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Can a 2D shark girl be an influencer? uncovering prevailing archetypes in the virtual entertainer industry

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ABSTRACT

The rise of virtual technology has served as a catalyst for a new influencer model – one with a crafted persona and an animated avatar. These virtual entertainers excel in engaging audiences and have become increasingly popular as a promising industry with many prospective opportunities. However, research within this industry is limited and lacks consistency. This paper aims to establish an emergent theory for the virtual entertainer industry. First, the concept of a virtual entertainer is introduced and defined along with key developments in the evolution of the industry. Using content analysis on 1189 comments and clustering 293 channels with over 180,000 livestreams, the paper identifies 3 key dimensions of virtual entertainers – (1) Organizational Support, (2) Self Expression and (3) Activity; and 5 distinguishing archetypes for virtual entertainers. The performances of these archetypes were compared across multiple success indicators, providing insights for understanding and developing positioning strategies within this growing industry.

1. Introduction

The origins and expansion of the influencer industry can be attributed to the rapidly evolving digital landscape. Each improvement transforms how influencers connect and engage with their audience, allowing them to develop into celebrities of the current era. However, technological advancements in recent years have threatened these existing influencers by allowing a new form of influencer to flourish. These virtual influencers are often computer-generated digital characters that break the mold of the traditional influencer. With no physical bodies, they have no physical limitations and can easily propagate their online presence, generating a huge following and profits simultaneously. For instance, one of the biggest virtual influencers on Instagram, Lu Do Magalu, is estimated to earn over $17 million in sponsored posts in 2022 just from sponsorship posts (Steele, 2022). Firms have acknowledged their influence, and brands from Lenovo to Prada have partnered with these virtual influencers, tapping into their audience base to promote their products (Bringé, 2022). This has been so successful that brands have even developed their own virtual influencers after experiencing the benefits they can bring (Prada, 2021). These virtual influencers have become a global phenomenon, with multiple influencers catering to specific regions and countries while a select few appealing to a broader demographic (Khan, 2022).

Given the importance virtual influencers have in present society, understandably, most research on the subject has focused on how the public consumes virtuality through social media (Miyake, 2022) or how businesses can use avatars to successfully market to, engage, and serve customers (Miao et al., 2022). However, extant research focuses on virtual humans – influencers on social media sites like Instagram who are constructed from computer-generated graphics. These influencers often display high form and behavioral realism, with digital designs and behaviors almost indistinguishable from an actual human. However, the same cannot be said of virtual entertainers – virtual influencers interacting through their content online. Unlike virtual humans, these virtual entertainers have avatars that are not as realistic, many even sporting 2D avatars that are distinctly unrealistic, such as an anthropomorphic cat or a shark girl with cat ears. Even though there is a sizable proportion of virtual entertainers with a largely untapped and growing market worth a projected USD17.4 billion by 2028 (Market Research Guru, 2022), there is a noticeable lack of research on these virtual influencers.

Our paper aims to make four main contributions. First, we provide a standard definition of the term virtual entertainer and integrate these virtual entertainers into the broader virtual influencer sphere. We show how this community is an integral yet distinct segment of virtual

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influencers – one that has developed a viable model that, if successful, virtual influencers can emulate. Second, we explore the history of virtual entertainers and capture important facets of its rapid development, providing insights on possible factors that have shaped the field and ones that have a long-term impact on the industry even in the future. Thirdly, we explore the current state of virtual entertainers and empirically establish various industry archetypes, providing a framework that the field can use to categorize these virtual entertainers. Furthermore, we identify dimensions that impact the formation of these archetypes. Finally, we compare how each of these virtual entertainer archetypes performs on key success indicators and, in doing so, equip practitioners with the necessary information before designing or positioning their virtual entertainer.

2. Virtual influencers in online entertainment

Virtual entertainers are online content creators using a computer-animated avatar as their identity instead of their real self. They stream their content live through platforms like Twitch or YouTube, representing a paradigm shift from the traditionally unidirectional media entertainment options like streaming services producing content to one that is more interactive and often created and consumed in real-time. These computer-animated avatars can emulate the emotions and movements of the content creator through motion-tracking software. They can perform and function like any typical content creator – from livestreaming to producing content, collaborating, and even being on mainstream media. They are more commonly known as virtual YouTubers or VTubers for short. The 2D or 3D avatars that they use to represent their characters can be designed to their specifications, often developing elaborate personas for their character, hiding their real self behind the crafted personality. Since VTubers originated and was popularized in Japan, most of their avatars are animated in Japanese animation style, further enhancing their appeal factor.

With the accessibility of face rigging and motion capture technology, a VTuber can transcend the physical and psychological limitations that real streamers face. The technology behind the phenomenon equalises creators. Physical restrictions that would otherwise affect a real streamer, such as attractiveness, geographical location, and physical health, have no impact on the avatar and crafted persona. For instance, Ironmouse, the top VTuber on Twitch, is essentially bedridden and socially isolated due to a chronic illness but can take on a persona and come into contact with others, making memories by engaging with viewers using her virtual body (Grayson, 2022). Moreover, because of their avatars, VTubers are granted anonymity, a luxury that real streamers will never receive. This gives them the freedom to express themselves without any judgment on their actions or looks, reducing their impact on their real life. This has allowed VTubers to function like any typical streamer or content creator online without the limitations of their physical body or real identities, with a meticulously designed ideal image, both in terms of appearance and personality, that attracts and appeals to viewers.

Audiences of VTubers are motivated to follow these VTubers because of several reasons – (1) avatar appearance, (2) creative content, and (3) engagement and interaction with the VTuber and the community (Lu et al., 2021). As mentioned previously, the appearance and persona of the VTuber can appeal to viewers, leading them to dive deeper into the backstory of the crafted persona, creating elaborate lore that helps viewers maintain a relationship with these virtual entertainers. Similarly, the type of content the VTuber produces can resonate with viewers, especially when they share their personal lives. Audiences found that VTubers' content is markedly more creative than that of real-life streamers, motivating them to continue viewing. Lastly, the VTuber community is tightly knit, and interactions and interpersonal relationships between VTubers add to its appeal. Many viewers form a parasocial relationship, a form of relationship that is one-sided since the viewer forms a connection with the VTuber. However, the VTuber is not aware of the viewer's existence at a personal level (Horton & Wohl, 1956), often engaging with the VTuber during streams through chats and donating to the VTuber as encouragement. These donations are a tangible indicator of how successful the VTuber is while also providing a barometer for the growth of the VTuber industry.

2.1. Deconstructing the streaming process

The impact these VTubers have stems from their primary activity – livestreaming. Livestreaming is a new media content form that allows for real-time interaction between the streamer and the viewer, creating an interpersonal connection even though there is no actual human contact (Wongkitrungreung & Assarut, 2020). It has become increasingly popular since 2011, especially during the COVID-19 pandemic, when it was one of the few viable sources of interaction viewers could get while indoors. Broadcast content varied widely, from e-commerce to gaming to eating and chatting. Viewers will tune in to the streamer's channel to listen to and interact with the streamer and their community.

The streaming process is as follows: The streamer schedules a livestream. The stream notification will appear for all subscribers of the streamer. Once the stream starts, the streamer will start broadcasting their content while viewers tune in to engage with the stream through a chat box on the stream's page. The streamer can view and react to posts by viewers, and viewers can donate to the streamer during the stream if they choose to do so. Streamers may choose to engage more with the viewers by including them in the content being broadcasted, such as inviting viewers into games. As viewers remain anonymous aside from what they disclose on their profile, many choose to actively interact on streams, which builds an emotional connection between the streamer, the viewer, and the community. This parasocial attachment will contribute significantly to the streamer's success.

2.2. The impact of VTubers

Livestreaming is critical to VTubers as it enables them to build a community that will donate money to them during streams. Furthermore, livestreaming provides these virtual entertainers an avenue to obtain clout that may lead to merchandising, sponsorship deals, and other secondary sources of revenue in the future. VTubers have been significantly successful in livestreaming, with audiences growing exponentially. In 2017, VTubers received 16 million views per year on YouTube. However, within a year, views on VTuber content grew to 400 million per year, and by 2022, VTubers were receiving 1.5 billion views every month (Patrick, 2022). Looking at other success indicators, it is clear that VTubers dominate the livestreaming market, as 8 of the top 10 streamers are VTubers, with the top 5 VTubers receiving over USD$12.7 million combined (Playboard, 2022b). Streamers using actual identities have effectively been eclipsed by the rapid growth of the VTuber industry, with several streamers creating their own virtual avatars and embracing the VTuber wave (Chen, 2020). On YouTube, 38 % of the top 300 most profitable channels on YouTube were VTubers (Young, 2022). The rapid expansion of the industry has also demonstrated its lucrativeness. Corporations like Anycolor, the parent company of Nijisanji – a talent agency managing virtual entertainers, brought in over USD $ 21 million in net profit from VTuber activities in just three months (Anycolor, 2022). With a global market size of over USD $ 1.6 billion in 2021 and an estimated compounded annual growth rate of 35.55 % over the next 7 years, the VTuber industry promises to be a profitable enterprise (Market Research Guru, 2022).

