Hypothesis

The "Slotstreams" Phenomenon on Twitch.Tv: Can it Lead to Online Gambling?

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Abstract: (1) Background: Twitch.tv is a live video content website. As of 2022, Twitch users are generally adolescents and young adults, with estimates of the percentage of users aged 16-24 between 22.3% and 41%, predominantly males with estimates ranging from 65% to 78.36%. In recent years, "slotstream" content has become increasingly popular, where streamers gamble online while users watch them. (2) Methods: from July 2022 to November 2022, we researched articles related to Twitch, live streaming, gambling, casino, slot, gambling online, modeling, social media influencers, conditioning, and celebrities, searching for relevant studies in the databases LexisNexis Academic, Business Source Complete, PubMed, Web of Science, Freedom Collection, Health & Medical Collection, Elsevier Journal, Springer, APA PsycARTICLES, Wiley, and other single journals. (3) Results: we took into consideration Gambling Disorder, Online Gambling Disorder, and Internet Gaming Disorder on the one hand, and consumer components such as persuasive communication and influencer-audience relationship on the other; we then hypothesized that the presence of these variables within the slotstream format is positively correlated with the development of pathological gambling, especially in an adolescent audience. (4) Conclusion: we assume that there is a positive correlation between watching slotstream content and the probability of developing both pathological and non-pathological gambling behavior.

Keywords: twitch.tv; twitch; live streaming; online gambling; addiction; gambling disorder; internet use; slotstreams; online casino; online slots.

1. Introduction

The main diagnostic manuals identify pathological gambling or gambling disorder ("gambling disorder") as a compulsive behavior towards gambling that impairs the psychosocial functioning of the affected person and causes serious economic, relational, and individual consequences [1]. Previously regarded as an impulse control disorder (DSM-IV), Gambling Disorder (GD) was only classified as a behavioral disorder in the latest version of the manual, which currently regards this condition as a genuine addiction disorder [2]. When pathological gambling behavior is implemented online or in video games, we talk about Online Gambling Disorder (OGD) [1].

Starting in 2016 and up to 2019, general gambling underwent a slight increase in variation, then stopped in 2020 (arrest obviously due in large part to the pandemic from COVID-19); from 2021 onwards, we see a surge in the phenomenon, which is expected to continue during 2023 [3].

As for online gambling, however, the data shows that the pandemic from COVID-19 had no impact on its performance, which on the contrary has seen steady and relatively stable growth over the past six years. Again, expectations for 2023 do not seem to announce a change in the advancement of online gambling behavior [3].

Data for the UK population indicate that in 2020 the age distribution of online gambling is fair: the 16 to 24-year-olds occupy 16.9% of the graph, representing the smallest slice, while the 35 to 44-year-old occupies the largest slice, that's 29.3 percent [3].

In Italy, in 2020, 42% of 14-19-year-olds gambled (compared to 48% in 2018 and 54% in 2014) [4]. Of these, 9% have developed behaviors that fall within the scope of addiction, characterized by negative repercussions on the socio-emotional and relational sphere. To trigger these behaviors, according to the respondents, in the first place there are curiosity and fun, much higher than the need for money and the belief of winning, more in advanced age groups. About 17% said they play because the game is a common practice in the family sphere. In 2021, 5% of young people fell into the category of frequent players, terms that define those who gamble at least once a week.

Due to the pandemic, most Italian young people have moved to digital platforms, which are now preferred by 1 in 3 players. The global pandemic situation has led to a worsening mood in 65% of young people, some of whom have shown anxiety problems, tensions, and psychological problems [4].

Twitch.tv is an American live-streaming video platform, one of the most successful live streaming websites in the world [5]. The platform was initially designed as a showcase for gamers, public characters who bring, as main content, live streaming in which they play a video game and interact with the 'audience' identified in what is called "the chat, a type of audience active and involved in the show it is attending. Although Twitch is still oriented to propose content such as gameplay (the name of the previously mentioned type of live stream), in recent years the platform has grown to embrace new formats, including talk shows, live music, crafting activities, pool streams, ASMR and, in more recent times, the so-called *slotstreams*, and the vast majority of these have a completely amateur production.

We define *slotstreams* the live streaming contents in which streamers entertain the viewers by gambling on online gambling sites – such as crypto casinos – from which they are usually sponsored for advertising [6].

