Avatar, community, and lore:
An exploratory study of
independent VTubers

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ABSTRACT

The use of digital avatars in live streaming, called VTubing, has seen a steady rise over the past 5 years. The increase in VTubing has had transformational effects on streaming as a practice, and on game culture in a larger sense. Previous work on VTubing indicates that the creation of the digital avatar is a central aspect of the practice. This work also indicates that the presence of the avatar is a major draw to performers and viewers, and changes perceptions of the stream for both. However much present work focuses on larger audience VTubers, or those who are backed by a studio. This work investigates a question and answer forum for VTubers to understand their perception of the practice in terms of day-to-day requests for information and advice. It contributes a framework of VTubing as a practice that can be built upon in future theoretical work within this domain.

Keywords

VTubing, VTubers, Streaming, Live Streaming, Game Culture

INTRODUCTION

A confluence of increased processing power, higher grade consumer webcams, and live 3D animation technology has given rise to a popular new forum of streaming, colloquially called VTubing, where the live presence of a streamer is replaced by a 3D model that interprets body motion and facial expressions in real time (Ferreira et al. 2022). The name comes from a shortening of 'virtual Youtuber', and rose to popularity in 2016 starting with the performer Kizuna AI (Ferreira et al. 2022; Lu et al. 2021; Zhou 2020), but quickly expanding through a studio system that supported and promoted early streamers (e.g. https://hololivepro.com/en/).

In general streaming has experienced a rise in popularity over the past 4 years since the COVID 19 pandemic, and VTubing viewership has risen at a higher rate than traditional streaming (An 2023). Given the importance of streaming in general as an element of global game culture (Johnson & Woodcock 2019b), VTubing's increasing popularity necessitates increased scholarly consideration. Much of the work that has been done around VTubing has focused on larger streams that are often

professionalized and backed by studio systems which provide both technical and material support (Ferreira et al. 2022; Lu et al. 2021; Wan & Lu 2023; Zhou 2020). For studio backed VTubers, the performers often have teams that are dedicated to community and stream management (Ferreira et al., 2022; Zhou, 2020). Alongside the growth of large, studio supported VTubers, there has been a rise in smaller independent VTubers, with these smaller streams making up the bulk of new broadcasters in this market (An, 2023). However, very little is known about smaller independent VTubers in comparison to their studio supported counterparts.

Previous ethnographic work in streaming (e.g. Taylor, 2018) has been incredibly useful to position further theorization around the impacts of streaming broadly in game culture (Anderson 2017), to develop new technologies associated with streaming (Moosavi et al. 2024), and to conceptualize how streaming feeds back into the logics and economies of production of digital games (Woodcock & Johnson 2019b). In the following paper I present a study of one month of discourse within a platform dedicated to answering practical questions around the practice of VTubing. This work was undertaken with a goal of understanding the practical dimensions of broadcasting as a VTuber, and a larger aim of developing sensitizing concepts in the sense of grounded theory, which can be used to develop larger theories around a cultural practice.

The paper begins with a review of related work that synthesizes existing literature on game culture studies of streaming with emerging work around VTubing, developing a research question that focuses on the practical reality of broadcasting as a VTuber. This research question is investigated through a grounded theory study of a forum dedicated to question and answers discussion about VTubing that is frequented by smaller viewership VTubers, providing analysis that helps to understand the day-to-day practical questions asked by these performers. The findings presented in this paper focus on three common themes that emerged through this analysis: the avatar, the community, and the development of an on-screen personality that combines elements of both to attract and maintain a supportive regular viewership.

RELATED WORK

Streaming is a core aspect of modern game culture, and has had transformative effects on how players and audiences engage with digital gameplay (Johnson & Woodcock 2019b; Pellicone & Ahn 2017; Taylor 2018). From the audience perspective, live streamed games offer shared communities, opportunities to see gameplay of prospective purchases from a trusted source, the ability to learn from a skilled player, personal connection to the broadcaster, and alternative interpretations of game culture that might be missing from the mainstream (Brewer 2023; Gray 2017; Hamilton et al. 2014; Kaytoue et al. 2012; Ruberg & Lark 2021; Sjöblom & Hamari 2017). From the perspective of the streamer, it is a way to build

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welcoming online communities and serves as a venue of self-expression, as well as acting as a source of revenue (Hamilton et al. 2014; Johnson & Woodcock 209a Pellicone & Ahn 2017; Taylor 2018). The study of streaming allows not only an understanding of the practice itself, but also serves as a lens into game culture, since it is a way that individuals perform identities as players of games (Lin et al. 2019; Pellicone & Ahn 2017).

