Experiences of Autistic Twitch Livestreamers: "I have made easily the most meaningful and impactful relationships"

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ABSTRACT

We present perspectives from 10 autistic Twitch streamers regarding their experiences as livestreamers and how autism uniquely colors their experiences. Livestreaming offers a social online experience distinct from in-person, face-to-face communication, where autistic people tend to encounter challenges. Our reflexive thematic analysis of interviews with 10 participants showcases autistic livestreamers' perspectives in their own words. Our findings center on the importance of having streamers establishing connections with other, sharing autistic identities, controlling a space for social interaction, personal growth, and accessibility challenges. In our discussion, we highlight the crucial value of having a medium for autistic representation, as well as design opportunities for streaming platforms to onboard autistic livestreamers and to facilitate livestreamers communication with their audience.

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in HCI**; **Empirical studies in collaborative and social computing**.

KEYWORDS

autism, live streaming, autistic, Twitch

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1 INTRODUCTION

Autistic people often face challenges with societal norms that impose neurotypical communication preferences during in-person interactions [43]. Differences in how autistic people experience and communicate during these strained in-person interactions can cause difficulty in building social relationships. Online social platforms provide new mediums and opportunities for autistic individuals to communicate and socialize in ways that fit their abilities and preferences. For instance, many such social platforms allow people to participate asynchronously (i.e. not in real time), non-verbally (e.g. through text or images), or asymmetrically (e.g. some people contribute content while others contribute comments). It stands to reason that platforms that serve as a gathering point must serve the needs of individuals in the community effectively.

We look at how and why autistic adults use livestreaming as an social space. In livestreaming platforms, some users stream video content to a live audience, often including a camera feed of themselves. Audience members can interact with the streamer and each other through a text-based chat. On Twitch.tv, the most used platform for livestreaming [39], many autistic individuals now stream on a regular (for many, daily) basis to an audience that comprise both other autistic individuals and neurotypical individuals. Why are these autistic individuals choosing to livestream? How are their social needs addressed through livestreaming? And, what challenges do current social platforms present to autistic individuals? Identifying, creating and enhancing such social spaces for autistic individuals is important because it can fundamentally improve their quality of life [38]; thus, when there is such a space that has emerged organically, it serves to understand how it functions, and perhaps how to amplify its effect for more autistic individuals.

In HCI research, livestreams have been described as a "third place"; a place outside of work, like a café, where people gather to share stories, ideas, and thoughts [26]. More recent research has reported on how livestreaming is used and perceived by minority groups and those with other cultural, non-Western, backgrounds. For instance, through investigating Chinese livestreamers, Lu et al. described how livestreaming offered them a medium to share and promote their heritage [35, 36]. In another account, Gray-Denson reported on the experience of Black streamers [25]. Their work highlighted the challenges of livestreaming for minority groups as they have to deal with marginalizing comments and harassment. Our work builds on these by examining how another vulnerable and marginalized group—autistic adults—face unique challenges due to being an autistic person trying to share their interests on a public platform.

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We interviewed 10 autistic adult Twitch livestreamers about their streaming experiences, and used reflexive thematic analysis to identify and articulate the benefits and challenges faced by autistic content creators in livestreaming. This paper provides an in-depth account of autistic perspectives on livestreaming as a video-based social platform, and identifies aspects of how livestreaming platforms are designed that make them both accessible and inaccessible to autistic adults[1]. Our work follows the ethnographic tradition, where it provides the HCI/ASSETS community with insight into the social organization and motivations of activity and interaction in autistic livestreaming. Aligned with Dourish [19], our intention is to provide a model for thinking about the setting and the activities that occur there, and how they vary from conventional livestreaming. Through our analysis we present five interconnected themes that describe autistic livestreaming experiences: 1) Access to People and Social Experiences, 2) Sharing Autistic Identity, 3) Achieving Personal Growth, 4) Control of Interaction and Space, and 5) Accessibility Challenges of Being an Autistic Streamer.

In this work, we use identity-first-language (IFL), (i.e., "autistic person") rather than person-first language (PFL) (i.e., "person with autism"). As Botha et al. [8] point out, there is no consensus among researchers or autistic people, on using IFL or PFL in autism-related research; however, there is a general trend in promoting the use of IFL. We have chosen to use IFL as it acknowledges the importance of being autistic in one's life rather than focusing on autism as an impairment. Furthermore, all of our participants indicated they were comfortable using IFL.

2 RELATED WORK

First, we offer background information on autistic social experiences in both in-person and online settings. Next, we introduce background on livestreaming and discuss other relevant online social media platforms for autistic users.

2.1 Autistic Social Experiences

When engaging in face-to-face conversations with neurotypical people, autistic individuals may or may not conform to neurotypical social norms. Klin and Volkmar [33] explain how autistic people can exhibit behaviour that would previously be labelled as a 'deficit' in social communication, such as contributing to a dialogue in a one-sided manner, leaving little room for the expected back-and-forth flow of conversation. Another common difference with social communication is having atypical responses to a conversation's emotional content, such as not expressing sympathy using tone of voice [43].

Differences in social communication and understanding can lead to those on the autism spectrum feeling pressure to put on a performance while speaking with others; there is an expectation of conforming to neurotypical behaviours [28]. This can take the form of explicitly performing social actions to conform to neurotypical expectations, or suppressing beneficial actions that diverge from neurotypical norms.

However, this practice takes energy and can cause physical discomfort or anxiety for autistic individuals [51]. Furthermore, performing can include masking behaviours that an autistic person finds beneficial, such as stimming. Stims can involve repetitive and rhythmic behaviours like hand flapping, rocking, bouncing, jumping, pacing, spinning, walking on tiptoes, repeating words, stuttering, and singing. Autistic people report that stims help them feel calmer, focus, and regulate excess emotion [30]. However, the autistic people also reported experiences of neurotypical people ignorant of the purpose of stimming, finding these actions disruptive to conversations. Thus, in addition to the challenge of understanding others, autistic people also experience pressure to change their behaviour—this results in the inability to present their true selves while speaking with others [51]. In person, all these differences can make it difficult for autistic individuals to connect socially [43].

Social engagement and support networks are essential to a person's well-being, but these can be difficult to access for those on the autism spectrum. Autistic adults report a lower quality of life (QoL), often linked to social challenges and co-occurring mental health conditions [12, 38, 43]. Some of the factors that negatively influence the QoL of autistic adults include not having supportive relationships [38], experiencing isolation and social exclusion [43], masking one's true self during social interactions [15], and anxiety and depression [28].