From a commercial perspective, VTubers are ideal social media influencers as they are based on a persona and thus are less likely to get into scandals. For instance, VTuber Sakura Miko used a swear in a stream and that moment catapulted her to fame (Miko, 2019). The same swear uttered by a real streamer created backlash for the streamer affecting his channel and his partnerships with companies (McGirt, 2017). Consequently, the VTuber industry has become an attractive

commercialization opportunity for firms. Many such firms have developed partnerships through sponsorships, promotions, brand ambassador deals, and collaborations with VTubers (Anycolor, 2022), with examples being Nissin and the National Tourism Organization (Gordon, 2021). VTubers also function as traditional artists, performing at concerts and releasing CDs (Universal Music Japan, 2022). Some companies, such as Mattel, have created their own personal VTubers to tap into this lucrative market (Lufkin, 2018).

Although the impact of the virtual entertainer industry is evident, this was only possible through a long period of cumulation. To appreciate the factors that were involved in transforming the industry and explore possible dimensions of current prevailing VTuber archetypes, we present the VTuber industry's lifecycle from its inception to its current state in Figs. 1 and 2, detailing key transformative moments within the industry and its influence on audiences and the wider business ecosystem.

3. Conceptual framework

Our conceptual framework is rooted in qualitative evidence and based on key concepts that served as turning points for the virtual entertainer industry through its transition from its emergence to the growth phase. Since our main aim is to identify possible virtual entertainer archetypes, we first use an inductive approach to identify variables of interest within our research. We first conduct content analysis on online forums where VTuber audiences share reasons why they like or dislike particular virtual entertainers. By doing this, we can consider as many variables as possible that audiences use to classify VTubers since previous research has highlighted the benefits of maximizing the number of variables to enhance the richness of our data, especially for novel phenomena (Meyer et al., 1993).

3.1. Data collection for qualitative research

The first phase of our research consisted of identifying possible variables that viewers may use to distinguish between VTubers. To do so, we used the popular online platform Reddit and performed a systematic search on threads pertaining to the reasons why viewers liked or disliked VTubers. Reddit was used as it is the only platform that has virtual entertainer-oriented communities that are unbiased and easily accessible. We used saturation as a methodology to conduct qualitative research (Bonneau et al., 2023). Data was collected on all variables mentioned by community members until data saturation – where similar elements repeatedly emerged with no new elements identified. With 1189 comments over 19 threads, we run a content analysis identifying topics we will use for our classification later.

3.2. Preliminary findings from qualitative research

We found that the potential dimensions that viewers considered fall under four distinct categories – (1) Channel Activity, (2) Streamer Characteristics, (3) Channel Charactertistics, and (4) Support & Resources. We elaborate on each dimension below:

Channel Activity. One major dimension brought up by many viewers focuses on channel activity. Viewers have specified terms such as 'dedication,' 'hard work,' and 'scheduled streams' as important to them. This is evident from previous research as well. Interaction between a viewer and any influencer is driven by the frequency of viewing the influencer's content. These frequent views may, in turn, drive relationships between the viewer and influencer (Kim & Kim, 2021). It stands to reason that the more content the VTuber uploads, the higher the likelihood of interaction since each interaction functions as an opportunity for VTubers to endear themselves or appeal to their viewers. Moreover, activity levels between VTubers can vary, with some VTubers streaming daily while others stream once every few weeks. Presumably, the varying degrees of VTuber activity will serve as a compelling

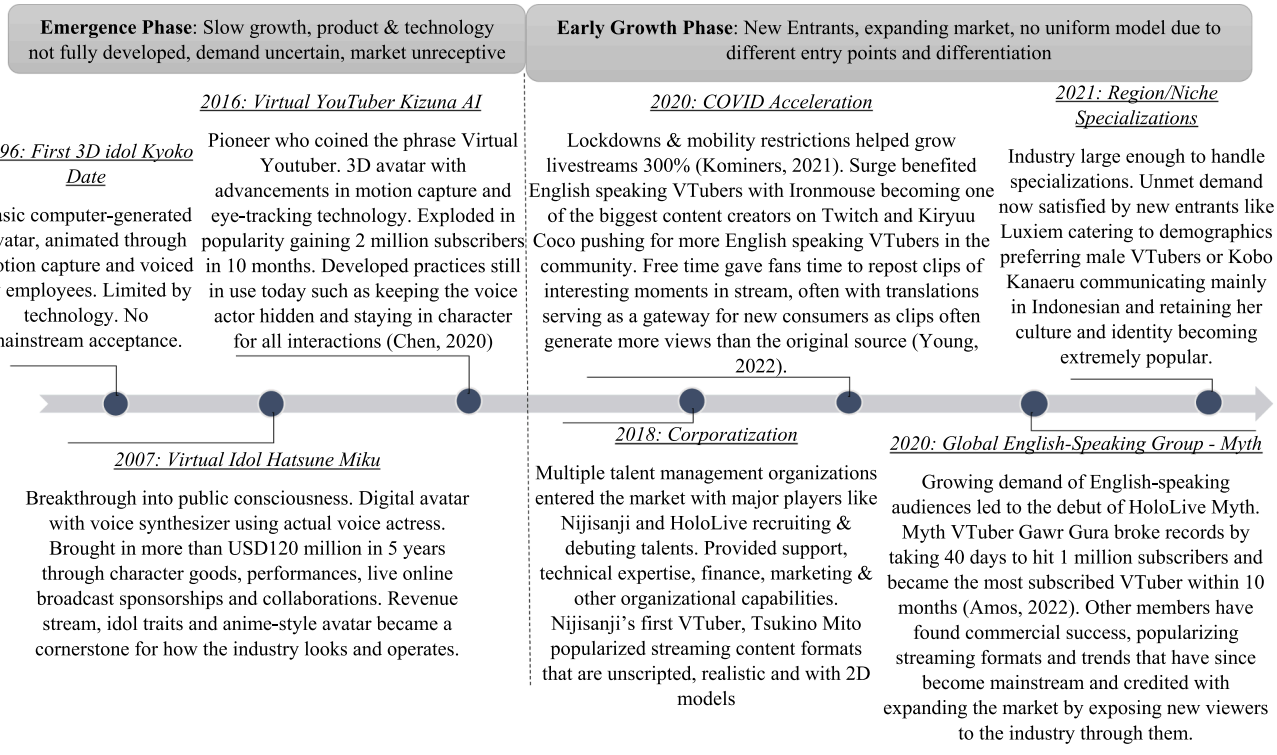

Fig. 1. Key Developments in the Evolution of the Virtual Entertainer Industry (Emergence & Early Growth).