Previous work on streaming positions it as an activity that also constructs a social space and builds communities that exist for their own benefit (Hamilton et al. 2014; Taylor 2018). Growing a community, in addition to the obvious benefits of increased viewership, is seen as a major appeal of streaming, both in terms of creating a hangout space (Hamilton et al. 2014; Jacobs & Booth 2021; Pellicone & Ahn, 2017; Taylor, 2018), and providing volunteer support for running a digital live production (Johnson, 2021; Pellicone & Ahn, 2017; Taylor, 2018; Wohn & Freeman, 2020). The social space of a stream can be an opportunity for people who do not feel well represented in larger game cultures to find like minded communities and resist hegemonic forces in gaming (Brewer 2023; Consalvo 2019; Gray 2017; Gray & Sarkeesian 2020). As Wulf et al. (2020) write, "Twitch offers a place where the topic of a certain game assembles people who share their interests and offers the opportunity to communicate with both peers and experts for a specific game," (p. 339). The research above indicates that a stream offers a central point for people with similar interests related to games, which builds community connections that exceed the draw of initial content of the broadcast itself.

Streaming can be seen as the practice of bringing together multiple platforms, technologies, and community spaces into a cohesive socio-technical artifact (Johnson 2021; Pellicone & Ahn 2017; Taylor 2018). Putting together a stream will often require the broadcaster to act simultaneously as a graphic designer, a programmer, a community manager, alongside broadcasting (Anderson 2017; Johnson 2021; Pellicone & Ahn 2017; Taylor 2018). Given the social focus of streaming, shown above, the labor of putting together a stream will often be divided among audience members, who may help with production, and (importantly) serve as moderators (Brewer 2023; Mihailova 2022; Pellicone & Ahn 2017; Seering et al. 2017; Taylor 2018; Wohn 2019). Audience serving as co-creators mirrors previous work on other forms of social production, where viewers cross boundaries into more official roles in digital spaces (MacCallum-Stewart 2014). Brewer (2023) calls attention to this in terms of LGBTQIA+ streams, where intentional trolling based on stream categorization is a major concern for both broadcasters and their communities, who need these tags to attract a strong community, but also can have this categorization used against them.

As a practice streaming offers great opportunities to build supportive communities and as an avenue of self-expression, however it is also labor intensive, and presents risks of being exposed to toxicity and hate speech.

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VTubing

A recent trend in live-streaming is the use of virtual avatars to represent the broadcaster, which is often called "VTubing". VTubers, originally "virtual YouTubers", came to prominence in Chinese, Korean, and Japanese markets in the late 2010s, often featuring female avatars derived from the tradition of anime and otaku culture (Chen 2020; Lu et al. 2021; Wan & Lu 2023). These early VTubers historically were frequently backed by studio systems, which handle the voice talent who helm the avatars, manage advertising and community relationships, and provide technical and material support for the streams (Colp & Nico 2020; Ferreira et al. 2022). As the format gained popularity other independent VTubers have become extremely prevalent on streaming sites such as Twitch (Chen 2020; Ferreira et al. 2022). Over the past 5 years, coinciding with general increases in stream viewership due to the pandemic, VTubing has become a very popular genre of streamed content (An 2023).

VTubing adds another dimension to the construction of a stream, which centers on the creation of a fictional persona embodied in an animated avatar. The quality and expressiveness of the virtual avatar is seen as being paramount for the creation of the digital artifact of the stream, e.g. Tang et al.'s (2021) technical study of VTubers for a tool to improve expressivity in VTubing avatars.

The avatars that VTubers adopt are often drawn from a mixture of personal interests alongside the imagery and texts of various fan communities (Lu et al. 2021; Wan & Lu 2023). The creation of a VTubing avatar has similarities to other avatar studies in game culture in terms of embodiment and identity (e.g. Taylor 2002), but with a specific focus on the avatar being created as both self-expression and with considerations for entertaining an audience (Bredikhina 2020). Previous work on livestreaming indicates that a major aspect of the practice is the presentation of the self as a player of games (Pellicone & Ahn 2017), so the introduction of a virtual avatar to the practice means that this expression must then be filtered through design choices associated with that avatar, such as aesthetics, relationships to other media domains, and fictional elements (Bredikhina 2020; Lu et al. 2021; Wan & Lu 2023).