Past work suggests several ways in which autistic adults can improve their QoL. Mason et al. note that access to informal, supportive relationships can positively impact QoL for autistics [38]. Cage et al. [12] report that feeling accepted by others as an autistic person may play a part in protecting against depression and that personal acceptance also predicted reduced symptoms of depression. Cooper et al. [15] suggest that having a positive perspective on one's autistic identity could also combat mental health difficulties. However, being on the autism spectrum means significant differences in how someone participates in face-to-face social situations, which can limit in-person access to these benefits. Autistic adults seek social connection but, unfortunately, report higher scores on measures of loneliness compared to non-autistic adults [52]. Elmose et al. [20] point to improved social interactions for autistic adults that have access to environments that let them share their interests, feel a sense of safety, and have recognition and acceptance.

Previous research has identified various factors that may improve the quality of life for autistic adults. For example, informal, supportive relationships have been found to impact the well-being of autistic individuals positively [38]. Feeling accepted by others as an autistic person may also protect against depression and reduce symptoms of depression [12], while having a positive autistic identity can combat mental health difficulties [15]. However, due to differences in social communication and interaction, autistic individuals may have limited access to these benefits in face-to-face social situations and often report feeling lonely compared to non-autistic adults [52]. To address this, sharing interests, feeling a sense of safety, and gaining recognition and acceptance may help improve social interactions for autistic adults [16].

2.2 Livestreaming and Online Social Platforms

While autistic individuals encounter challenges in face-to-face social communication, alternative social spaces offer opportunities

[1]This work extends the findings from [42].

for meaningful connections where neurotypical face-to-face communication norms no longer apply. Livestreaming sites have become one such environment where some autistic adults are participating. Livestreaming may provide autistic streamers with a non-traditional interaction dynamic that serves their needs and preferences more effectively. For instance, they can control the stream of "incoming" social information from their viewers. Yet the reality is that livestreaming presents both unique opportunities and challenges for autistic streamers. Therefore, it is crucial to explore how currently active autistic streamers engage in this digital space.

There is reason to expect that autistic people have distinct experiences in online spaces, and understanding these experiences can help design better platforms to suit their needs. Past work has shown that autistic users experience computer-mediated communication, like Facebook and email, differently than non-autistic users [24, 40, 53]. For example, they have a more positive view, as compared to controls, on being able to take time to form and edit their communication on asynchronous text-based platforms. autism support groups on other social media platforms like Facebook and Twitter serve as spaces for autistic individuals to seek support and connection with their peers [4, 11]. For instance, on Twitter, empowerment and support were the most common themes in messages posted by active members of autism-related communities [7]. In some cases, mediums such as video-games like Minecraft have offered autistic users with alternative communication affordances through devices such avatars and non-verbal gestures while also fostering a supportive community environment [46–48].

We build on this by giving the first account of autistic perspectives on livestreaming as a video-based social platform. With our work, we explore how autistic users experience livestreaming, how it benefits them, and what challenges they face with streaming due to being autistic.

3 METHODS

Here we report on our initial work through a formative process of observation and engagement with autistic livestreamers. We then explain our participant recruitment methods, followed by a description of our interview protocol. Finally, we provide an overview of our qualitative analysis of the participant interviews.

3.1 Formative Process

Ultimately, our goal was to interview autistic livestreamers to hear about their motivations, challenges, barriers, and benefits to participating in livestreaming. However, we wanted to approach these interviews and develop our interview guide from an informed perspective. To familiarize ourselves with the nature of livestreams among autistic creators, the first author participated in the livestreaming community .

The first author engaged by watching autistic livestreamers on Twitch.tv[2], interacting as an audience member, and joining publicly listed streamer Discord channels. In total, the first author observed 31 autistic streamers for approximately 17 hours. Viewer counts for streams were highly varied, ranging from 3 to 400, with an average of 62 viewers.

We also took a periodic sampling of the number of streams using autism related tags such as #autistic, #autism, and #autisticstreamer to roughly determine the number of autism related streams and viewers of those streams. There was an average of 272 streamers using these tags ($min = 163, max = 360$) with an total viewers across all streams averaging 6466 ($min = 2479, max = 11212$).

Approach. We first began to find autistic creators by searching the 'autistic' and 'english' tags on Twitch.tv. We then chose the streamer with the highest viewer count that we had not already viewed in previous sessions. At a later stage in our study we became aware of the website peer2peer.live, an opt-in identity-based tagging tool for marginalized streamers. Some creators used this site to list their livestream with the 'autistic' tag, even when they did not use that tag on Twitch. We followed a similar process of finding streams on peer2peer.live, searching for those tagged as 'autistic', then choosing the streamer with the highest viewer count to observe if they also had the 'english' tag.

After choosing a stream to watch, the first author observed for at least 30 minutes while taking notes on the stream's content. Although streams and audience communication are publicly accessible on Twitch.tv we chose not to record any video or communication at this time. Instead, the author took field observation notes about the streamer's content and their interaction with the stream's audience members. Additionally, we kept metadata such as the type of content (e.g., Video game, Just chatting, Arts), number of viewers, the stream's tags, whether the streamer's camera was visible, and if the streamer was using a virtual avatar.

While watching, the first author occasionally interacted informally and casually with the streamer or other audience members through the text chat. If the streamer discussed research or autistic livestreamers, the first author disclosed their role as a researcher and mentioned that we would be doing future research regarding autistic streamer's experiences on Twitch. We did not ask these streamers to participate in our research during this formative process, and instead contacted them at a later time according to our recruitment protocol described in the following section.

Outcomes. Overall, autistic content creators appeared to broadcast similarly to non-autistic streamers. They actively engaged with their audience and had regular viewers, covering a wide range of content such as video games, arts and crafts, music, and political discussions. Like non-autistic streamers, autistic streamers were individuals with unique content, communication styles, and demeanors. However, they frequently discussed serious topics like mental health and autism, potentially distinguishing them from typical streamers.

Nonetheless, autistic individuals are sometimes considered to have "invisible disabilities" in that the challenges they face are not always apparent to others [22]. We cannot fully understand the inner emotions and perspectives of autistic streamers without engaging with them directly. Bearing this in mind, we planned our interviews to delve deeper into the first-hand experiences of autistic individuals in the context of livestreaming.

[2]We focused on Twitch.tv as it is the largest streaming platform by market shareTwitch 73%, YouTube 21%, Facebook 3% via https://streamscheme.com/twitch-statistics accessed July 7, 2023

3.2 Participants

We recruited 10 autistic streamers through ads posted on social media and purposive sampling. In our purposive sampling process, we contacted potential participants based on their publicly posted Twitch.tv profile's contact information. As in our formative observations we searched the tags 'english' and 'autistic' to find potential participants. Our interest was not focused in problem finding, but rather on understanding the experience of livestreaming. Thus we recruited active streamers.