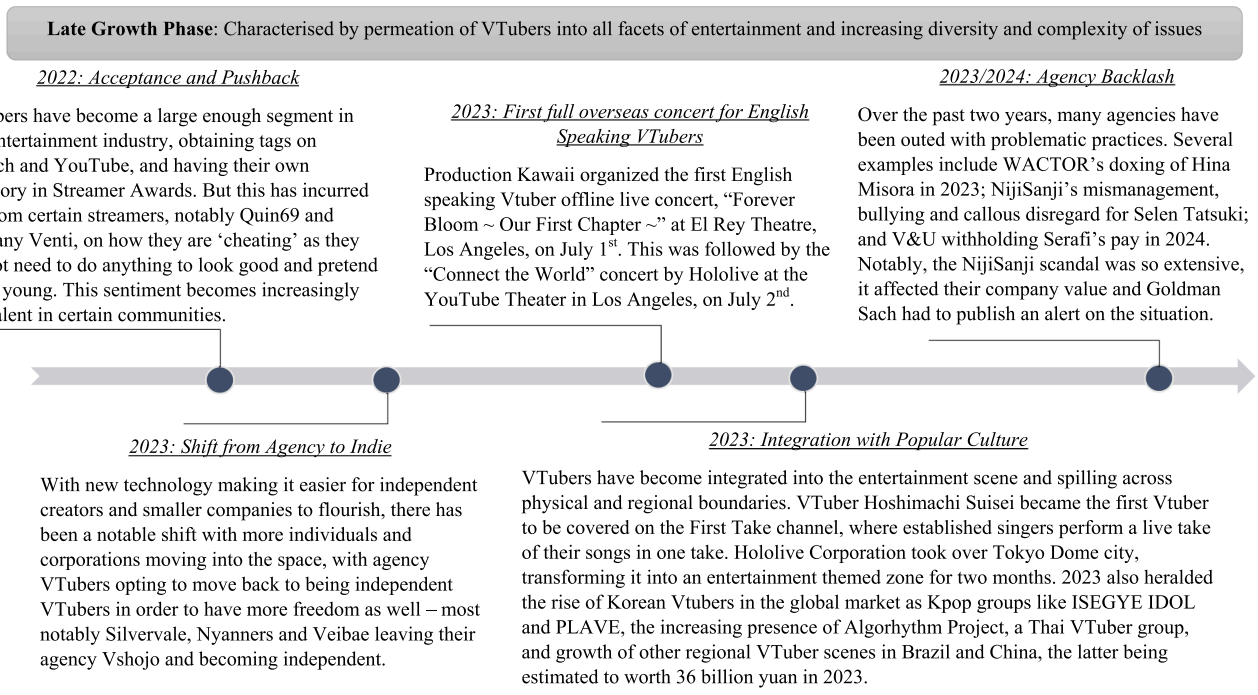

Fig. 2. Key Developments in the Evolution of the Virtual Entertainer Industry (Late Growth).

dimension that audiences will consider.

Streamer Characteristics. Another distinct dimension found pertains to the characteristics of the streamers themselves. Viewers are drawn to their 'pre-fabricated personality,' commenting on 'the visuals' of their avatar, and some even mentioning aspects such as gender by stating that 'Male VTubers are not cute anime girls'; hence they are less likely to watch them. These comments provide evidence that the streamer's characteristic plays an important role in how the audience views VTubers and is reflected in past research too. Critically, Boonchutima and Surakanon's (2023) study reported that avatar design is one critical factor determining whether a viewer would support a VTuber. As Vtubers can quickly generate appeal by relying on the highly specialized coding and character design inherent in otaku culture – a segment of consumers that prefer Japanese popular culture (Galbraith, 2019; Saito, 2011), we consider aspects such as the avatar's dynamism, their background setting, and the gender of the avatar under this dimension.

Channel Characteristics. Our qualitative research also found that viewers judged VTubers based on their content and engagement. Viewers preferred certain forms of content or liked VTubers based on their engagement level with their audience. More polished content, with overlays and title screens, were also listed as a variable of interest. Some viewers also listed realism as one of the traits they were looking for – where the creator is willing to share personal information to make the character feel real. Previous research have also signaled that channel characteristics as an important dimension. Borchers (2019) notes that influencers operate in a medium that allows for various communicative strategies and approaches between the influencer or content creator and their audience. They need to generate appealing content catered to the audience's interests while remaining approachable and giving a distinct identity (Borchers, 2019). For example, Jacobson and Harrison (2022) note that sustainability-focused fashion influencers carefully calibrate their personas and content to adhere to shifting audience demands – which often interferes with the influencer's ability to locate sponsors.

Similarly, many VTubers assimilated streamer traits in their character, positioning themselves as virtual streamers instead of a virtual idol. Although both forms of VTubers produce content and engage with fans, streamers produce distinctly more interactive content, such as gameplay, and leverage their persona and openness, such as sharing personal details, to foster a closer relationship with the viewer. Thus, streamers embody transparent authenticity, a concept where the influencer discloses information truthfully about the brand, in this case, themselves (Audrezet et al., 2020). In comparison, idols present themselves differently, producing music videos and other forms of content that portray a pristine public image. Therefore, Vtubers who craft their channel and content methodically have an additional tool that allows them to strategically manipulate the existing consumer base and adapt to audience expectations and demand.

Organizational Support & Resources. An alternative source of differentiation between VTubers is the amount of institutional support and resources they receive. Certain VTubers have companies backing their activities. These companies offer various resources and support, from technical to promotional help, that may allow a VTuber to break out of the crowd. The main reason for a VTuber's decision to join a company is the networks they have. Most companies have an established reputation, often built through the successes of their talents. This network can be tapped by new VTubers joining the company, providing them a substantial boost to their initial viewers. They can also collaborate with other VTubers within the company to easily grow their viewership. Furthermore, companies provide other benefits ranging from an in-house production team to help craft their backstories and illustrations, technical support on 2D and 3D streaming using various devices, and even support on activities that can generate secondary sources of income, including the organization of live events, creation and sale of merchandise, sponsorships, and advertisements, and production and sale of music (Anycolor, 2022). We found that some viewers prefer VTubers from larger companies, stating reasons such as the capacity for crossover collaborations and promotions through other media such as games and how there are resources to market VTubers associated with companies. Other viewers support independent VTubers because they prefer an 'exclusive small fanbase.' As such, organizational support and resources available to VTubers may serve as a meaningful differentiator of VTuber archetypes. VTubers affiliated with large virtual entertainer agencies will have resources and support that allow them to operate smoothly. Conversely, those from smaller agencies may be limited, both in terms of resources and support, and thus may not

function as effectively. Independent VTubers with no organizational support may have their content quality affected and their growth restricted due to a lack of foundation.

4. Data & measures

We chose to extract information on virtual entertainers from YouTube. Although virtual entertainers can be found on platforms like YouTube and Twitch, this phenomenon has become particularly synonymous in the YouTube sphere with these content creators termed VTubers. YouTube offers VTubers a space to not only upload their videos but also livestream their content. Furthermore, VTubers can receive revenue in the form of viewer contributions as well as video monetization through advertisements.

4.1. Data collection for empirical research

To identify a list of VTuber channels on YouTube, we used Playboard, a data aggregator website for YouTube. Playboard collects data from YouTube channels with over 1,000 subscribers and over 1 million views (Playboard, 2022a). We use Playboard because it has two critical advantages over other data sources. First, the site collects statistics on videos and streams on over 12 million registered channels. Playboard is one of the few data sources providing information on livestream statistics, such as the number of viewers and contributions at any time during the livestream. This allows us to capture historically accurate data for each livestream that the VTuber has. Second, unlike YouTube or other platforms that utilize YouTube's categorization methods, Playboard has a subcategory specifically for VTubers. We rely on this classification to quickly identify VTuber channels for our research sample, obtaining a list of 300 VTuber channels.

After extracting our list of VTubers, we accessed each VTuber's YouTube channel to collect further information about the VTuber. We excluded 7 channels that have been deleted or had all videos removed due to voluntary or involuntary discontinuation of their activities. Our sampling process resulted in 293 channels we used in our study, with each channel having, on average, 716 videos and 618 livestreams. To discern any shared characteristics that these VTubers may have, we examine each video, noting down characteristics that appear in a majority of these livestreams and videos to distinguish each VTuber's characteristics. We describe these channel properties in the following section.

4.2. Data Description

Table 1 provides a summary of the variables that we capture for our research. We categorize these variables according to the attribute being captured, notably (1) Channel Activity, (2) Streamer Characteristics, (3) Channel Characteristics, (4) Resources available to the streamer, and (5) Stream Outcomes.

Channel Activity. The first set of measures we collect revolves around the VTuber's activity on the channel. There are three types of data we collect – (1) information relating to video uploads, (2) information on streams, and (3) how long the VTuber has been active. We gather the total number of videos and streams to gauge VTuber's productivity. We also appraise their weekly streams and uploads, acquiring figures on how relatively active they have been per week. The aggregate data can be found on Playboard or tabulated by accessing the VTuber's channel. Finally, how long the VTuber has been active is a measure of their experience and the length of time they have been in this industry. We procure this by identifying the date the YouTube channel was created and computing the number of days the VTuber has been active.

Streamer Characteristics. The VTuber's personal characteristics, traits that identify them as an idol or a streamer may also trigger differentiation between VTubers. The use of the avatar, the background, and the streamer's gender may be used by viewers as important factors that can distinguish VTubers too. Consequently, we code three variables – (1) Avatar Dynamism, (2) Setting, and (3) Gender. Avatar Dynamism represents how fluid the movements of the avatar can get.