Fantastic and fictional elements of the avatar add interest to viewers, since it allows for a backstory that would seem out of place for a face-cam streamer, and broader fictional storylines among communities of streamers that add richness to the social aspects of VTubing (Lu et al. 2021; Wan & Lu 2023). In terms of the performance of the stream itself, VTubing gives the broadcaster more freedom in how they act, since it is attached to a fictional persona that gives greater social license (Bredikhina 2020; Bredikhina & Giard 2022; Giles 2018). A similar, though earlier field of study is

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that of 'digital influencers'. Digital influencers are distinct from VTubing in the sense that there is no stable broadcaster behind the avatar and the content is rarely live streamed, but with similarities in terms of how a digital avatar is embodied in a media artifact. Work on digital influencers finds that the lack of reality is both a benefit and a detriment to these influencers: they are free from many physical constraints, they have greater laterality in terms of expressing shocking content or opinions, and anonymity or pseudonymity affords greater protection from context collapse of audience and performer (Stein et al. 2022). However, at the same time, the inherent unreality also leads to reduced trust, potentially distorted perceptions of reality (especially regarding the very traditionally beauty and gender norms VIs tend to embody), and a 'creepiness factor' if participants begin to form real attachments to a virtual creation (Choudry et al., 2022). The parasociality with a digital avatar is a repeated theme in work on VTubing itself, for example Lu et al. (2021) find that viewers see the unreality as a benefit since it means they can form attachments without worrying about exterior realities of the streamer (such as real world romantic partners). From both the viewer perspective and the broadcaster perspective the mediation of the digital avatar offers both distinct benefits and drawbacks in terms of how viewers relate affectively, socially, and technically to the streamer.

Alongside a desire to create an avatar that matches the streamer's online presence, there is also an opportunity to use the avatar as a source of identity play. Bredikhina & Giard (2022) elucidate this in their analysis of Japanese male VTubers who use female avatars to broadcast. Their informants reported that by taking on other personas they were able to embody and perform emotions that they felt limited to express in their day-to-day lives, such as youthful exuberance. Respondents said that this fantasy provided an outlet not only from individual expectations of traditional male gender norms, but also larger socio-political realities and pressures. Their onscreen performance also then helped them to process emotions in their own life, for example social nervousness, anxiety about gender norms, and body image. However, as with previous work in this area (Wan & Lu 2023), there is a critique to be offered in terms of how these self-presentations often conformed to stereotypes associated with how young women are presented in media such as anime (Bredikhina & Giard 2022). Previous work on avatar creation reaches similar conclusions - avatar creation is mediated by the technology, culture, and politics of the platform that the avatar is being designed for, often reflectin dominant social ideology around class, race, and ethnicity (Kolko 1999; Nakamura, 2002). Brett's (2022) analysis of VTuber avatar creators shows that there is awareness of the problematic aspects of VTubing avatars among both creators of the avatars, broadcasters, and viewers.

Much of the current work described above has focused on either studio supported VTubers (who are managed by larger media organizations), or well established VTubers. There is less focus on small independent VTubers, who make up a bulk of

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the broadcasters represented on platforms like Twitch (An 2023). As noted by Wohn (2018) and Phelps et al. (2021), smaller streams are often in unique positions due how they differ in terms of monetization and the amount of volunteer labor that is available to produce the stream as compared to larger, fully monetized, or industry backed streams. This points towards the importance of understanding small, independent VTubers as a distinct population. Additionally, there is little data in general about how VTubers put together their broadcasts at all levels. Work so far has largely focused on broadcaster and viewer perceptions of the practice, but there is less practical focus (e.g. Taylor's (2018) ethnography of streaming as a digital practice) on how a stream comes together as an artifact. These gaps motivate a guiding research question for the present work:

> RQ: How do independent VTubers conceptualize the practice of broadcasting, and how do they approach putting together their stream as a digital artifact?