We began by looking at the streamers who had the most viewers. We then directly contacted those that identified themselves as autistic in their Twitch profile and had a private way to contact them listed. Overall, we directly contacted 20 streamers; 10 responded and agreed to participate in our study. We received no response to our ads posted through social media. We selected a narrow set of active streamers to establish a starting point. This choice does restrict the generalizability of our work, but our goal was to offer a foundation for further exploration. By doing so, we provide a basis of comparison for future studies that delve into autistic experiences on different platforms.

All participants were adults between the ages of 25 to 38, with 5 from the United States, 2 from the United Kingdom, 1 from Canada, 1 from South Africa, and 1 from Finland. Participants had all been streamers on Twitch for multiple years (range: 2-5 years). As described in Table 1, participants' streams covered a wide range of content, including various games, co-working and co-study, just chatting, crafts, and performing arts. Of these ten participants, nine elected to attribute their responses to their Twitch handle with one wishing to remain anonymous. Participants were remunerated with a $30 CAD gift card.

3.3 Interviews and Interview Guide

We constructed an interview guide in consultation with two members of the autistic livestreaming community who did not participate in the interviews. The guide provided some structure for the interviews, though participants were free to discuss any topics related to livestreaming and autism. The high level topics included in the interview guide were: Livestreaming Experience, Likes and Dislikes of Livestreaming, Interacting with Your Chat, Conversation Topics on Stream, Interaction with other Livestreamers, Presentation, Autistic Behaviours/Traits and Other Activities Related to Streaming. We provided participants with an overview of our interview guide before the start of the interview, which included the high level topics and sample questions for each topic.

Participants chose the medium for the interview. Seven chose video chat (platform: Zoom, Discord); one chose a voice-only interview (platform: Discord), and two chose text-only interviews (platform: Discord, Twitter DM). Prior to interviewing participants we expected that the audio/video interviews would take approximately 90 minutes based on our interview guide. The eight audio/video interviews averaged 1h:55m (range: 1h:41-2h:31m); the text interviews took place over several days and were 3081 words and 5985 words in length, respectively. The audio/video interviews took longer than our initial expectations, however, during the interviews we regularly checked-in with participants to see if they needed breaks and were comfortable continuing with the interview.

We transcribed each interview within one week from the interview taking place and sent the transcription to the participant. We gave them the opportunity to change or redact any portion of the interview transcripts. Through this process one participant chose to have a short portion of their interview removed prior to our analysis.

3.4 Interview Analysis

We used reflexive thematic analysis (RTA) [9, 10] to guide our interpretation of the data. We chose RTA as it outlines an open and flexible process to include our participants' perspectives as well as our own interpretation of participant interviews regarding existing livestreaming literature and author subjectivity. In contrast, to other common qualitative analysis such as coder inter-rater reliability and creating "code book" RTA understands the data to be open to multiple interpretations and that coding, organizing, and creating themes is subjective according to the researcher(s) performing the analysis.

Following RTA let us be "open, exploratory, flexible, and iterative in nature", as described by Braun and Clarke [10], in our investigation of autistic people's experience of livestreaming. This was important as our own knowledge and understanding of the data and of autism has grown and changed from when we first began. In our analysis, we focused on the impact of autism on the streamers' experiences.

Braun and Clarke describe a range of approaches to RTA, illustrating the degree to which existing concepts or ideas influence the coding and theme development process. We started by coding participant quotes inductively and semantically, staying close to the data to maintain the integrity of participants' perspectives and their accounts of personal experiences. As we developed themes and reported our findings, we also adopted a more latent approach to analyzing the data. This enabled us to contextualize quotes within the broader understanding of autistic individuals' social experiences and reflect on relevant concepts, such as "third places," which are often used to describe livestreaming. [26].

The first author transcribed all interviews, performed repeated readings of the interviews, open coded interview transcripts using NVIVO 12, and developed potential themes through a repetitive and iterative process of clustering and grouping codes. Through repeated discussion of the codes, participants quotes, and potential themes with co-authors, we developed a set of candidate themes. As we wrote this paper, the candidate themes evolved into the final set of themes we present, which involved reorganizing, renaming, and incorporating several subthemes. The analytical output from RTA are the themes and subthemes that reflect our voice in the work by how we organize ideas, how and what we chose from the data to present, and our references to place themes and quotes in relation to existing HCI and autism literature.

Following the suggested process of reflexive thematic analysis, we did not seek saturation in our analysis. Instead we ended recruitment when we felt substantial insights were available from reflecting on our existing interviews. This is in line with Malterud et al. who suggest that qualitative interview studies can be led by "information power" rather than saturation [37].

Table 1: Interviewed participants. Streams available at *https://twitch.tv/[Streamer]*
P6 wished to remain anonymous.

Streamer	Pronouns	Years Streaming	Presence on Stream	Typical Stream Content
ArenEternal	she/her	4	On camera	Plays rhythm music games.
ruthy0nfire	she/they	3	On camera	Plays a variety of games. Just Chatting
Ayymart	he/him	3	On camera	Performs speed runs of role-playing games (RPGs). Commonly runs charity drives on stream.
JaneTheMessage	she/her	5	On camera and virtual banana avatar	Streams autistic support groups, feminism discussions, and performance art.
Kennethiain	he/him/they	>10	Virtual squirrel avatar	Mostly plays the game Dead by Daylight but also plays a variety of other games.
P6*	she/her	3	On camera	Host virtual co-working and co-study groups.
NeroKoso	he/him	3	On camera	Typically plays the games Lost Ark and Blade & Soul.
psoymilk	they/them	2	On camera	Plays a variety of games. Also does artwork crafts such as knitting.
ThatWelshKaren	she/her	2	Occasionally on camera	Plays a variety of games.
RowanAster	they/them	2	On camera	Streams reading a variety of materials including books and articles. Also streams RPGs.

3.4.1 Positionality Statement. All authors are non-autistic researchers; we recognize that our experiences and perspectives have influenced our analysis and interpretation of the findings. We also acknowledge that three of the four authors possess little prior autism-related research experience. In alignment with this, we have tried to adhere to the neurodiversity perspective of autism, rather than a medical or pathologizing perspective. This is not only reflected in our language choices in this manuscript, but also in our efforts to explore livestreaming as a potential positive computing space for autistic individuals, rather than focusing on training tools or technology aimed at changing autistic people.