Throughout the article, we will try to understand if and how viewing such content can be motivating for viewers to engage in gambling behavior.

2. Materials and Methods

2.1. Search Strategies

From July 2022 until the date of submission of the present article (November 2022), we searched the databases of LexisNexis Academic, Business Source Complete, PubMed, Web of Science, Freedom Collection, Health & Medical Collection, Elsevier Journal, Springer, APA PsycARTICLES, Wiley, and single journals for relevant studies performing different searches through different search strings: ((Twitch) OR (Twitch.tv) OR (live streaming)) AND ((gambling) OR (casino) OR (slot)); (psychological mechanism) AND ((gambling) OR (gambling online) OR (internet gambling)); (modeling) AND (social media influencers); (conditioning) AND ((social media influencers) OR (celebrities)).

Electronic searching was supplemented by hand searching the reference lists in the included articles to identify any additional sources.

2.2. Eligibility Criteria

We included every article meeting the following criteria:

(a) All studies and reviews published in indexed journals and indexed in LexisNexis Academic, Business Source Complete, PubMed, Web of Science, Freedom Collection, Health & Medical Collection, Elsevier Journal, Springer, APA PsycARTICLES, Wiley, and other single journals.

(b) Studies related to Twitch.tv, online gambling, gambling disorder, casino online, online slots; modeling; social media influencers; celebrities.

Since this field is still little explored and sources in literature are scarce, also because the article deals with recent events, journalistic sources or deriving from web content are included.

3. Results

3.1. Gambling Disorder

Gambling Disorder (GD) is currently the only disorder unrelated to a substance included in the chapter "Substance-Related and Addictive Disorders" of Section II of the DSM-5-TR [7]. Pathological gambling or gambling disorder is identified as a compulsive behavior towards gambling that impairs the psychosocial functioning of the affected person and causes serious economic, relational, and individual consequences [1]; typical physical symptoms of addiction associated with abstinence are sometimes present, as cold sweats, tremors, headaches, abdominal pain, confusion, insomnia and anorexia [8]. Previously regarded as an impulse control disorder (DSM-IV), gambling disorder was only classified as a behavioral disorder in the latest version of the manual, which currently regards this condition as a genuine addiction disorder [2]. Kardefelt-Winther and colleagues [9] defined *behavioral addiction* as a behavior leading to significant harm or suffering; this behavior is repeated over time and is not controlled by the individual.

3.1.1. Gambling Disorder and personality

What causes this dependence, what characterizes it and how it can be treated are still at the heart of the scientific debate. According to Bergler [10], one of the first to treat gambling disorder, the compulsive gambler presents traits of "psychic masochism", such that the subject actually plays to lose. Custer and colleagues [8] define gambling as a maladaptive coping mechanism that provides relief from psychic pain.

Dell and colleagues [11] have found that there are some personality traits most associated with the risk of developing this disorder. They used Millon Multiaxial Clinical Inventory (MMCI) [12] for the evaluation of traits, which allows the degree and type of pathology to be identified. Among the various personality traits analyzed, it emerged that the manipulation and exploitation behaviors, frequent during the game activity, are an integral part of the personality of the individual regardless of his addiction, as present also ended the activity. It also emerged that compulsive gamblers are less conformist and more impulsive people: this would also explain the incidence of work, family and relational problems associated with most gambling disorder frameworks.

Another interesting data concerns the scores associated with the Drug Abuse Scale, the subscale of the MMCI that measures drug abuse: while in the demographic questionnaires there were no problems related to drug abuse within the entire sample, Drug Abuse Scale did, however, score high on many of the profiles. This indicates that, while participants have responded negatively to questions about substance use, the behaviors that characterize the addict are still largely present in compulsive gamblers: there is, in other words, a personality structure that tends to the development of dependence, regardless of the object of such dependence. The subject with high scores in the DAS, in fact, tends to have difficulty in suppressing impulses and managing the consequences of his behavior [12], which is confirmed by the results of the MMCI.

It is worth noting that there are other disorders that show similarities to substance use disorder and pathological gambling disorder, for which the word addiction is commonly used in non-medical contexts, and the condition currently rich in literature about it is compulsive use of online video games, or Internet Gaming Disorder (IGD).