The present work seeks to answer the above question through an analysis of a question and answer forum dedicated to VTubing, using participant discourse to define common sources of questions and concerns raised by smaller independent VTubers.

DATA COLLECTION AND ANALYSIS

The goal of this research is to understand the practice from the perspective of a broadcaster, and to highlight important aspects of the practice. Thus the current work takes on the method of iterative grounded theory. In iterative grounded theory the movement from concrete statements of participants to theory is done by codes that gain specificity and meaning as the researcher builds understanding around what they are studying (Charmaz 2014) which takes place alongside the process of collecting that data with greater refinement as theory takes shape (Creswell & Creswell 2023). Iterative grounded theory fit the research question since this is still an emerging field of study, and the question is largely about developing exploratory sensitizing concepts, meaning the knowledge that helps to build a conceptual framework for more complex theory (Charmaz 2014; Creswell & Creswell 2023; Seibold 2002).

In order to understand the research question above, it was important to find a source of discourse around VTubing that also centered practical elements of livestreaming that have been delineated in previous work, such as assembling technology, attracting and moderating a community, and tying together related social media sites (Pellicone & Ahn 2017; Taylor 2018). In addition, the factor of the digital avatar was seen to be important from previous work on VTubing (Lu et al. 2021; Wan & Lu 2023). Therefore a site was selected that fit the following criteria: regular posts about technical aspects of VTubing, regular posts about social and

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'soft' elements of VTubing (e.g. community moderation and burnout), and discussions around the creation and creative decisions involved in the VTubing avatar. This led to the selection of R/VTubers, which is a subreddit that receives regular daily posts. R/VTubers was additionally attractive as a site of analysis because it tends to be frequented by smaller, independent creators, and is largely about the practice of VTubing.

Data was collected from R/VTubers through daily reading of the forum in order to produce field notes. These fieldnotes were the primary document of analysis, and were then collated into analytic memos on a weekly basis. This allowed for the iterative development of codes that were grounded in the discourse of the forum. Field work took place over the course of a month, after which 756 posts were archived for reference. The coding process developed three high level codes (described below). These high level codes were then interrogated using the archived post data, which was searchable, and allowed for increased richness in analysis. Analysis was concluded as data reached saturation, and new analysis stopped adding meaning to the research question or producing new sub-codes (Charmaz 2014; Creswell & Creswell 2023; Star 2007).

ETHICS STATEMENT

All posts collected as data were public posts that are visible as part of the open web. In instances where posts were deleted, the posts were also removed from being reported as part of this analysis at time of writing. Some text has been slightly changed to protect the expectation of pseudonymity for posters in online spaces. This was collected as part of a project with an ethics approval from the Falmouth University ethics board.

FINDINGS

This memoing process provided three primary codes that emerged from the fieldwork process. **The Avatar and the Debut**: this code was attached to data that was tagged with sub-codes regarding the selection, commissioning, production, and debut (celebratory first stream with an avatar). **Finding Community**: this code was attached to data that was tagged with subcodes about strategies for building a community, the pleasure associated with having a community, efforts to distinguish the stream from other streamers, and also with concerns about the saturation of the market for VTubers. **Assembling Personality**: this code was attached to data that was tagged with codes relating to the personality that the streamer wanted to present on stream and tied to the other two codes in the sense that their avatar also impacted their community, this also included the construction of elements that support and supplement the avatar, such as emotes, stream overlays, and interactive elements. This section will look at each of these high level themes and

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supporting data from the analytic process, highlighting the practical importance in the larger conception of VTubing as a practice.

The Avatar and the Debut

The discourse around avatars was largely related to the selection, design, and creation of VTubing avatars as technical artifacts. In VTubing the avatar must not only be visually appealing in terms of design, but also work as an a responsive animated element of the stream that is rigged to respond smoothly to motion capture. Alongside the aesthetic dimensions of the model, posters also expressed a desire that the avatar fit with a larger branding of the stream as a digital artifact with specific technical requirements.