Lastly, as the first author I have been guided by being a parent of a child on the spectrum. Through this, I have seen her participate in a local autism support foundation that focuses on giving autistic youth and adults in-person community-based experiences with other autistic people. Seeing her and others benefit from being a part of that community has motivated me to explore other potential opportunities for autistic people to flourish, as demonstrated with this work.

4 FINDINGS

Our participants provided numerous stories about their streaming experiences. While many of these align with previous research, such as building community or forming new relationships through streaming [26], here we focus on the impact of autism on their streaming experience and highlight the unique perspectives that autistic streamers bring to the world of streaming. We present five intersecting themes that report on the experience of livestreaming for autistic adults: (1) Access to People and Social Experiences, (2) Sharing Autistic Identity, (3) Achieving Personal Growth, (4) Control of Interaction and Space, and (5) Accessibility Challenges of Being an Autistic Streamer.

A Note on Participant Quotes in this Work. For several reasons, we present longer quotes from our participants than typical for HCI literature in the presentation of our findings. First, we aim to preserve our autistic participants' perspectives, ensuring that autistic representation is considered in autism-related research. By providing more space for participants' voices, we strive to remain faithful to their intentions and balance the fact that none of the authors are autistic. Second, past work indicates that some autistic individuals engage in "one sided monologues" during conversations [23, 44], which was evident in how some participants answered our questions with lengthy responses. We take the view that our participants sought to thoroughly explain and describe their thoughts as autistic individuals to us as non-autistic listeners. Finally, our aim is to we give readers the opportunity to interpret the participants' words for themselves (as an additional check of whether we captured our respondents' intentions). We add **bold styling** to emphasize how the quote ties to the themes we identified in our analysis.

4.1 Access to People and Social Experiences

Streaming gave our interviewees access to people and social experiences they felt were largely unavailable to them without their stream. We report on these experiences through two subthemes: *Being Part of a Community* and *Building Relationships*.

4.1.1 Being Part of a Community. An important motivator for starting and continuing to livestream for all of our participants was to be part of a community. Several streamers expressed that livestreaming was an important place to build connections with others. In some cases, they felt that this was one of few places they

could be part of a group and feel comfortable. Twitch communities manifest in various forms. The community our participants most frequently mentioned was their own Twitch channel, which consisted of themselves as the streamer and their immediate audience. Other instances of communities involved connections with fellow Twitch streamers or being part of a wider community focused on a specific type of video game or streaming genre.

When asked about why she streamed, P6 told us how she was inspired by the companionship she saw in another stream: *"I was like, wow, all these people are chatting with her. She's talking about what she's doing and they're encouraging one another. And I felt like, oh wow, it seems that she's not as alone, she has companionship, and that's what I really wanted."* P6 further explained that she continued to stream in part to address feelings of loneliness. Streaming enabled her to have a community and feel a connection with others that was otherwise lacking in her life.

> *P6*: "**Connection mostly and not feeling alone.** That is a common feeling I feel, especially ever since receiving my diagnosis, my late diagnosis, I've been able to pinpoint this feeling a lot more frequently and purposefully. **So, just having community and connection that often times I lacked.** So, that was I think a big part of it. And being able to be there for someone [in a co-study stream], like, I'm here and another person can be anywhere across the world or the next town over. That aspect of being anonymous in a sense was very intriguing. Because we could be working towards a similar goal but yet be completely different. I don't know, I really enjoy that part."

P6, a university student, was able to integrate this online community into her everyday practice as a student. Much like how students may work in coffee shop, alternating between studying and chatting with others, P6 streams a genre called "co-study" or "co-work" where the streamer films themselves studying or working. Here, P6 takes periodic breaks from her studying to check in and chat with viewers. The intent of this genre of stream is to have viewers studying or working at the same time as the streamer, and for everyone to feel a sense of togetherness and achievement through completing tasks. Working alongside viewers with similar goals made her feel connected to them.

Streaming routinely over a span of years led to some of our streamers developing a community of dedicated long-term audience members. This reflects prior work that describes the importance of "regulars" that establish a sense of community in a livestreamer's channel through "familiarity, recognition, and history" [26]. Having regular and repeat viewers helped create shared experiences and strengthen connections between members of the community, as NeroKoso explained.

> *NeroKoso*: "So I guess it's like, harder to approach me, but the ones that actually do that, they will stay for a long time. At least the ones that are, like, active in chat. Like, there's so many people that have been there for three years. It's nice that they come in there and they hang out. Like, it's something familiar, like, you know, they, they will be there. It's hard to explain. [...] **Like there's these old viewers, like, we have our own stuff going on. And our inside things.** [...] Once you have the viewers that are kind of on the same level as you then there is all the jokes and **we will understand each other**."

NeroKoso expressed concern about the difficulty new viewers faced when engaging with his community. However, he appreciated the sense of familiarity created by long-term viewers being a part of his stream. Additionally, ArenEternal told us that having regulars led to a supportive community that empowered her to disclose that she is trans on stream.

> *ArenEternal*: "I'm not super big on the platform, so my chat is still at the size where I can interact with almost all the messages pretty well and get to know my regulars. I think the most positive memories I have are the two times early on in my first year of streaming where I did a big reveal. **The first one was me coming out as trans on stream. And everyone in chat was just so supportive and incredible about it.** It was a lovely experience."

Some of our participants discussed connecting with other autistic people including other streamers, other viewers, and their own audience. As P6 explains, in some cases audience members in her stream shared that they were also autistic: "But a lot of my viewers over time become comfortable sharing their own diagnosis, and that within itself helps a lot with that community aspect of it and not feeling as lonely." When discussing community on Twitch, RowanAster described how connecting with other autistic streamers let them "*support one another in achieving our goals*" and went on to explain that it played a part in their journey of understanding their own autistic identity.

> *RowanAster*: "We had tried to start, umm, like an autistic panel. At this point I still didn't have my diagnosis, but I had had some really in depth conversations with my friend [another autistic streamer] and many other autistic streamers, and without openly using the label I was pretty confident that I was autistic and was in the process of seeking a diagnosis. So we, you know, had tried to create like an autistic panel, umm, where autistic people could speak about their experiences, we could kind of focus conversations around helping people to find support."

In part, platform affordances of Twitch and peer2peer.live facilitated some connections with other autistic individuals. Streamers can add text tags to their stream to categorize their content and make the stream show up in user searches. All of our streamers used the "autistic" tag for their streams. This let our participants publicly share that they were autistic to viewers and opened the door to discussion of autism and being autistic. Ayymart described how they fostered communication and community around autism when we asked why he chose to the use the autistic tag.