There are 5 different levels of dynamism that we code VTuber's avatars on. The avatar can be static, a png file with no movements. It can be semi-static, where the entire avatar can only move from side to side but nothing else moves. Avatars can have eye-tracking capabilities where the mouth and eyes move along with the body. More dynamic avatars have a multi-directional rotation where movement is less constrained, and even hair, clothes, and ornaments move. Finally, 3D avatars with

Table 1
Summary of Variables.

Category	Measures	Sources	Mean	S.D.
Channel Activity	Total Videos	Playboard	716.3	456.21
	No. of Weekly Videos	Playboard	4.99	3.23
	No. of Streams	Playboard	618.28	384.10
	Avg. Weekly Streams	Playboard	4.41	2.63
	Days Active	Channel	1149.67	612.78
Streamer Characteristics	Avatar Dynamism	Videos	4.48	0.83
	Setting	Videos	3.80	0.58
	Gender: Female	Channel	0.78	0.41
Channel Characteristics	Content Consistency	Channel	0.68	0.35
	Content: Gameplay	Channel	0.75	0.43
	Content: Tutorial	Channel	0.01	0.12
	Content: Reviews	Channel	0.003	0.06
	Content: Sketches	Channel	0.003	0.06
	Content: Vlogs	Channel	0.003	0.06
	Content: Music Videos	Channel	0.09	0.29
	Content: Chats	Channel	0.10	0.30
	Content: ASMR	Channel	0.03	0.16
	Engagement Levels	Videos	1.66	0.52
	Thumbnail: Art	Channel	0.53	0.50
	Thumbnail: Sketch	Channel	0.39	0.49
	Thumbnail: Screen	Channel	0.01	0.10
	Thumbnail: Avatar	Channel	0.06	0.25
	Thumbnail: Content	Channel	0.01	0.12
	No. of Title Screens	Channel	2.46	0.67
	Audience Participation	Videos	3.59	1.35
	Personal Disclosure	Videos	0.52	0.50
Support & Resources	Company: Independent	Channel	0.22	0.41
	Company: Big	Channel	0.57	0.50
	Company: Small	Channel	0.21	0.41
	Promotion Videos	Playboard	6.16	8.79
Stream Outcomes	Subscribers	Playboard	415,560	451,972
	Total Views	Playboard	54,731,108	72,339,492
	Avg. Video Views	Playboard	81,404	139,188
	Like Rate	Playboard	0.08	0.05
	Comment Rate	Playboard	0.001	0.002
	Max. viewers in Stream	Playboard	14,869	33,863
	Avg. viewers in Stream	Playboard	4337	7914
	SuperChat Amount	Playboard	315,394	385,514
	No. of SuperChats	Playboard	30,681	42,899

full body tracking and positioning are exceedingly dynamic. As VTubers can have a wide variety of avatars, the avatar they use most frequently throughout their channel will serve as the basis for the avatar dynamism of the channel. With Settings, we code the most frequent background used for the VTuber's streams. Settings have 4 levels ranging from simple to more complex ones. Having an empty backdrop or screen is the lowest level of setting a stream can have. Streams can also be held with a basic background, such as a simple desk mostly unadorned, a more elaborate background with an entire room designed much like a set, and a dynamic background that changes depending on what the VTuber wants to show. The setting can function as a signature for the VTuber and may also be an important feature. Finally, the gender of the streamer may also impact how viewers regard these avatars. We code the gender of these VTubers as part of the streamer's characteristics.

Channel Characteristics. We capture several distinctive attributes of channels in our research as they may also serve as indicators of different developmental paths between an idol and a streamer. These attributes revolve around various aspects relating to their content. They include content consistency, content type, engagement levels, thumbnail choices, title screens, audience participation within the content, and levels of personal disclosure during streams. Content consistency measures the proportion of the most common content type produced by the channel relative to all other videos produced by the channel over the past year. A channel with lower consistency indicates that the VTuber explores different content.

In comparison, those with higher consistency tend to be VTubers pigeonholed into a particular content category, such as gaming VTubers. Content type identifies the main type of content the VTuber produces – gameplay videos, tutorial videos, product reviews, short sketches (stories or comedy routines), vlogs (video logs of daily life), music videos, chats (or podcasts with guests) and ASMR videos (auditory stimuli that can trigger sensations). With engagement levels, we observe whether the typical interaction on the channel is one-way or two-way. One-way interaction generally involves the VTuber involving themselves in the content with little or no interaction with the viewers. Two-way interaction involves the VTuber engaging in a conversation with viewers. We gauge this from the videos and streams released over the past year. Since a viewer is first exposed to thumbnails of videos and streams when they enter the channel, the form these thumbnails take is also recorded.

We categorize thumbnails into 5 types: artwork, sketches, screengrabs, avatar overlays, and stream screens. Artwork includes images created for the stream, often with colors; sketches are rougher images with less detail and often in black and white; screengrabs include images of the content that is streamed, such as gameplay footage, an avatar overlay is an image with their VTuber's avatar featured prominently in a particular pose, and stream screens show both the screengrab as well as the avatar in the corner of the image that functions as a screenshot of the stream itself. The title screen is what appears before the start of the stream. Viewers can tune in to the stream once the streaming page is open. We document how these streams start. Channels with a blank screen or ones that transition immediately into the stream are coded as having no title screens. Channels with a single title screen that does not change over a year are considered to have a singular title screen. Channels with title screens that change multiple times throughout the year are classified as having multiple title screens.

Finally, our last attribute concerns the limits of audience participation on the channel. In the channel's engagement level attribute, we measured how frequently they interacted with the audience. In the audience participation attribute, we are interested in how the channel encourages audience participation. In the last year of content produced by the channel, we determine streams with the highest amount of audience participation and code the level of participation on them.

To ensure that the stream is not an isolated outlier, we require the same level of audience participation to happen across at least 3 streams. We also used a yardstick of 1 % instead of 3 streams as a sensitivity check, which did not affect our subsequent results. We coded the level of participation over 5 different levels – (1) no interaction at all with VTubers either focused on their content or other collaborators and not their audience, (2) reactive interactions where audience participation tends to occur only when the VTuber reads out names of donators to the stream, (3) Interaction with the chat content where VTubers will mention or reply to the actual content posted within the chat, (4) utilizing suggestions from viewers resulting in an actual change in the content because of the viewers, and (5) inviting viewers into games or initiating question and answer sessions with the audience. Each level captures increasing degrees of interaction on the part of the audience, capturing the furthest the VTuber included the audience in the stream. Finally, we also collect information on the extent to which the VTuber discloses personal information. We code this according to whether the VTuber shares their life experiences during the stream. Channels with discussions of daily life experiences or family and friends outside of the VTuber sphere are all considered personal disclosure. Channels that maintain the fantasy by building on the VTuber's persona and setting without divulging non-VTuber-related information are coded as having no personal disclosures.

Resources. We use the organization behind the VTuber as a proxy for their available resources. VTubers belonging to large corporations will have higher organizational support and resources that they can utilize compared to VTubers with smaller institutions behind them. We coded the presence of an organization behind the Vtuber, defining the organization as big or small. VTubers that belong to no organization and thus ostensibly have no access to resources are labeled as independent. We characterize big companies as corporations that can meet one of the three criteria – (1) they have gone through an Initial Public Offering (IPO), (2) they have gone through funding rounds of at least USD 5 million, or (3) they have at least 10 talents and have a net income of over USD 1 million a year. The criteria imposed ensure these companies have the resources and organizational structure to support the VTuber. IPOs are a signal of success for a firm as the firm is now large enough that many investors are interested in owning a part of the firm. The fact that the business filed for an IPO indicates that the firm has become significant enough in the industry (Aggarwal & Hsu, 2014).

Similarly, large venture firms tend to offer the average seed funding amount of USD 4.6 million (Teare, 2021). As such, if a firm receives $5 million in funding from investors, the firm is likely to be large, too. Our final yardstick deals with the current activities of the company. If we cannot verify the first two criteria, we will use the number of VTubers the company has and its annual earnings to separate large firms from smaller ones. Companies that fail to meet these standards are deemed small companies. We utilize IPO listing databases and Crunchbase, a corporation database, to evaluate each VTuber's corporation. Using this as a basis to identify big companies, we end up with three corporations – (1) AnyColor with an IPO in 2022 (IPOkiso, 2022a), (2) COVER Corporation with $8.7 million in funding (Crunchbase, 2022a) with over 71 VTubers generating more than $1 million in terms of revenue (IPOkiso, 2022b), and (3) VShojo with $11 million in funding (Crunchbase, 2022b). Another variable that we are interested in is the number of promotion videos the VTuber has on their channel. Promotion videos are paid sponsorships with external companies, with companies paying VTubers a sum of money to advertise their products on the video. The more promotion videos the VTuber has, their access to resources increases. We collect this data by tabulating all sponsored videos identified by the video's 'paid promotion' tag in the VTuber's channel.