An example of this comes from a post by Zelder advertising their stream, which describes their stream in these terms, "Pay us a visit if you enjoy watching:, Art (while chatting about absurd things), Programming (usually game or OBS related), Animating, Game Modding (mostly minecraft), Cryptography, Aswell as just gameplay of niche games. We also do short skits on our channel! We will be showcasing more features our model has on the coming weeks!" In this advertisement the poster is calling attention to content (art, programming, etc.), dispositions ('chatting about absurd things'), and importantly also the technical capacity of the model (the ability to do skits and other features in progress). Broadly, the technical capacity of an avatar refers to features such as audience interaction, where viewers can spend a currency specific to a broadcaster called 'channel points' to produce animations from the avatar on demand. The post from Zelder above is advertising their 'debut' - a name given to a specific milestone stream where broadcasters show off an avatar as their primary on-screen presence. The debut is an extremely important concept to posters on R/VTubers.

A Poster named Bolt7 phrases it in these terms, "I officially debuted today since becoming a vtuber about four years ago. I'm so glad I was able to debut after all this time with a model I've been dreaming about all these years!" Here Bolt7 is calling attention to the idea that they've been VTubing for four years, but only now have a model that they feel is worthy of a debut. A poster named Nix phrases their debut in terms of being a future event that will be built towards as they continue streaming, "Hello folks! Im Nix, a hopefully soon to debut Indie Vtuber. I'd say Im a pretty chill guy and I think if you stick around till my debut, you won't be disappointed with what I've got to show you all!!"

The concept of a debut stream as a milestone in VTubing is present across the data. This is phrased in terms of a question asked by a poster named Kellllie, "What are some ways to grow interest before a debut with a small following?" which continues, "I'd like to have some sort of a debut just so I can upload it as an intro video. I don't mind if only my friends and family really show up but it would be great if I could get a little more interest beforehand. What are some ways I could grow

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that interest?" Kellllie points towards a common trait in terms of the debut, where it is not only an event that frames the broadcaster's personality and approach to streaming, but also an artifact and a sense of pride. In Kellllie's case it will serve as an intro video that plays before a stream starts, with the goal of this video being used for growing and developing their community.

The fact that a debut might happen extremely late in the career of a broadcaster shows a disposition across the data. Aligning the connection of the avatar that a broadcaster is using to their personality to their content is thus a major concern, with the debut being a major milestone that occurs when they believe that they have successfully merged these two elements. An example of posters merging their personality, the avatar, and their content comes from a poster called Gox, who is using a space alien avatar, and phrases their debut like so, "Hi Space cadets! I'm Gox, an energetic, cute, silly and bubbly new vtuber from outer space. I hope you consider following me on my socials and join me on my debut stream!! … Its hard work as I'm currently a one person show, and doing all this art, posting, animating, software engineering and business managing is quite the activity so any support really helps me keep this up!" This post also speaks towards the fact that streaming as an independent VTuber is extremely labor-intensive, even in comparison to similar findings about traditional streamers (e.g. Taylor 2018). Here Gox mentions several of these additional requirements: art, social media posts, animation, and software engineering to keep everything operating together. This must be done alongside the performance of a broadcaster in character: a space alien who is 'energetic, cute, silly and bubbly'.

An aspect of VTubing that is added alongside traditional management of a stream is the presence of a fictional storyline, sometimes called 'lore'. The lore of a VTuber typically gives them a fictive backstory that helps to explain the fantastical elements of their avatar, and often ties into their onscreen personality and selection of content. A thread that helped to surface this concept was a general discussion question about how various posters handled the lore component of their onscreen personalities. This thread elicited a number of responses. One poster responds, "I'm a shark space marine from the 40k universe. I'm a librarian who plays 'old' games from the 21 century in order to attract a crowd," which takes a common strategy of using existing media properties (in this case Warhammer 40K) as a way to frame their avatar, alongside more traditional streamer considerations like playing older games. Another example is more verbose, mentioning a larger and more developed story that revolves around being the last human left after an alien invasion, including details like, "My entire body and face is covered in clothing from whatever style was popular at the time, as with all these modifications my perception time as my body was trying to realise what happened to it. By the time it was complete, I was the only human left alive besides any genetic code we saved." Other posters were less concerned with lore, or unclear on the need for lore in their onscreen persona, such

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as, "Idk what lore to give mine honestly I'm still surprised you're supposed to give lore."