> *Ayymart*: "So, I didn't used to put the autistic tag on. So the reason why I changed was, I already had an indicator, so below my stream where you can watch, I actually have a panel. I actually say that I have autism and if anybody had any questions or wanted to talk

> about, like, maybe they are also a person who has autism or knows somebody who has autism and they don't really know how to handle it. I'm always, I'm always glad to talk about what it's like to have autism."

Some streamers built community through these open discussions of topics such as autism and mental health. ruthy0nfire told us how she first began streaming "on a dare" but quickly became motivated to continue by participating in open and honest conversations around her own mental health and being autistic.

> *ruthy0nfire*: "[...] talking quite honestly and openly about my mental health, being autistic, and that sort of thing. And people were saying that they really loved having a space where they could come and ask questions and communicate quite freely about that sort of thing without judgement or fear of misunderstanding."

Overall the importance of being a part of a community through livestreaming is in line with previous research [26]. The distinction for some autistic individuals is that they may lack access to traditional in-person third places like a café or church due to in-person social interaction differences or sensory issues. Many autistic people deal with challenges accessing in-person social experiences leading to feelings of isolation and exclusion [43]; being a streamer was a way our participants could take control of the situation and address the need or desire to be part of a community.

4.1.2 Building Relationships. The relationships described by our participants in this section reveal a more intimate connection with specific individuals within their communities. These friendships became deeply established, supportive connections, and some initially online relationships led to in-person meetings. Through their streams, participants gained friends with whom they felt deeply connected to and supported by.

ruthy0nfire developed friendships with several viewers who later became their stream moderators, who helped manage communication in her stream.

> *ruthy0nfire*: "I have five or six mods. Two of them are pretty much ever-present. I actually sometimes wait for them to pop up in my house somewhere when I do something. I can actually hear them in the back of my mind. **Very close friends, very precious people.** The others are not always present but **somehow when the bad things happen they somehow know and just appear**. Like, ah, the mod has been summoned. They've been very very awesome."

This account of her moderators' ability and willingness to defend her in times of need demonstrates a profound personal bond. These types of supportive relationships seem well-aligned with the kinds described by researchers who have identified supportive relationships as being predictors of well-being among autistic individuals [38]. The kinds of relationships ruthy0nfire depicts align with those that Cage et al. describe as being relationships that protect against depression and reduce symptoms of depression [12]. Such individuals help ruthy0nfire with a sense of security and significant emotional support.

Additionally, ruthy0nfire told us that prior to streaming, she found it difficult to make friends despite the desire to do so.

> *ruthy0nfire*: "One of my special interests as an autistic person is psychology. I started studying 'round about when I was 9 or so. I was really trying to understand people and make friends. **I desperately wanted to be social and have friends and I just never connected with people that way.** Now I obviously understand why, but then I was like, I don't know what I'm doing wrong. So maybe if I understand how brains work, I can understand how people work. And I can hack that, or something"

Other streamers shared similar sentiments that the friendships and relationships they developed through streaming were not only important but also unavailable to them without streaming. RowanAster explained:

> *RowanAster*: "I have made easily the most meaningful and impactful relationships with people through this platform in my entire life. I've been able to receive support from people and feel cared about and seen in ways that I didn't think was possible. [...] **I didn't know that that's what friendships and relationships with people could be like because I'd never had them before.** I never really knew that there was a way for me to be so open and communicative with people and feel as though I have an honest connection with them."

In other instances, finding people similar to themselves through streaming was helpful in building friendships. Live streaming provided participants the opportunity to build relational bonds over shared identities. In some cases this was bonding with other autistic people, as JaneTheMessage told us.

> *JaneTheMessage*: "**I just have met very important people that are my friends now that are autistic or neurodivergent in a way that there is overlap**. And also, my boyfriend who I'm really serious about, and his brother has autism that's like, level 3. **I wouldn't have met any of these people without it** and prior to this my social engagements were around my music or dance or something. [...] So it, it really changed my social life in a way that I greatly value. Some of the people that were friends of mine that were a little bit closer have joined into the audience and my Discord. So I'm able to meet people on my terms more, and I have better quality relationships from that, and then at the other end, even though you meet these really fantastic people that, you know otherwise it's just hard. Like, I'm a weird person, so it's hard to find people that have that kind of overlap."

In some cases connections made through streaming led to in-person meetings. Based on our participants' descriptions, it is clear they attribute these encounters to the relationships that were built through their livestreaming experiences; that is, they were unlikely to have happened without the platform enabling them to build these relationships online.

> *JaneTheMessage*: "I was mentioning too, like my friend [name removed], who is the first person I've met who's almost my exact age and a woman and diagnosed around the same time, so we have all these parallels that I've never gotten to experience. She came over—she lives in a different state—and she visited, like, two weeks ago. Stayed over here for four days, just ran around. **Like, having a friend that I had so much in common with. So that's new.**"

> *Ayymart*: "I've taken a vacation with my wife, we went to Florida for the first time where we met one of my mods. One of my first mods. One of my first Twitch friends that I made on here. Well, one of the first friends I made on Twitch. And we met him and his partner and we went and had dinner. And it was part of our vacation that we were planning on taking. So it was really cool to get to have that experience. I did get to go to. I go to a *Magic* [*the Gathering* card game] tournament–and this was after I got into speedrunning–with some friends because they were also taking a vacation. And I met some content creators that I had met through *Magic* at that tournament. [...] And we just played games and also got to go out and have dinner. **And just meeting all these people that share passions is really awesome**.

We see that livestreaming created opportunities for our autistic streamers to both belong to communities (which, as streamers, they created and maintained), and to engage and build new kinds of relationships with others. In simple terms, livestreaming allowed them to fulfill social needs that had been previously unaddressed. As we will see, these opportunities are afforded by the unique interaction dynamics afforded by the livestreaming platform (such as the asymmetry of interactions available to the streamer and their audience), which in turn gave our participants a space to socially grow that they would not otherwise find in conventional face-to-face situations.

4.2 Sharing Autistic Identity

Our streamers found the opportunity to publicly share their experiences and perspectives of being autistic to be very powerful–both in their ability to represent the autistic community, and the experience of being their true, authentic selves in a social setting. We describe this through two subthemes: *Autistic Representation* and *Unmasking*.

4.2.1 Autistic Representation. Having a space to be autistic enabled participants to feel they could be a positive representation of an autistic person. For our participants, livestreaming empowered them to publicly showcase their own individual identity, qualities, characteristics, and lived experiences. In some cases the streamers further explained that they lacked autistic role models or opportunities to see others like themselves in their own lives.