Stream Outcomes (Video Results). To evaluate how our resulting archetypes perform across meaningful stream outcomes, we collect stream metrics from the channel's past videos and livestreams. We obtained information related to the number of subscribers the VTuber's channel has, the total number of views of all videos on the channel, and the average number of video views the channel has for the last 30 videos. These metrics capture the health of the YouTube channel, providing us with an understanding of how much traction the channel tends to get.

Subscribers capture the number of viewers who are subscribed to the channel. These viewers tend to be interested in the VTuber's content and would like to be reminded each time the VTuber streams or posts new content. The number of views captures the attention the VTuber's content receives. VTubers tend to archive livestreams on their channels so that viewers unable to watch the stream live can peruse it at their own leisure. Higher views signify a wider audience base since more consumers are viewing the VTuber's content.

Finally, we are interested in the current situation of the channel. Specific channels may have once been popular in the past but may have stagnated in recent years, and our first two metrics will not be able to capture how the channel is currently performing. To account for this possibility, we calculate the average number of views based on the last 30 videos on the channel. This would allow us to discern how the channel has been performing for the recent 1.5 months as channels upload 2 videos every 3 days on average in our sample. As these values can vary a lot with exponentially large numbers, for our analyses, we will log transform the data.

Stream Outcomes (Channel Results). Aside from video statistics, we are interested in outcomes concerning how viewers tend to react to a channel's content. We record two relevant ratios on different levels of viewer engagement. The first ratio is the Like rate, the ratio of video views to likes. Likes are a non-effortful, passive, positive indicator that viewers can use to give feedback to the channel creator. The more likes there are on a video, the higher the positive sentiment viewers have of the video. The second ratio is the Comment rate of video views to comments. Comments involve the viewer since they must put in the effort to generate a comment. Comments are a form of user engagement distinct from Likes and exist at two different levels (Peters et al., 2013). Viewers who comment are more active than viewers who merely like a video. Both levels of user engagement are captured at a channel level across all uploaded videos for our analyses.

Stream Outcomes (Livestream Results). For stream-specific outcomes, we capture data pertaining to the viewers on the livestream and details on SuperChat contributions. Regarding viewers in the livestreams, we develop two separate metrics – one observation focusing on the peak point of recent livestreams and one observation targeting the average number of viewers that recent livestreams draw in. To account for the recency of data, we only focus on the past 15 livestreams for both these metrics. This allows us to identify how well the channel's livestreams have currently performed in the past month, as channels livestream once every two days on average in our sample. The maximum viewers in stream capture the highest number of concurrent viewers watching the livestreams of the channel for the past 15 livestreams, verifying the channel's peak number of viewers at any given time. The average viewers in the stream capture the number of concurrent viewers watching the channel's livestream across the past 15 streams. With SuperChats, we used the SuperChat amount and the number of SuperChats the channel received. These indicators allow us to quantify the performance of these channels' streams using monetary value. Much like our video results, we log transform our data here to deal with exponentially large values.

4.3. Methods

We use channel activity, streamer characteristics, channel characteristics, and availability of resources as dimensions of the VTuber that we will run our cluster analysis on. We exclude stream outcomes since these are determinants driven by the VTuber's success and are not exogenous. We run a cluster analysis of the remaining variables after considering the measure of similarity that should be used and identifying cluster solutions. Cluster analysis is a common tool for developing empirical groupings of similar segments and has been deployed as a classification tool across multiple streams of research (Punj & Stewart, 1983). Cluster analysis makes no assumptions about differences within any population and uses data to empirically classify observations into groups (Gerard, 1957). This unbiased method has been used to develop taxonomies for consumers (Bettman, 1979), corporations (Ketchen & Shook, 1996), and even products (Srivastava et al., 1981) and is considered to be econometrically appropriate even in instances with large data (Fisher, 1969).

We empirically establish the number of clusters and the cluster membership of each channel using Gower's Distance (Gower, 1971). Unlike traditional clustering methods using Euclidian distance (Punj & Stewart, 1983) or a range-normalized Manhattan distance measure (Gower & Legendre, 1986) to compute similarity in quantitative data, Gower's distance has been used in clustering mixed-type observations:

$$d_{i,j} = 1 - s_{i,j}$$

measuring the distance between the unit i and j with $s_{i,j}$ being the similarity measure between unit i and j (Gower & Legendre, 1986). For each variable type, a different distance metric will be used. This metric will be scaled to fall between 0 and 1 before the final distance matrix will be calculated based on the average score obtained. When dealing with categorical variables, Gower's distance uses the Dice measure to compute similarity, comparing the match and mismatch between the observations. If observation x_i and x_j match, they are similar and assigned a 1. If the observations do not match, they are assigned a 0. The co-occurrence proportion is then constructed to identify similarity (Dice, 1945). The flexibility of Gower's distance allows for easy measurements of similarity regardless of the type of variables and is hence widely used for mixed-type observations.

After calculating the distance matrix, we partition our data around medoids (Kaufman & Rousseeuw, 1990). This iterative procedure is similar to the k-means clustering algorithm with one notable exception, the cluster centers are based off observations instead of centroids. As k-means clustering has been found to be the simplest and most efficient method for clustering, we replicate this methodology (Steinley & Brusco, 2008). The algorithm identifies k random observations as medoids and assigns each observation to its closest medoid. If there are observations that can lower the average distance if they are assigned as the medoid, the algorithm will refine the clusters by recalculating the assignments again until average distance between observations is at its minimum. The iterative partitioning methods have been seen to perform better compared to other methods of cluster identification (Punj & Stewart, 1983). We assign the data points to the closest medoid using the objective function:

$$J = \sum_{j=1}^{k} \sum_{i=1}^{n} \left\| x_i^{(j)} - m_j \right\|^2$$

where k is the number of clusters, n is the number of observations, $x_i^{(j)}$ is case i to be included in cluster j and m_j is the medoid for cluster j. We then minimize the sum of squared distance between updating cluster assignments. Finally, we recompute the medoids after cluster assignments in the previous iteration. We will repeat this procedure until there is no further change in the cluster assignment (Howard & Harris, 1966).

5. Results

After establishing each channel's membership, we provide a summary of the clusters.

In Table 2, it is clear that three distinguishing characteristics can be used to differentiate these archetypes – (1) the level of organizational support & resources, (2) the level of self-expression afforded to the VTuber, and (3) the VTuber's activity levels. These dimensions enable easy classification of our archetypes. Organizational support reflects the size of the organization supporting them, whether these organizations are large corporations, simple corporations or even an absence in corporate support. The capacity for the VTuber to express themselves also distinguishes the physical model these VTuber's use. VTubers with

Table 2
Cluster Mean Summaries.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
No. of Members	94	53	38	82	26
Channel Activity					
Total Videos	654.8	738.9	837.7	771.4	541.7
No. of Weekly Videos	4.33	5.49	5.53	5.48	4.04
No. of Streams	591.6	566.2	693.8	697	462.5
Avg. Weekly Streams	3.94	4.62	5.11	4.78	3.46
Days Active	1036	1422	1231.7	1086	1085.7
Streamer Characteristics					
Avatar Dynamism	4.72	4.08	4.13	4.71	4.27
Setting	3.85	3.70	3.82	4	3.12
Gender: Female	0.80	0.81	0.84	0.66	1
Channel Characteristics					
Content Consistency	0.63	0.77	0.69	0.7	0.61
Content: Gameplay	0.83	0.6	0.71	1	0.08
Content: Tutorial	0	0.04	0.03	0	0.04
Content: Reviews	0	0	0.03	0	0
Content: Sketches	0	0.02	0	0	0
Content: Vlogs	0	0.02	0	0	0
Content: Music Videos	0.04	0.11	0.05	0	0.58
Content: Chats	0.11	0.19	0.08	0	0.27
Content: ASMR	0.02	0.02	0.11	0	0.04
Engagement Levels	1.76	1.62	1.34	1.7	1.73
Thumbnail: Art	0.94	0.64	0.79	0	0.08
Thumbnail: Sketch	0	0.15	0.16	0.93	0.88
Thumbnail: Screen	0	0.04	0	0	0.04
Thumbnail: Avatar	0.06	0.15	0.03	0.05	0
Thumbnail: Content	0	0.02	0.03	0.02	0
No. of Title Screens	2.62	2.34	2.24	2.42	2.65
Audience Participation	3.85	3.57	3.03	3.46	3.96
Personal Disclosure	0.64	0.26	0.16	0.7	0.62
Support & Resources					
Company: Independent	0	1	0	0.06	0.23
Company: Big	0.95	0	0.08	0.9	0.08
Company: Small	0.05	0	0.92	0.04	0.68
Promotion Videos	7.80	4.09	5.26	7.71	0.92
Stream Outcomes					
Subscribers	537,323	142,712	186,676	637,320	166,654
Total Views	64,279,406	27,678,009	33,966,638	81,234,007	22,119,049
Avg. Video Views	120,420	28,038	32,167	110,295	29,982
Like Rate	0.07	0.08	0.09	0.07	0.11
Comment rate	0.001	0.002	0.002	0.001	0.002
Max. viewers in Stream	24,362	4701	4617	19,125	2834.8
Avg. viewers in Stream	6412	1607	1480.3	6110	983
SuperChat Amount	394,842	131,899	178,579	467,311	123,044
No. of SuperChats	39,294	14,410	17,815	41,828	15,270

