine platform-swinging in the context of social media in greater detail (Boczkowski et al., 2018). The study also adds to the very limited work on platform-swinging in the IS literature (e.g., Madianou, 2014; Tandoc et al., 2019). Platform-swinging has been studied using different methodologies including online surveys (Junyun & Xuebing, 2021) and focus group discussions (Tandoc et al., 2019). IS researchers have called for future studies to explore platform-swinging using other research methods (Tandoc et al., 2019). We contribute in this area in two ways. First, our econometric analysis of data collected on the Twitch live-streaming platform expands the diversity of methods used in this body of research. Moreover, we combine the social platform (Twitch) with game communities to create an entirely novel approach to examining streaming behaviour.

## Practical implications

In addition to the theoretical implications identified above, results of the study offer practical implications for streamers, game developers, and live-streaming platforms. Practical implications centre on the dichotomy identified through our analysis between the selective appeal of affordances provided by individual games and the larger "mass" appeal of affordances inherent to the live-streaming platform. Results of the study show that game-swingers take full advantage of platform-based affordances (Hu et al., 2017). By comparison, single-game streamers were more likely to take advantage of the affordances inherent in video games.

Moreover, we find that this behaviour differed with respect to time. Platform tenure ultimately led to experienced streamers migrating away from platform affordances and relying on those available in games. The practical interpretation of this finding is that, as a channel matures, it may also specialize, and the mass appeal affordances of the platform tend to produce less benefits than affordances offered by video games themselves.

Platforms should be very aware of the migration to single-game streaming. If streamers exhibit a long-term tendency to disregard platform affordances, platforms may find themselves struggling to maintain viewership. This could be especially problematic as live-streaming technology becomes more ubiquitous, perhaps even diffusing to the point of being directly implemented into computer operating systems or the video games themselves (Ahmad et al., 2018). To avoid this, Twitch and other live-streaming platforms should continue to develop and promote high-quality affordances that are relevant and useful not just to those streamers that want to achieve mass market success, but also those that seek to closely align themselves with individual games and game developers. This could include efforts around co-branding, sponsorships, etc.

Another important finding concerns the influence of price on the odds of single-game streaming. Our analysis showed that each additional US dollar of game price increased single-game streaming odds, and we interpret this finding as indicative of community investment in a way similar to eSports as discussed above. Just as the shared experience of difficult content may lead the development of shared sense of community, so too may an outlay of monetary funds (King et al., 2019). Viewers tend to be most interested in content that showcases video games that they themselves have an opportunity to play (Kaytoue et al., 2012). Viewers who watch a particular game often own that game themselves. Thus, since both the streamer and the viewers have spent money to participate in a particular game, these sunk costs make both less interested to move away from that game to other titles.

This finding has significant implications for videogame developers, who are actively capitalizing on additional methods of commercializing videogames today including microtransactions and advertisements. Many of these games are distributed freely, with the expectation that ads and microtransactions will ultimately make up the development costs. Blockbuster games such as Fortnite attest to the lucrative nature of these alternative payment models (Cai et al., 2019). However, more work is needed to assess the potential penalty that may exist in terms of community health for such free-to-play games. When streamers and users have not been forced to pay anything to participate, it may be much easier for both viewers and streamers alike to move on to the next big release.

Lastly, our finding around prime-time streaming underscores the fact Twitch and other live-streaming platforms represent mass-market broadcasters. As such, they afford streamers with worldwide reach. However, this reach necessitates a general nature to content delivery (Johnson et al., 2019; Taylor, 2018). In other words, it does not appear to behove a streamer to seek out a worldwide audience for the purposes of streaming a very specific type of content. This finding contributes to research that has shown that mass-market media, for example television and movies, necessarily makes sacrifices in terms of story, writing, etc., so as to capitalize on the widespread appeal afforded by a large-scale release (Simon, 1997; Swanger, 1993).

## Limitations and directions for future research

As with any study, this work does come with some limitations. One limitation concerns the cross-sectional nature of the analysis. Because the analysis is not longitudinal, it is only possible for us to observe the behaviour of individual streamers at a single point in time. To help overcome this limitation the data, we examined streamers after a period of 10 weeks to determine whether they had made changes to their streaming behaviour since our data collection. Through this follow-up analysis we were able to confirm that the decision towards single-game streaming or game-swinging appears to be very stable. Streamers in the sample made changes to their streaming behaviour only rarely. Still, a future research could conduct a longitudinal analysis of single-game streaming versus game-swinging to determine whether or not such behaviour may change over a period of years. This would allow both platforms and game developers greater insights into the ways that their platform- and game-based affordances actually influence the behaviours of individual streamers over time.

Another limitation of the study concerns the lack of demographic variables available on streamer audiences. A lack of audience-level data is an unfortunate aspect of many live-streaming studies, since virtually all data on viewership is carefully controlled by the Twitch platform. Future research should work to help explicate this gap in research, and platforms themselves are encouraged to partner with researchers to help best understand the underlying factors of live-streaming behaviour.

In this study, we used positivist research procedures such as inferential statistics, hypotheses testing, and mathematical analyses (Lee, 1991) with the main goal of theory testing (Bacharach, 1989). In this research paper, we were interested in testing predictions we made based on our theoretical foundation using the theory of affordances. Thus, we believe the positivist approach is more suited to this research. Future research should use alternate research paradigms such as interpretivism (Lee, 1991) to gain a more in-depth understanding of the game-swinging behaviours on Twitch.

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