> *psoymilk*: "It's now that I'm kind of a role model and a positive representation in spaces that aren't usually positive for people like me."

> *ruthy0nfire*: "And I just didn't see anyone like myself in the industry [...] this could be something to do. Because there's nothing more inspiring than being able to see someone like you doing something you love."

JaneTheMessage in particular had much to say about seeing representation of autistic people through livestreaming. She aimed to show other autistic people, especially autistic women, her personal experience of being autistic. JaneTheMessage believed it was essential for autistic individuals to understand they could be diverse and entertaining without conforming to neurotypical norms of autism. She also explained that livestreaming, as a video-based medium, allowed her to demonstrate skills such as dance, rap, and improv; things not typically associated with being autistic.

> *JaneTheMessage*: "I think that autistic people often, like I mentioned, they don't have the same milestones in life. And I think that we can start to feel very insecure about ourselves as adults. Like, I've lived a very interesting life but I've needed more support than other people. The things that I wanted to do didn't always make sense to others, and I do have a lot to offer, but pulling it all together can be very difficult. And something that's helped me is when I was researching about women on the spectrum and people diagnosed as adults, a particular presentation I saw was talking about how many of these people have to invent their own careers. Like, they had to invent their own job title. Be their own boss. And then they were happy with what they did with their lives. **And I think it's very important for autistic people to see the variety of lives that will work for an autistic.** "

> *JaneTheMessage*: "When I was a kid I didn't have any role models, and that's been a big stressor in my life, is just not knowing if I belong in the world. I think a lot of autistic people feel like aliens, not because we, we don't feel human, it's because we don't see humans that look like us. So I want to be a role model. [...] **A lot of autistic people don't know what it looks like to age as an autistic person**. We just don't see adults and see us go through different life stages. And not be able to conform, but that doesn't mean we're just sitting on our butts doing nothing. Like, a lot of us have really rich relationships with aspects of the world that are interesting and **if we had a place to share about it we would probably be more encouraged to keep going**. And that's what I hope streaming will do for me."

> *JaneTheMessage*: "Yeah. **I think that my presentation is so underrepresented** that like when people meet me they're mostly like kind of confused. I get more the, "you don't look autistic" sort of response. And I'm pretty, I lead with my being autistic a lot because I want people to know, "hey, you're going to notice things". And instead of you explaining it

> with some narrative about who I am and my personality and social information, I have autism. So this is a presentation that you're not used to seeing. [...] And some of the more positive stereotypes about autism aren't usually applied to women."

For our participants, livestreaming created the opportunity to go beyond coming to terms with their identity as autistic individuals—it allowed them to embrace this identity. As streamers, they have a sort of "celebrity status," and streamers like JaneTheMessage see the value of doing this to be a representative (or role model) for other autistic individuals. Beyond representing herself and her autistic identity, she represents autistic individuals as a member of this broader community—within her own social community, as well as within the broader streaming community. As such, they have dual roles as autistic streamers: first, to be streamers—people who share some aspect of their lives online with a small community, and second to be *autistic* streamers, where their role is to share their autistic identity to others.

4.2.2 Unmasking. Autistic people often feel pressure to suppress or change their behaviours in social situations when dealing with non-autistic people [30]. This pressure to hide their true selves was still felt by some of our streamers, while others were able to express themselves freely, such as by stimming, during their streams. However, for those who continued to mask their autistic traits, the frequency of doing so decreased over time. For instance, ArenEternal told us that she sometimes stimmed on stream but still considered her presentation as "slightly masked" because she felt it was "ingrained to mask when others are around". When asked to elaborate regarding stimming on stream she explained that "many of my chatters [audience members] assure me that is okay to stim, and that I shouldn't prevent myself from doing it if I need to. So I've been getting more comfortable with that."

The streamers also discussed how livestreaming let them unmask in other ways, such as expressing emotions in their preferred manner. Psoymilk shared that she had experienced pressure from others to exhibit more emotion with her facial expressions–both on and off stream—even though she preferred to convey her feelings verbally. However, over time, her stream became a space where she felt comfortable behaving authentically.

> *psoymilk*: "I think my fondest memory, like, December of last year was a great month for me for streaming. [...] I kind of, like, had this philosophical "oh wow" moment about how I should be streaming and then **I stopped basically masking how I felt and how I wanted to be.** [...] And then December was the most validating time for me because I had so many new people come into my stream and tell me how much they loved seeing me be me."

4.3 Achieving Personal Growth

Our streamers attributed growth in various aspects of their lives, such as improved communication and adapting to new situations, to their streaming experiences. We report on this through two subthemes: *Benefits Away from the Stream* and *Interacting with the Unfamiliar*.

4.3.1 Benefits Away from the Stream. Participants saw their livestream as a safe place where they could practice neurotyipcal social interactions such as engaging in "small talk." In some cases they explained that being able to interact in these neuorypically expected ways was beneficial to them outside of their stream.

NeroKoso told us that interacting with his neighbours and strangers had become easier because of the practice he had talking to his audience on stream. He also reflected on his participation in this study saying that it would not have been possible prior to his streaming experience.

> *NeroKoso*: "So, when I was taking those dogs out, so many random people would come and talk with me, and I noticed it was way easier to talk with random people now versus, like, three years ago. And, for example, this call [interview] wouldn't have happened three years ago. Definitely, it would have been that difficult. [...] Only because of the streaming. It's the practice. Like, you just, you just basically have to do it. And you just have to keep doing it. It's just constantly challenging yourself. And then it's part of that—later on you will think "should have said this instead of that". Like, eventually you will learn. It's like playing chess. It's like, you have these moves. But it just doesn't come natural. Like, you just have to have preworked answers to everything and to basically react to different situations. And you have this specific model that you follow on those situations."

Earlier in our interview, NeroKoso mentioned that his anxiety surrounding "small talk" occasionally discouraged him from performing routine tasks, such as taking his dog for a walk. However, through streaming practice, he became more at ease in these situations. In one instance, this allowed him to connect with a neighbor over their dogs, and at the time of the interview, he was dog-sitting for them.

Another streamer, Ayymart, discussed his growing confidence in interacting with his stream audience. To follow-up, we asked him whether he noticed any changes in his social experiences outside of his stream. In response, he explained how his practice with talking on stream positively influenced interactions with his wife. Regularly engaging in conversations during his streams allowed him to become a more engaged and active conversational partner with his spouse.