curated personas model themselves after idol culture where every aspect of their image needs to be polished and controlled, with little space for self-expression. VTubers, on the other end of the self-expression dimension, style themselves after streamers, coming across as more relatable and genuine. Finally, activity levels directly measure VTuber's activity in streaming and creating content. Active VTubers stream and publish new content frequently. We illustrate these five clusters across these dimensions in Fig. 3 in greater detail below.

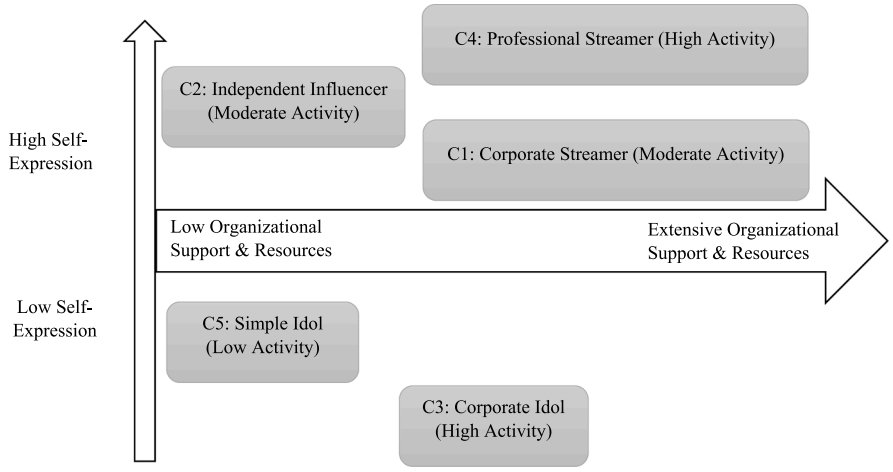

Fig. 3. Map of Clusters across Three Key Dimensions.

Extensive Organizational Support, Moderate/High Self-Expression & Moderate Levels of Activity – The Corporate Streamer. These VTubers are commercial streamers created by companies. VTubers in Cluster 1 are able to get substantial amounts of resources and organizational support, as 95 % of them belong to large corporations. Given the large amounts of support, they can develop a better streaming environment, such as utilizing avatars with high levels of dynamism and better streaming backgrounds. They can obtain resources to develop multiple title screens and have more polished artwork as thumbnails.

With the backing of a corporation, Corporate Streamers aim to generate profits for the business and thus are encouraged to engage with the audience to build a following. This cluster models itself after streamers, with high levels of engagement and audience participation; however, they have lower levels of personal disclosure compared to professional streamers with less corporate oversight. Hence self-expression in this cluster is generally high but controlled to a certain extent. Furthermore, unlike most other clusters, Corporate Streamers generate fewer videos and streams due to their commercial nature. Corporate control may dictate specific timetables they are required to follow or other restrictions that require approval from corporate, affecting their ability to produce content quickly. This has resulted in Corporate Streamers distinguishing itself by being the lowest streaming cluster in terms of productivity.

Moderate Organizational Support, Low Self-Expression & High Levels of Activity– The Corporate Idol. Corporate Idols are VTubers that enjoy high organizational support but are molded by their respective companies to embody a professional idol. 92 % of these VTubers are signed on to small companies, with only 8 % belonging to larger corporations. As such, they receive moderate levels of resources and organizational support. These VTubers are extremely active, producing the most videos and streams on average across all 5 clusters. However, their streams are typical of idol culture, maintaining an image that sets them apart from their audience, with substantially lower levels of disclosure, engagement, and audience participation than any other cluster. The low levels of self-expression coupled with high activity set them apart from their counterpart, the simple idol.

Extensive Organizational Support, High Self-Expression & High Levels of Activity – The Professional Streamer. We label cluster 4 as Professional Streamers due to their similarities with typical streamers. Like Corporate Streamers, these streamers tend to come from larger organizations and have higher levels of support and resources that can help them succeed. This is shown in the stream resources available to them, such as the extensive backgrounds they have during streams or well-designed avatars with high levels of dynamism. Professional streamers disclose more personal information than any other cluster but have less engagement than Corporate streamers; this may be partly due to the content they produce. Professional streamers exclusively stream gameplay, with more male avatars used compared to the other clusters. The high levels of disclosure and the use of sketch thumbnails come across as more relatable and more genuine than clusters that model themselves after idols or ones that corporations obviously control. Unlike Corporate streamers, that may have other non-stream corporate activities to carry out and thus may affect their content production, these VTubers are focused on streaming, being exceptionally active, and producing large amounts of content.

Low Organizational Support, Moderate Self-Expression & Low Levels of Activity– The Simple Idol. Cluster 5 represents the smallest group of virtual entertainers in our sample. This cluster is characterized by little organizational support as 68 % of VTubers in this cluster are from small companies, while the remaining 23 % are independent. As such, the resources available to the VTuber is limited. Furthermore, unlike other clusters where sponsorships are common, this cluster has almost no promotional videos, with each channel having less than 1 promotional video on average.

Furthermore, the thumbnails on the channel tend to be dominated by sketches which allude to a possible resource constraint. On the dimension of self-expression, the VTubers in this cluster exhibits traits similar to a typical idol celebrity. VTubers in this cluster are overwhelmingly female and produce mainly music videos. However, unlike Corporate Idols, where management is clear on their positioning as a commercial idol, these VTubers try to reach out to their audience by having the highest audience participation on their streams compared to the other 4 clusters, demonstrating a moderate level of self-expression. Compared to other clusters, VTubers here have simpler streaming backgrounds and are less active, producing less videos and streams.

Low Organizational Support, High Self-Expression & Moderate Levels of Activity – The Independent Influencer. Cluster 2 represents the independent entertainer. These VTubers can be easily distinguished through their lack of organizational support. VTubers in this cluster is independent VTubers. The lack of organizational support is also reflected in their low number of sponsored videos. Without any organizational support, these VTubers may encounter a resource deficit and cannot spend money on better streaming resources. This is reflected in their avatars and backgrounds, having the least dynamic avatars and having simpler stream settings compared to most other clusters. VTubers in this cluster can express themselves, with different VTubers engaging themselves in their niche, covering a wide variety of content, but each producing content consistent with their niche. These VTubers produce less content than Professional streamers but more than Corporate streamers, do not engage with the audience or disclose personal information as much as other streamer counterparts. Table 3 provides a summary of the key traits of each archetype.

5.1. ANOVA analysis and post-hoc tests

To further understand the differences within each cluster, we investigate how each cluster performs on varying stream outcomes using an ANOVA test. As these stream outcomes are a consequence of various characteristics and choices made by the VTuber, it is appropriate that we compare stream outcomes across each cluster. We run a post-hoc Tukey HSD test to supplement our analysis with pairwise comparisons for each cluster. This allows us to identify statistically significant differences

Table 3
Cluster Labels & Description.