3.2. Internet Gaming Disorder

Included in the Proposed Criteria, the Internet Gaming Disorder (IGD) is described as a "persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress as indicated by five (or more) of the following in a 12-month period", where the diagnostic criteria largely reflect those typical of substance dependencies, such as "preoccupation with Internet games", "withdrawal symptoms when Internet gaming is taken away" or "loss of interests in previous hobbies and entertainment as a result of, and with the exception of, Internet games" [7]. Similarities between Internet Gaming Disorder and Gambling Disorder are reported

in the DSM-5-TR, although there seems to be a lack of a standard definition of the disorder and a description of some cases, with or without treatment.

3.3. Gambling Disorder, Internet Gaming Disorder and Online Gambling Disorder

GD and IGD have been correlated and analyzed several times for their similarities: it was found that subjects with IGD show higher levels of impulsiveness, while subjects with GD show higher levels of compulsivity [13]; when pathological gambling behavior is implemented online or in video games, we talk about Online Gambling Disorder (OGD) [7] and there are numerous clues that show a positive correlation between the purchase of microtransactions in video games and the IGD or the Online Gambling Disorder [14–19], correlation that most applies to the purchase of loot box – in-game reward systems that can be purchased repeatedly with real money to obtain a random selection of virtual items [14] – rather than other types of microtransactions, as small payments that enable players to obtain additional game content or premiums, e.g. virtual items, textures/skins, currency, levels or power-ups; these types of purchases are common in mobile game revenue models where the base game is 'free-to-play', but the player is encouraged to spend money to make unimpeded progress in the game (i.e. overcome a 'paywall') [14].

The low probability of getting a desired item means that the player will have to buy an indeterminate number of loot boxes to get the item. Loot boxes resemble classic gambling slot machines because they do not require player skills and have a randomly determined outcome [14]. Finally, it has been noted that the risk of Gambling Disorder increases as microtransaction spending increases [20]. One study then found that both subjects with IGD and subjects with GD have worse performance in decision-making than control groups, although IGD subjects still seem to be able to move to more advantageous decision-making processes in the contexts in which they are placed [21].

3.4. Twitch.tv

Twitch.tv is an American live-streaming video platform, one of the most successful live streaming websites in the world. Operated by Twitch Interactive, a subsidiary of Amazon.com, Inc., it was introduced in June 2011 as a spin-off of the Justin.tv gaming-oriented streaming platform. The services and the Justin.tv brand then ceased operations in August 2014 in conjunction with the purchase of the platform by Amazon [5].

Live-streaming – the live broadcast of video content, almost exclusively 'amateur'-produced, over the internet – has also been featured on platforms such as Facebook and YouTube, but it is Twitch that overwhelmingly dominates this space in most of the world. Understood as a form of 'social media entertainment', blurring our understandings of both social media and more traditional broadcast entertainment [22,23], live streaming has become a major source of online media consumption. Originally almost exclusively a site for the broadcast of esports or competitive video game play [24], Twitch has now expanded to house several million broadcasters who regularly live stream their activities on the platform [25].

The platform was initially designed as a showcase for gamers, public characters who bring, as main content, live streamings in which they play a video game and interact with the 'audience' identified in what is called "the chat, a type of audience active and involved in the show it is attending. Although Twitch is still oriented to propose content such as gameplay (the name of the previously mentioned type of live stream), in recent years the platform has grown to embrace new formats, including talk shows, live music, crafting activities, pool streams, ASMR and, in more recent times, the so-called *slotstreams*, and the vast majority of these have a completely amateur production. The popularity of Twitch.tv is surely due to its ability to act as a meeting point between the world of social media and the canonical broadcast systems, such as television [26].

3.4.1. Demographic characteristics of Twitch users

As of 2022, Twitch users are generally adolescents and young adults, with estimates of the percentage of users aged 16-24 between 22.3% [27] and 41% [28–30], predominantly males with estimates ranging from 65% [28–30] to 78.36% [31]. These statistics are confirmed by previous studies [32,33]. Particularly, Cabeza-Ramírez, Muñoz-Fernández and Santos-Roldán [34] found that young males are the most frequent users of video games and live streaming. In detail, older users and female users are more likely to spend less time on video games and live streaming platforms, while the opposite has been observed in younger users and male users, who spend most of their time playing and watching others, are mostly under the age of 19, consider themselves expert players or professionals, use platforms mainly to be informed, and are notable for recording high values associated with bad behavior in networks (e.g., online trolling).