> *Ayymart*: "I would definitely say streaming has played a huge part. Even in my social life, like talking with my wife. You know, bless her heart. I'm sometimes not the most talkative person and she's like a social butterfly. Like, she'll talk to anyone about anything. And I would say I can kind of, I've gotten better about being able to talk about anything that she's talking about, Even when we're out, yeah, back when we were dating I would just kind of ball up and I'll just go stand over here. I'm just going to listen to the conversation. **And now I can take part.**"

Participant 6 appreciated that streaming helped her become more self-assured and less affected by others' opinions. She also

found that her ability to take charge had strengthened through her streaming practice.

> *P6*: "Yeah, I think maybe it's [streaming] made me a lot more confident and have a certain trait to myself where I care much less what other people think and have to say. So, I don't know. To be that self assured. Is it okay? I think, public speaking. I hate public speaking. I'll get up there and try to public speak and I will just like cry and still try to get through it. I haven't had that experience, that exposure to do that because distance learning but I think that I will be a lot more comfortable. And the instances where I've had to do more work related things, or sort of like step up and do something about something, I've been a lot quicker to act on those things. Like introductions for work related things or like at family gatherings. I'll be like "this needs to get done, no one is doing it." I've been more, a straight dash to what needs to get done and not waiting so much for someone to say "this needs to be done, who wants to help?" or not waiting for someone to tell me. So just taking a lot more initiative has helped a lot. Because of confidence. Because I am streaming and putting myself out there in that sense. It's helped me in that sense."

4.3.2 Interacting with the Unfamiliar. Participants felt that streaming resulted in positive exposure to new situations and people. Our streamers engaged in experiences they otherwise might not have pursued or have had access to. For them, streaming opened up entirely new opportunities for interaction and novel experiences collaborating with others.

> *ruthy0nfire*: "Just building empathy, because that is something that I think autistic people in general do struggle with a little. It's like a common thing, we hear autistic and you think lacking empathy. It's not necessarily the case, I think it's just for most people it's something you have to build. You have to communicate with others, you have to listen, you have to expose yourself to people that are different to you in order to learn and embrace and understand. And this has definitely expanded my horizons in that way a great deal."

Such new situations and encounters included interacting with others outside of their own special interests. Ayymart described that prior to streaming one of his main ways of being social was through playing the card game *Magic the Gathering*—a passion of his—at in-person events. He felt this narrowed his ability to talk about things outside of his own interests. He appreciated that streaming provided a platform to participate in other communities and helped him improve his ability to engage with people on various topics.

> *Ayymart*: "Really through streaming and through being involved with other communities now. Different communities talk about different things. So, really it's helped me improve being able to talk about multiple topics, some of which I'm not even, I'm not completely passionate about but like I have at least an understanding of how to converse with that topic."

The streamers' interactions with others also branched out into larger project collaborations and attending larger events.

> *ArenEternal*: "Also I've had chances to work on collaborative projects and take part in events that have been a lot of fun and great learning opportunities. [...] I honestly believe I've grown a ton as a person over the last several years purely because streaming has given me a ton of experiences I never would have had otherwise."
>
> *ruthy0nfire*: "So for Comicon Africa we had a small creators convention at a gaming lounge here in Cape Town and that was really cool. Got to meet some of the people that I've interacted with in the Twitch space so much but never got to see in real life so that was very exciting."

Such experiences reflect on the transformative opportunities afforded to these livestreamers because of their role as autistic livestreamers. They stand out in part because they are large events, but also because they would likely have not been available to these individuals aside from their having built and interacted with unfamiliar circumstances and individuals precisely *because* they are autistic livestreamers. This resonates with Abel et al. [4]'s account of social opportunities created by social communities for autistic individuals, and shows how these online social opportunities create new real-life opportunities as well.

4.4 Control of Interaction and Space

In an autistic streamer's channel, they control the social space: they choose what video and audio is delivered to viewers to represent themselves socially. They are also have power over the chat as they are able to ban or timeout viewers from communicating and delete messages. Additionally, because they are the central focus of the stream, they act as a model of behaviour, setting the tone, pace, and topic of conversation.

Prior work has shown that autistic individuals deliberately manage their video calling experiences to cope with sensory, cognitive, and social stressors and needs [56]. Autistic streamers' control of their channel may assist in things such as stress management and feeling comfortable while streaming.

For our streamers, having control of their channel made it a safe place as psoymilk told us, "I had this space where I was comfortable socializing the way that I wanted." When someone is negative, abusive, or exhibiting bad behaviour streamers have the ability to remove them without needing to engage further. ruthy0nfire and Kennethiain both explain how this benefited them when they were experiencing a difficult time and had to deal with negative viewers.

> *ruthy0nFire*: "It depends heavily on my mental space at the time. If I've had a really difficult day, and I'm feeling like the meltdown[3] ceiling is very close like a pressure cooker, then I would probably just ban them just straight away, because I know I would probably

[3]Autistic meltdowns as described by autistic individuals include *"feeling overwhelmed, experiencing extreme emotions, losing logic, grasping for self-control, and minimizing social, emotional, or physical harm by avoiding triggers or self-isolating"* [34]

> not have the capacity to go back and forth on anything."
>
> *Kennethiain*: "I had no patience this particular day, I was like "ban them, get rid of them, go away"."

Streamers also have assistance controlling their space through chat moderators [49, 54]. Moderators in Twitch chat are selected by the streamer to have an elevated status in the chat and additional control such as being able to ban other users or delete their messages. Additionally, moderators can be identified by a special badge shown next to their name in the chat window.

The streamers see their moderators as a reflection of their own values, interest, and preferences. This is important since moderators can greatly impact the environment of a streaming community as viewers often imitate moderator behaviour [49]:

> *Ayymart*: "So for me it's people [moderators] who I feel are a good extension of the brand that I'm trying to build. Which is a wholesome safe space community that also is willing to help people who want to get into speedrunning or stuff like that. The people who, and also I would say, the people who I've built a trust with over many years. But for the most part I would say everyone who is a moderator in my stream I consider a great extension to my own personal brand and someone who I could definitely leave the stream with and trust. Like, you know, keep it that way."

4.5 Accessibility Challenges of Being an Autistic Streamer

While streaming overall was a positive part of our participants' lives, it was not without difficulties. We describe some of those challenges here through two subthemes: *Dealing with Negative Viewers* and *(Livestreaming) Social Interaction is Draining*, with a focus on the struggles of being autistic on Twitch.

4.5.1 Dealing with Negative Viewers. Some participants encountered significant abusive behaviour during streaming. Although many streamers experience this toxic environment [13, 14, 50], it may have particularly negative consequences for autistic streamers. For example, JaneTheMessage shared instances where such abusive behavior led to autistic meltdowns while streaming.