Clusters	Cluster Description	Cluster Labels
1	• VTuber in a Big Company • High organizational support – multiple title screens and artwork as thumbnails • High audience participation	Corporate Streamer
2	• Independent VTuber not tied to a company • High content consistency • Little dynamism in avatar	Independent Influencer
3	• VTuber in a small Company • Very little personal disclosure • Low engagement levels • High activity in terms of large numbers of produced videos and weekly streams	Corporate Idol
4	• VTuber in a big company • Highly active in streaming & creating content High personal disclosure Mainly utilizing sketches as thumbnails • Typical Streamer profile with mainly gameplay • videos and a higher number of guy avatars compared to other clusters	Professional Streamer
5	• Small or Independent VTuber • Few promotion/sponsored videos • Some organizational support – multiple title screens, Sketches as thumbnails, music video production • Typical artiste profile – female, less videos, less focus on background, fewer videos focused on music videos • High audience participation	Simple Idol

between clusters. We summarize the results of our post-hoc tests in Table 4. Testing each cluster against the others in multiple pairwise comparisons, we found noticeable significant differences.

Specifically, Corporate streamers (Cluster 1) and Professional Streamers (Cluster 4) are distinctly different from the other three clusters for all stream outcomes aside from one exception. Comparing Subscriber numbers, the clusters are significantly different (F=48.08, $p < 0.01$), with Corporate streamers having more subscribers than Independent influencers ($M_d = 1.67$, $p < 0.01$), Corporate idols ($M_d = 1.22$, $p < 0.01$) and Simple idols ($M_d = 1.31$, $p < 0.01$). Professional streamers also outperform Independent influencers ($M_d = 1.74$, $p < 0.01$), Corporate idols ($M_d = 1.28$, $p < 0.01$) and Simple idols ($M_d = 1.38$, $p < 0.01$) as well. This result is replicated for the total number of views the channel has too (F=24.24, $p < 0.01$), with Corporate streamers having more views compared to Independent influencers ($M_d = 1.68$, $p < 0.01$), Corporate idols ($M_d = 1.13$, $p < 0.01$) and Simple idols ($M_d = 1.43$, $p < 0.01$). In contrast, Professional streamers are able to obtain a greater number of views unlike Independent influencers ($M_d = 1.81$, $p < 0.01$), Corporate idols ($M_d = 1.26$, $p < 0.01$) and Simple idols ($M_d = 1.56$, $p < 0.01$). We observe the same pattern for average video views of content within the channel (F=33.1, $p < 0.01$). The average number of video views is larger for Corporate streamers than Independent influencers ($M_d = 2.02$, $p < 0.01$), Corporate idols ($M_d = 1.44$, $p < 0.01$) and Simple idols ($M_d = 1.58$, $p < 0.01$). It is also larger for Professional streamers unlike Independent influencers ($M_d = 2.00$, $p < 0.01$), Corporate idols ($M_d = 1.42$, $p < 0.05$) and Simple idols ($M_d = 1.56$, $p < 0.05$).

Table 4
ANOVA Analysis for logged outputs with Significant Results.

Outcomes	Sum of Squares	F-value	Cluster	Cluster	Mean Diff (M_d)
Subscribers	158.5	48.08***	1	2	1.67***
			1	3	1.22***
			1	5	1.31***
			4	2	1.74***
			4	3	1.28***
			4	5	1.38***
Total Views	166.4	24.24***	1	2	1.68***
			1	3	1.13***
			1	5	1.43***
			4	2	1.81***
			4	3	1.26***
			4	5	1.56***
Avg. Video Views	217.2	33.1***	1	2	2.02***
			1	3	1.44***
			1	5	1.58***
			4	2	2.00***
			4	3	1.42**
			4	5	1.56**
Max. viewers in Stream	295.7	41.43***	1	2	2.36***
			1	3	1.56***
			1	5	1.97***
			3	2	0.80**
			4	2	2.33***
			4	3	1.54***
			4	5	1.94***
Avg. viewers in Stream	226.0	38.02***	1	2	2.03***
			1	3	1.32***
			1	5	1.63***
			4	2	2.11***
			4	3	1.40***
			4	5	1.71***
SuperChat Amount	51.65	21.77***	1	2	0.85***
			1	3	0.62***
			1	5	0.88***
			4	2	0.97***
			4	3	0.75***
			4	5	1.00***
No. of SuperChats	33.9	13.16***	1	2	0.69***
			1	3	0.54***
			1	5	0.61***
			4	2	0.82***
			4	3	0.67**
			4	5	0.74**
Like Rate	0.03	3.37**	5	1	0.04***
			5	4	0.04**
Comment rate	0.0001	13.23***	1	2	−0.002***
			1	3	−0.001**
			1	5	−0.001***
			4	2	−0.002***
			4	3	−0.001**
			4	5	−0.001***

*** p < 0.01, ** p < 0.05.

Comparing livestream views, we notice significant differences between clusters regarding the peak amount of livestream views (F=41.43, $p < 0.01$). Notably, Corporate idols are able to hit significantly higher concurrent viewers as opposed to Independent influencers ($M_d = 0.8$, $p < 0.05$). Aside from this notable exception, our other results predictably show that Corporate streamers have higher peak concurrent viewers than Independent influencers ($M_d = 2.36$, $p < 0.01$), Corporate idols ($M_d = 1.56$, $p < 0.01$) and Simple idols ($M_d = 1.97$, $p < 0.01$). Similarly, Professional streamers is able to hit higher peak viewership numbers compared to Independent influencers ($M_d = 2.33$, $p < 0.01$), Corporate idols ($M_d = 1.54$, $p < 0.01$) and Simple idols ($M_d = 1.94$, $p < 0.01$). This is replicated for the average number of concurrent viewers the VTuber's stream typically has as well (F=38.02, $p < 0.01$), with Corporate streamers outperforming Independent influencers ($M_d = 2.03$, $p < 0.01$), Corporate idols ($M_d = 1.32$, $p < 0.01$) and Simple idols ($M_d = 1.63$, $p < 0.01$); and Professional streamers also outperforming Independent influencers ($M_d = 2.11$, $p < 0.01$), Corporate idols ($M_d = 1.40$, $p < 0.01$) and Simple idols ($M_d = 1.71$, $p < 0.01$) too.

Our final set of logged outputs pertains to the SuperChat received during the stream. We can show that for SuperChat amounts (F=21.77, $p < 0.01$), Corporate streamers receive high donations from viewers than Independent influencers ($M_d = 0.85$, $p < 0.01$), Corporate idols ($M_d = 0.62$, $p < 0.01$) and Simple idols ($M_d = 0.88$, $p < 0.01$). Likewise, Professional streamers generate more donations compared to Independent influencers ($M_d = 0.97$, $p < 0.01$), Corporate idols ($M_d = 0.75$, $p < 0.01$) and Simple idols ($M_d = 1.00$, $p < 0.01$). With SuperChats (F=13.16, $p < 0.01$), Corporate streamers receive more SuperChats compared to Independent influencers ($M_d = 0.69$, $p < 0.01$), Corporate idols ($M_d = 0.54$, $p < 0.01$) and Simple idols ($M_d = 0.61$, $p < 0.01$). This is replicated in Professional streamers for Independent influencers ($M_d = 0.82$, $p < 0.01$), Corporate idols ($M_d = 0.67$, $p < 0.05$) and Simple idols ($M_d = 0.74$, $p < 0.05$) too.

We notice several discrepancies with our relative outputs as well. Regarding the number of likes the channel's video gets relative to the number of views, there is a difference in clusters that are significant (F=3.37, $p < 0.05$). Simple idols get more likes compared to Corporate streamers ($M_d = 0.04$, $p < 0.01$) and Professional streamers ($M_d = 0.04$, $p < 0.05$). Our second metric (F=13.23, $p < 0.05$), the comment rate of the channel provides evidence that Corporate streamers and Professional streamers have a smaller number of comments relative to video views for Independent influencers ($M_d = -0.002$, $p < 0.01$), Corporate idols ($M_d = 0.001$, $p < 0.05$) and Simple idols ($M_d = 0.001$, $p < 0.01$).

6. Discussion

The virtual entertainer industry is a growing field that has been expanding rapidly in the last few years, especially with the surge of virtual entertainers on streaming platforms. This has generated much interest in the trend and encouraged an exponential increase in participants, both creators and the audience. Given its commercial potential for firms within the industry and those outside of it, it is important for them to understand the differences between types of virtual entertainers and how they vary on major stream and channel outcomes before deciding on the best collaborator or if they are creating their own, the best positioning strategy for their own virtual entertainer. We identified 16 public characteristics that could be used to differentiate Virtual

entertainers and collected this information from 293 Virtual YouTubers along with 9 outcome variables. We find results that have important implications for established practitioners and new entrants in this field.