These responses represent a wide variety of attitudes towards lore in VTubing. An example of lore as a primary consideration in the creation of an avatar comes from a poster who writes, "I've wanted to make content for a while, but I wasn't sure what *kind* of content I wanted to make. Though I only started watching vtubers a couple months ago I know that this is the direction I want to go. Making my own character and simultaneously blending roleplay and reality with a live audience sounds like just what I've been needing all this time. I even have a design in mind and lore fleshed out already." In this post lore is being presented as being a complimentary aspect of a character alongside their visual design. The avatar and the debut present a large portion of codes in the analysis of the space, however the relationship of the streamer to their community also are a frequent topic of conversation and a major concern for a practice that is centered around the development of a supportive and engaged community.

Finding Community

Broadcasters posting to the forum would often preface their posts with the fact that VTubing is an extremely competitive market that has only grown in popularity over time (e.g. An 2023). This is shown in a response to a longer post that is about complex rigging of hand movements (which is uncommon for models, that tend to have static hand models for the sake of reducing complexity). A poster named CindyBot replies with a response that is technical and helpful, but ends with additional advice, "You don't *need* any of that stuff, but you should prepare yourself for the possibility that no one will watch you to start. It takes a long time to find people who will watch and stick around, to be honest. You may have 0-1 viewers for a looong time, and that's totally normal. Frustrating, but normal." CindyBot's advice mirrors general advice for streaming (e.g. Pellicone & Ahn 2017), but is uniquely positioned within the context of a specific streaming practice that requires additional technology that is costly and time consuming to assemble into a pleasing form (see above).

This cost and difficulty is accompanied by a panopoly of services offered to VTubers from independent creators, mostly focusing on the creation, rigging, and maintenance of an avatar and the related art assets required for a stream. This leads to posters perceiving a great deal of advertising to VTubers, some of which are outright scams - for example reselling free models, or promising a commissioned model that is never delivered. A poster named Nellow described this frustration as such, "To add insult to this injury I was hoping that using twitter (I refuse to call it X) to find people to collab with, but every time I get a follower that looks like a vtuber it says things like 'art commissions now open' or 'I make high tier vtuber models' or such and any attempt to talk with them is just them asking me to look at their portfolio and 'did you know I have a 50% off sale?!'" Nellow's posts shows an

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additional perceived barrier to creating a community as a VTuber. From the literature above community is known to be both a major draw of streaming, and often necessary to preventing trolling or abuse through community moderation (e.g. Pellicone & Ahn 2017; Taylor 2018; Wohn & Freeman 2020).

When a broadcaster is able to find a supportive community, they often highlight how this is a primary draw of the practice, which came up in a thread dedicated to broadcaster's favorite aspects of the practice, with a poster named wry56 phrasing it as such, "[My favorite part of Vtubing is…] making small connections with viewers, honestly. I'm not very big so when I see new viewers, I'm able to remember them. I had another streamer stop by my stream (playing Spyro) and they helped me with a puzzle I was stuck on. I was able to see them stream a few days later (also playing Spyro) and they were excited to see me pop in and were asking me for advice on how to solve the puzzles they were stuck on. It's my favorite interaction so far :]"

The community that is being built among broadcasters is often constituted of other people who are VTubers, as with the quote above. Another example comes from a question and answer post by a poster named Gally, asking for advice about collabs, "Any general advice for collabs? I was recently invited to a smaller community of vtubers and I want to reach out and see if anyone is open to streaming together. Are there any unspoken rules of collaborations, or known [etiquette]?" This collaborative structure of building audience from communities of other VTubers is common within the forum, and often presented as both a major appeal of the practice, and advice given to newcomers who are seeking guidance on how to increase their viewership. The creation of the technical aspects of the stream, largely focusing on the avatar, in service of finding a supportive and welcoming community represents two of the largest concerns among posters to this forum. However, there is a larger question that concerns how these elements come together to form a cohesive media artifact.