3.4.2. The motivation for Twitch usage

The reasons that lead users to use Twitch are mainly to be entertained (for example, with games owned or games not owned), learn new strategies or gaming techniques and watch a specific streamer [35,36]. Differences between people who spend money on Twitch by making a donation or subscription and those who do not can be determined; regardless of whether participants spent money on Twitch, the main motivation for using the platform is entertainment [35].

A study by Cabeza-Ramírez, Sánchez-Cañizares, Fuentes-García and Santos-Roldán [34] highlighted how playing video games and watching live streaming tend to be two separate things for users, with viewing appearing as more of a complement to gaming, since the intensity with which individuals devote themselves to playing video games far exceeds the time spent viewing or passively engaging in the hobby. Potential adverse effects, continue the authors, could result from the combination of the two activities if the user is not able to properly manage the use of the two media.

3.4.3. Relationship between content creator and viewer

There are several aspects related to the platform that need to be highlighted to give context to this article. First, we must keep in mind that the content brought on the platform, as well as all the content produced and posted on the internet, depends on a small group of "powerful digital platforms", of which Twitch itself is part [37]. This group, which also includes giants such as Google, Apple, Facebook and Amazon itself, governs not only the digital economy, but also the actions of users. Twitch, in particular, is equipped with "a basic architecture designed to govern the possibilities of interaction" [38].

The new era of social media had already seen the approach of users to public characters, canceling the previous 'one-way' communication and opening the path to a greater possibility of interaction (or illusion of interaction) by gradually transforming the role of the public from that of a mere spectator to that of a 'friend' [39]. "Parasocial relationships" – this is how relations between public and celebrities are defined [40] – have been extensively studied in the literature, especially in relation to the use of the internet and social media.

Although amateur, streamers can be considered in all respects celebrities: they have a showcase, a vast audience and a format, elements that allow them, in addition to a gain, even a certain popularity. While recent research has focused on the role of the social media showcase in celebrity endorsement because "they provide a secure and convenient way for celebrities to interact with a large number of fans", it can be assumed that Twitch also performs, for the same reason, a similar function [39].

3.4.4. Population analysis in relation to vulnerability to conditioning and imitation of models and idols

Conditioning represents a highly significant variable in learning and not surprisingly is used in marketing as a sales strategy. Moreover, the use of celebrities as "influential models" is a trend that already covered 20 percent of television advertisements in the 1990s [41] and has nowadays reached the vast majority of online advertisements.

The model that best explains the conditioning dynamic is Scheer and Stern's *influence framework* [42]. According to this model, there are four main stages of influence: (a) the influencer's attempts to influence; (b) the target's attitudinal response; (c) the target's desire to comply; and, finally, (d) the target's behavioral outcomes. Research in associative learning [43] has shown that the positive influence influencers have on their audiences is generated first and foremost on a personal level, starting with physical attractiveness and likability [44].

Scheer and Stern's model does not specify the role that audience characteristics play in varying levels of vulnerability to conditioning. However, we believe that it is not wrong to assume that a segment of the population such as the one prevalent on Twitch.tv is more susceptible to conditioning, especially considering the high percentage of young people who exhibit gambling behaviors.

3.5. The "slotstreams"

We define 'slotstreams' as the live streaming contents in which streamers entertain the public by gambling on online gambling sites – such as crypto casinos – from which they are sponsored for advertising [6]. This type of content, born on Twitch relatively recently, has had and still has ups and downs of popularity, boasting the merit of having reached a peak of over 280,000 simultaneous viewers in late July 2022 [45]. Live streaming based on gambling content is a very controversial phenomenon, hotly discussed even within the same community of Twitch [46] and among the same streamers, which do not fail to point the finger at both those who carry this content, judging them to be "irresponsible" towards their audience, and towards the platform itself, to authorize their airing [47–50].

Because of the strong and constant protests, both from streamers and from users, on 21 September 2022 Twitch issued a statement in which it announced some changes to the rules of the platform regarding content on slots and online casinos, by stating that as of 18 October 2022 it would have prohibited the streaming of sites with gambling that include slot machines, roulette or dice games that do not have a US license or other jurisdictions that provide adequate consumer protection. "We will continue to allow – it reads – sites that deal with sports betting, fantasy-sports, and poker" [51–53].