Virtual YouTubers can be separated into 5 meaningful clusters that vary on three main dimensions – (1) Organizational Support & Resources, (2) Level of Self-Expression, and (3) Level of Activity. We identified key traits associated with each cluster alongside the dimensions that guide our cluster classification. In addition, we could compare each cluster's impact on outcome variables. Specifically, we establish 3 conceptually different clusters but display outcomes that were not significantly different.

Independent Influencers do not have organizational support and resources but are able to express themselves without corporate oversight and tend to produce content at a moderate level. Corporate Idols are supported mainly by small companies trying to break into the Virtual entertainer circle, prompting active entertainers to produce frequent content and streams. They have as much support and resources as a small company can provide. However, due to the commercial nature of these entertainers, many aspects are tightly controlled by management, leading to a lack of self-expression. Small companies support simple Idols or are independent, thus, they do not have much in the way of resources, affecting the amount of content they can produce. However, they can express themselves more freely than their Corporate Idol counterparts.

More importantly, our research recognizes two conceptual and empirically distinct clusters from the three aforementioned clusters when comparing stream outcomes. They include the Corporate Streamer and the Professional Streamer. Although large corporations support both classes of Streamers, thus providing them with access to resources and organizational support for their activities, their level of activity and self-expression differs. Much like Corporate Idols, Corporate Streamers have to deal with control imposed by management. Although they actively engage with their audience, their self-expression regarding personal disclosure is limited.

Furthermore, these streamers belong to the organization and may be tasked with performing other activities that will reduce the time they can spend streaming and creating content. On the other hand, Professional Streamers can express themselves relatively freely and can maintain high levels of productivity, churning out game streams regularly. These two groups of streamers can attain significantly higher subscribers, views, and SuperChats than the other three clusters. Despite this, both clusters underperform on relative indicators such as the ratio of likes and comments compared to some of the other clusters, with Simple Idols getting a lot more likes relative to views compared to these two clusters. Another notable difference is how these clusters get fewer comments relative to their viewer numbers compared to Independent Influencers, Simple Idols, and Corporate Idols. Lastly, Corporate Idols can attract significantly higher peaks of viewership during their livestream compared to Independent Influencers due to their difference in organizational support and activity levels. These insights generate important and relevant implications for academics and practitioners.

6.1. Theoretical contributions.

Our current study advances our understanding of the virtual entertainer phenomenon. Given the novelty in a relatively unexplored field, our study attempts to forge a unified understanding of the existing VTubers that operate in the industry. Current research considers virtual entertainers a monolithic group (Lu et al., 2021; Miyake, 2022). However, our findings suggest that virtual entertainers are not homogenous, and we can capture this complexity by codifying different segments of VTubers that exist within this ecosystem. Important nuances that may otherwise enrich research findings may be lost without considering the differences within this segment. In expanding the conceptualization of virtual entertainers, we uncover the underlying composition of this segment and provide information on aspects that serve as important characteristics of each archetype. Through this, we can supplant and enrich current theories addressing the virtual entertainer phenomenon by differentiating between these archetypes and characteristics that may impact their performance. Future researchers should factor in these archetypes when theorizing about the virtual entertainer industry by using them as a framework for their research. Moreover, we identify three major distinguishing factors that the audience uses to categorize VTubers – the level of organizational support, activity, and self-expression.

These insights can be developed into interesting theoretical perspectives on how the audience processes information in this industry. Finally, we observe important stream and channel outcomes that matter to VTubers, understanding key performance metrics that can be used within this industry and demonstrating how each archetype performs on each outcome variable. We expect this to be an important contribution to researchers in the VTuber domain, as these metrics and archetype results can be used for further research. Our research has implications not only for the virtual entertainer industry but for virtual influencers in general. Many of these traits and characteristics that virtual entertainers have are shared across all virtual influencers, and attributes deemed important by audiences, such as avatar dynamism and other context-specific proxies of the activity or organizational support, can be used by researchers in tangentially related fields.

6.2. Managerial implications.

Our results hold significant practical implications for Virtual Entertainers operating in the industry or companies planning on entering the industry. First, to both VTubers and their agencies, it is important to understand the composition of virtual entertainers in the current ecosystem to effectively position themselves or risk failure. Failure is extremely common in the VTuber industry (Parker-Dalton, 2022). Before a VTuber debuts, they often must decide on a positioning strategy. Most VTubers start off as proof of concept before building up a fan community and achieving some level of commercial success. Proper positioning reduces the time needed to become popular and develop a community. Since this industry is relatively new, companies operating in it may not have a proper strategy for the direction of growth that their talents should pursue, resulting in suboptimal positioning and struggling to attract fans. Using classification techniques, our study has uncovered five major archetypes that dominate the current VTuber market now. This provides a blueprint that companies can use to mold and position their Vtubers, aiding VTubers by simplifying the overall complexity of the market and increasing the efficiency and efficacy of implementing marketing strategies without wasting time pursuing unprofitable positioning strategies.

Our study also communicates the impact each archetype has on different stream and channel outcomes. With this information, VTubers and the companies behind them can plan goals appropriately depending on the archetype they fall under. Certain archetypes favor community growth as they can attract more viewers, while others support commercial success, generating revenue faster than other archetypes. Depending on the VTuber's primary goal and the archetype they fall under, they can design a developmental strategy to achieve their goals and ensure that they succeed. Balancing the needs and interests of the consumer while remaining profitable is challenging in a highly saturated market environment. Vtubers must be highly responsive to the archetype that resonates most strongly with their targeted audience and balances their particular needs. For instance, Vtubers in the Professional Streamer archetype would need to be able to more closely adhere to audience interests to retain high viewership numbers – often prioritizing video game streams that allow for ready content creation that could potentially last several hours. VTubers in archetypes who do not perform as well on their desired goal may consider repositioning themselves to ensure that they can meet these goals. This will give virtual entertainers and their agencies greater decision-making capabilities through the

information provided by the characteristics of each archetype and increase their likelihood of succeeding in this industry.

7. Conclusion

Our study seeks to present an overview of the virtual entertainer industry and the rising trends in this industry. Through inductive modeling, this paper has succinctly captured the complexity of this emerging market by providing a typology of content-creator behavior designed to appeal to specific consumer cohorts, generate revenue streams, and adapt to shifting audience demands. We have identified virtual entertainer archetypes amongst the virtual streamers, known colloquially as VTubers, and how each archetype affects important stream and channel outcomes. With our paper as a base, we hope to provide an effective staging ground for academics interested in studying this phenomenon and generic guidelines for practitioners planning on entering this industry. We acknowledge that this study has several limitations that serve as grounds for further research. First, our study looks at a subset of 294 channels in the Virtual YouTuber industry. Although we believe this sample is sufficient in teasing out the existing archetypes, a more comprehensive study utilizing all streaming channels can be conducted. Furthermore, we address only Virtual entertainers on YouTube and not on other platforms such as Twitch due to a lack of data. Another factor that our study did not consider was that we only considered VTubers that are currently operating and thus have achieved some measure of success. Our study was unable to account for VTubers who have exited the industry since we lack the corresponding data required for such an analysis. Future research could expand the scope of research by identifying characteristics and outcome variables that can be consistently compared across platforms and conduct an extensive study that includes VTubers that were unsuccessful in the industry.

Second, although our study provides a general understanding of the Virtual Entertainer phenomenon, more could be done by incorporating additional layers such as the psychological motivations behind these archetypes along with other subjective variables. Although we have included a content analysis to understand what aspects of a Virtual Entertainer viewers consider important in distinguishing between these virtual influencers, delving deeper into the motivation of Virtual Entertainers and their audiences may provide critical information on how each archetype functions. Furthermore, variables identified in our content analysis are considered equally important. Although this is a conservative estimate, it would be more realistic to consider how the viewers weigh each variable and construct archetypes that are enriched with more information.

Third, as this field is relatively new, its consequence on consumers, businesses, and society is relatively unexplored. Mechanisms that affect a particular entertainer model may not apply to virtual entertainers. As such, there is a need to re-evaluate conceptual frameworks used in influencer research and their corresponding impact on this new phenomenon. Finally, any research that extends the empirical exploration of virtual entertainers, disentangling factors that have an impact on stream outcomes, would provide much-needed valuable insight that practitioners are interested in. Although some of these appear challenging, we hope our research can encourage more work in a field in its infancy, serving as a stimulus for future work in this domain.

CRediT authorship contribution statement

Yee Heng Tan: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Barbara R. Greene:** Writing – review & editing, Project administration, Investigation, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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