Assembling Personality

With the goal of creating an unique avatar that reflects the broadcaster's disposition and content and is capable of attracting a supportive community, the process of VTubing can be seen as an effort to create a personality that takes on both real and fictive elements of the streamer. This process shares similarities with traditional streaming, however is made more complicated by the additional technical requirements of VTubing, which includes facial and motion tracking through a high quality webcam, aesthetic elements beyond the model (such as emotes, graphics, and external media spaces that match the stream and avatar aesthetics), and the complexity of the model itself, where greater reactivity is seen as being a bonus. This complexity and cost is often a source of frustration for posters, since a professionally made model with rigging can typically cost upwards of several thousand american dollars. A poster named Fuero captures this frustration in describing their current goals as a broadcaster, "While I'm a pngtuber I do wish to get a VTuber model … I

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just want something to be proud of." Here the poster is referring to an alternative to a fully rigged model, where a flat image (a PNG, hence the name) stands in for the model, and vacillates between several simple animation states while moving on the screen, triggered by movement and by voice activation. Fuero is then asked why they don't use a 3D model instead, and they reply, "I do want a 3D model! However it is expensive to get a quality one. … my current Lore set up is that I'm a sloth person and I wanted to have something that represented that ... Once I have enough money I will have a 3D version of my professor sloth made." This is bringing in several concepts from above. Fuero is highlighting the fact that they want a high quality 3D model that matches a fictional aesthetic, and also reflects their lore, however they are currently limited in terms of the cost for this model, leading them to a difficult choice of whether to settle for an option that is presented as being less appealing.

The tension between a desire to broadcast and the cost of obtaining a high quality model is also reflected by a poster who asks for advice while their model is in the process of being finalized, named Mellow who says, "Hi guys! I'm Mellow and I'm just starting to stream on twitch. This is my design [referring to an image in the post] and I'm super excited to have her in the works but it'll take a couple months for the art alone then she'll need to be rigged. In the meantime is it better to just use a premade model? Should I get one off Etsy? I'm not sure what's normal." The tension here lies in whether it's optimal to forgo streaming while waiting for a model that best reflects the desired aesthetics of the stream, or to use a lower quality temporary model and maintain the stream.

Apart from the cost of the model itself VTubing is quite computationally intensive, as shown in a post specifically about buying new hardware for the purposes of a stream, "I'm currently running a AMD Ryzen 3 2300X Quad-core processor and I noticed that when running vtube studio and stream labs at the same time my CPU usage jumps to 100%. I'm trying to figure out if I should upgrade my motherboard processor to a i9, get a different graphics card, or both. If the graphics card are there any recommendations that are not too expensive?" Here the software requirements are VTube studio, which is a main piece of software for interpreting motion capture from a webcam, and Stream Labs, which is broadcast software for running the stream itself. Running both concurrently, given the necessity of live motion capture processing, can be very demanding of the hardware that a streamer may have access to.

Commissioning work from artists is a common practice among VTubers, and represents an additional cost, also shown in the previous section relating to scams around commissions. This comes through in a question about how to work with commissioning artists, where a poster named HollyV asks, "[I commissioned an artist for my model] … I was wondering if i commission them again in the future for an outfit would they prioritize me more than someone else who doesn't have a model?

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Just a thought, and should they? This is more a question for live2d [a particular VTubing platform] artists." Here the poster is asking about general practice of how commissioned artists will treat return customers, and also speaking to a need beyond initial model creation - the design and implementation of additional outfits for the model. This is further elaborated by another poster asking about etiquette, and specifically whether a commission can ethically be done if based off of one of the many free models that are available to broadcasters (although often seen as being lower quality), "is it ok to make a live2d model inspired by a premade model? … Back in 2022, I started streaming with a free premade vtuber model got off vroidhub [a free asset store for VTuber models for a different platform]. Now I want to redesign and commission someone to make a live2d model of the redesign, but it'll have the same hair color, similar eyes (heterochromia but with different colors) and the same theme (cat girl). I tried dming the creator on multiple platforms but they haven't responded."

Commissioned artwork is quite expensive, which leads to a great deal of labor sharing within the community itself, as shown in this post which is related to the redesign of a model (here called an OC, or 'original character'): "I recently redesigned my OC and decided to tackle [Live2D Cubism - a common VTubing software] and decided on a simpler chibi model first. My wonderful friend who is learning Live2D Cubism agreed to rig it for me and it was so much fun seeing my drawing come to life and learning how artist and rigger need to work together for this to happen!" The expense of avatar creation can also lead broadcasters to learning the creative process themselves, as shown in a question posted to the forum about the difficulty and perceived value of learning the tool pipeline as an independent broadcaster, "out of pure curiosity i decided that i wanted to try making a vtuber model (doing both the drawing and rigging)... i could do the drawing easily but as soon as i tried using Live2D i realized just how hard rigging is and i dont think i could do it myself. is being a pngtuber worth it, should i see if i can find a relatively cheap rigging commision, or should i just try to push through and really learn Live2D?" This ties back into the codes that developed around community, where a primary appeal of VTubing seems to be the tight-knit community of other VTubers, who both serve as a fellow audience, and provide necessary labor to keep extremely complex and expensive streams running.