3.6. Online gambling and slotstream viewing

As we have seen, Twitch's audience consists mainly of young adults and even teenagers [27–33], who represent the most at risk of developing or implementing online gambling behaviors, both pathological and moderate [54]. Online gambling is also associated with psychopathological disorders such as bipolar disorder, particularly in people with hypomanic experiences [55], and young age is significantly associated with bipolarism, especially in subjects with depression [56]. Also, the incidence of depression and anxiety disorders in young adults and adolescents is increasing, due to the recent COVID-19 pandemic [57,58], and male biological sex, which accounts for most Twitch users [34], is another risk factor for gambling, especially pathological [59]. As a result, Twitch viewers are generally statistically inclined to be more likely to gamble, particularly if they suffer from mood or depressive disorders that could further facilitate their fall in gambling to improve their mood [55].

3.7. Persuasive communication and ability to create engagement by influencers

Along with associative learning, a crucial role in conditioning is played by the type of communication with which the message is conveyed. In relation to streamers, influencers, and testimonials in general, the goal is to create engagement that is never an end in itself, and the communication style adopted is persuasive. Indeed, several studies on communication have shown that not only the way the product is presented [60,61], but also the way the source is presented [61] influences the audience's consumption behaviors. Several studies moreover show that audience attractiveness to the product (or behavior) increases if the celebrity advertising it is directly related to the product itself [62]. In relation to *slotstreams*, the streamer is shown gambling himself, spending, winning and losing his own money. He somehow makes himself the first consumer of the product.

4. Discussion

The evidence so far inevitably brings to light several issues. By highlighting the nature of gambling disorder as a behavioral addiction, its relationship to personality components, and its incidence in the population, we aim to hypothesize that there is a relationship between certain variables and the risk of developing pathological gambling in the context of slot-streaming on Twitch.tv. In order to get as close as possible to the features of this platform, we also compared the characteristics of pathological gambling with those of Internet Gaming Disorder and Online Gambling Disorder; we analyzed the main peculiarities of the platform and the users who most populate it. Finally, we considered the two variables that in our opinion most closely combine the topic of gambling as a behavioral addiction and that of gambling as a consumption behavior: the relationship between influencers and audiences and the persuasive communication style as a marketing strategy.

From these premises, the hypotheses that guided the present review are presented below.

Our predictions involve positive correlations between slotstream viewing, problematic psychological symptoms and increased inclination to gamble. In fact, we hypothesize that adolescent subjects with a clinical picture tending toward depression and low self-esteem, frequent or stable condition of social isolation, and greater tendency to emulation may be more vulnerable to the communicative mechanisms of slotstream streamers, and, consequently, more prone to increasingly compulsively search for a "big and easy win" (as shown precisely by the streamers) that can solve all their problems, or at least alleviate them and give them a sense of gratification otherwise absent. As seen in the introduction, out of all Italian adolescents who gamble, about 9% develop a pathology [4]. Therefore, it is not unlikely, in our opinion, to expect that the risk variables we have analyzed can be found within these adolescents.

Another hypothesis or prediction concerns the sample that watches slotstreams but turns out to be devoid of problematic psychosymptomatology: we hypothesize that these individuals are vulnerable to starting gambling based on their tendency to emulate, with results therefore more variable and varied than the first group mentioned above. In general, however, this second group we hypothesize will have a lower propensity than the first group to gamble in relation to slotstream viewing.

The last hypothesis concerns the portion of the sample that does not watch slotstreams on Twitch: we hypothesize a positive correlation between those in this group showing problematic psychosymptom and probable gambling initiation, but without the variable and correlation with slotstream viewing we believe that the odds ratios will be, comparing the groups, lower than the first.

This formulation of hypothesis has some limits. First, it is a hypothesis conducted and structured about a current phenomenon, contextualized on the web and consequently scarce from the point of view of verified or validated references, but rich in online material (including videos uploaded to YouTube, electronic newspaper articles and statistics websites). Moreover, it is a probabilistic and correlational hypothesis that would require

qualitative and quantitative research, for example surveys or structured questionnaires based on validated tools, that have as sample the population in question of this article, the viewers of Twitch.

5. Conclusions

We assume that there is a positive correlation between watching slotstream content and the probability of developing both pathological and non-pathological gambling behavior; it is important to consider and analyze what adolescents and young adults come into contact with daily in order to prevent and treat any falls in addictions, which are becoming increasingly frequent.

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