DISCUSSION

VTubing transforms traditional streaming by presenting an additional fictive layer between the viewer and the broadcaster, that of the avatar, which takes on additional meanings and valences in the larger socio-technical mix of the stream (Bredikhina 2020; Lu et al. 2021; Wan & Lu 2023). In the data above this rests between the design and selection of the avatar, the technical artifact of both the avatar and the stream (which must work in conjunction with one another), and in terms of the broadcast of the stream itself. These findings mirror constraints of physical streaming (Pellicone &

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Ahn 2017; Taylor 2018), but are further complicated by the cost and complexity of the avatar as a technical artifact.

As with other types of streaming, a supportive community is necessary to protect the streamer from harassment and scams (Consalvo et al. 2020; Gray 2018; Jacobs & Booth 2021; Ruberg & Lark 2021; Pellicon & Ahn 2017; Taylor 2018). Apart from the utility of a community, the pleasure of finding supportive and like minded individuals is often seen as a goal in and of itself in streaming (Hamilton et al. 2014). In VTubing, especially given its recent surge in popularity (An 2023), the process of forming community is made more complicated by the large number of competitors, the expense and complexity of putting together an appealing stream experience, and the presence of scammers who prey on the expense associated with the practice. However, there is evidence that VTubers will often form their own communities of fellow broadcasters, and also share labor with one another to assemble the technical artifact of the stream itself (often learning the tools associated with it, such as rigging, animation, and digital art). These sorts of concerns would be handled for a broadcaster for a studio supported VTuber (Ferreira et al. 2022), but for an independent VTuber without a firm presence in a supportive community of other VTubers these are major concerns that can serve as barriers to the practice.

VTubing also affords richer types of self expression, which may be especially appealing for some broadcasters, evidenced by this post from a poster named Malka98 discussing what draws them to the practice, "So about a year ago I was streaming fairly often until I had to go and get a surgical procedure which ended up required a lot of recovery time. I want to get back into it but I'm a bit self-conscious ... I feel like vtubing would give me the opportunity to express myself better at least until I'm ready to go back on cam or just as a regular alternative on my channel." Malka98's statement mirrors previous findings that VTubing can potentially serve as a productive space for identity play and experimentation (Bredikhina 2020; Bredikhina & Giard 2022; Giles 2018).

LIMITATIONS, FUTURE WORK, AND CONCLUSION

This work has several limitations. First, it is an early analysis of a small segment of the practice. R/VTubing likely attracts a certain subset of the larger population of VTubing, and the findings are not meant to be representative. Second, this is based on public internet postings related to the practice, which might not fully encompass or represent the experience of broadcasters that could be understood through deeper ethnographic analysis. These limitations speak to a need to undertake research both with greater numbers of VTubers through a more comprehensive survey of VTubers, and also through deeper ethnographic work with the population.

However, given these limitations, the present work makes several contributions: synthesizes current VTubing literature with the broader literature on streaming to frame the practice in terms of smaller independent broadcasters; it provides grounded data around the aspects of the practice that these broadcasters see as being important; and it puts the practice of independent broadcasters into an analytic context that can be built upon in future work to better understand the lived experience of VTubing as a smaller independent streamer.

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As Taylor (2018) writes in her book on streaming, *Watch Me Play*, "Looking at how people are creating experiences and content for their own fulfillment and the pleasure of others and their communities can provide insight into the complexities with which we navigate commercialized platforms," (262). Therefore, Improving understanding of VTubing as a practice can help to not only design software and platforms that support this practice, but also answer larger questions about representation and identity play within streaming as a facet of game culture (Gray 2020; Consalvo et al. 2020; Pellicone & Ahn 2017; Taylor 2018). This work represents an initial effort to build sensitizing concepts around VTubing that might serve as the foundation for future insight into how VTubers navigate the day-to-day experience of the practice.

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