> *JaneTheMessage*: "It's just, there's a lot of really awful people. [...] I've had to interface with some of the most abusive people I have ever met. Shockingly abusive, and there's no real protections or professional standards. [...] So it feels like you can meet some truly frightening people, and you don't know if the threat is real or not, but it can be so intense and scary that, for me, it caused meltdowns as well. So I've had maybe two or three, no, more like three really, really, really bad meltdowns, and that's why I started getting further away from the political Twitch even though I know a lot about feminism. It just doesn't matter, it's not worth it."

While streamers felt that being autistic made their streams distinctive and unique, they also acknowledged that it could lead to conflict. For instance, streamers saw that not conforming to neurotypical viewer expectations could lead to negative interactions.

> *psoymilk*: "Like I wasn't really prepared on the pushback on how non-expressive I am. I would have never expected that like people watching me stream would expect me to smile more or expect me to very much convey my emotions on my face."

In another instance, RowanAster talked about using banning or blocking audience members in the chat. They found that beyond the typical use of these features to deal with abusive behavior they also sometimes removed people when there was difficulty in communication.

> *RowanAster*: "But a lot of times when we just encounter somebody that is going to cause a great deal of communication errors we will kind of remove them from our space. So this even as simple as somebody comes in and says something kind of nebulous, we ask them to explain, and they just don't or they keep responding in ways that are only creating more confusion or exemplified disinterest in being able to explain themselves or expound on their thoughts and the things they say. We'll remove them because we cannot afford to waste our time to communicate with somebody that's not going to try and communicate with us."

Our streamers also believed that in some cases that not fitting in to viewer expectations meant that they would lose viewers. For some, being themselves on stream meant it would be harder to gain new audience members and grow their stream.

> *NeroKoso*:" Cause whenever I talk, I have short answers and, like, it just comes out. I guess I may sound pissed off or bored or something when I talk. But that's part of the autism thingy. Like, people around you will view you that you are pissed off or you don't care about them or something like that. [...] And that's how I'm usually in my stream as well. Which, once again, maybe makes it hard for new followers to show up. Cause they will view me as a pissed off bald man."
>
> *Kennethiain*: "So, neurotypical people go into a stream. They have an expectations list of how a streamer is meant to behave, how a streamer is meant to look. Because of being autistic I can't always fit that."

4.5.2 (Livestreaming) Social Interaction is Draining. Social interaction in livestreaming takes effort and energy as it requires a high level of engagement with an audience. This has been described in prior work on the labor of streaming as requiring someone to be "socially active and emotionally responsive" [55]. This could be particularly challenging for autistic people who need to interact with a mainly non-autistic audience, as prior work has shown difficulties in communication can arise from mismatches in neurotype [17]. While this applies to in-person interaction with conversation partners, in some cases streaming can further exacerbate the issue. First, streaming tends to be a lengthy endeavour; all the streamers we talked to streamed for multiple hours at a time, and for multiple

days of the week. Second, being the focus of attention on the stream means that there is pressure to engage socially.

> *Ayymart*: "The game itself is less exhausting than being socially interactive. [...] I would just say the social activity can be more exhausting, but it's not like a bad exhausting. It's just, like, a lot sometimes."
>
> *NeroKoso*: "It's just, like, what to say. It's the social interaction part of that. People are saying stuff and then you have to say something and then you don't really know what to say and then you're thinking."
>
> *ThatWelshKaren*: "I usually get off the PC to relax as the whole process can be overwhelming. [...] It's mainly tired from doing so much talking to people."

It is clear that there are costs to being an autistic livestreamer; however for those we interviewed, the benefits to streaming outweighed the drawbacks. While these challenges may not be specifically *unique* to autistic individuals, they are exacerbated because of their preferences and abilities. Addressing these challenges for autistic streamers may require different approaches than for neurotypical streamers.

5 DISCUSSION

Our work aimed to describe the experience of autistic livestreamers: to understand this subculture, and as designers, to explore how it can be enhanced. More broadly though, livestreaming has an opportunity for autistic individuals to redress the harms from how autism has been represented in media. Livestreaming has been an opportunity, at least for our participants, to be their authentic selves, and to serve the autistic community. Below, we discuss these issues, as well as identify design and research opportunities for future designers and researchers.

5.1 Autistic Representation in Media

Our participants noted how vital it is to give autistic individuals a voice in the world, to share their perspectives on autism and their identities. Though none of our participants directly discussed media portrayals of autistic people, past work shows that many instances of autistic characters in media such as books and film follow stereotypical autistic tropes such as having savantism and being a Caucasian male [18, 21, 29]. Media representations of autism often wholly neglects to consider or include the rich diversity of autistic viewpoints. A notorious example is the "Ransom Notes" campaign created by the NYU Child Study Center that appeared in magazines an on billboards throughout New York City [31, 32]. The advertisements were intended as a public service campaign to raise awareness of childhood psychiatric disorders. One note stated: "We have your son. We will make sure he will not be able to care for himself or interact socially as long as he lives. This is only the beginning." and is signed by 'Autism.' The campaign ended after the Autistic Self Advocacy Network (ASAN)[4] and other disability rights organizations urged for its termination [5]. Their joint letter expressed concerns over the negative stereotyping and language used in the campaign and they asked to have autistic (and other disabled) voices be heard and included.

> "By choosing to portray people on the autism spectrum as well as those living with OCD, ADHD and other disabilities as kidnapped or possessed children, you have inadvertently reinforced many of the worst stereotypes that have prevented children and adults with disabilities from gaining inclusion, equality and full access to the services and supports they require." [6]

Due in part to advocacy from groups like ASAN, there has been more positive autistic representations in popular media, including portrayal of autistic adults in television series such as *The Good Doctor* [1] and *Extraordinary Attorney Woo* [3]. However, these shows and others still focus on savant characters, leaving the majority of non-savant autistic individuals underrepresented [27]. Additionally, while the actors in these series have been praised for their portrayal of autistic characters, they are not autistic themselves, resulting in a lack of genuine representation. This is starting to change with shows like *As We See It* [2], which features three diverse autistic young adults played by autistic actors showcasing the everyday experiences, challenges, and strengths of autistic individuals. But there is still much work to be done in terms of representation and visibility of autistic individuals in broader society.

Our work shows livestreaming as a platform where autistic people take back some control of this narrative. As JaneTheMessage describes, her presentation of herself allows her to challenge stereotypes about autism, and to create new narratives for autistic futures. Autistic livestreamers create presence, visibility of their identities, and the affordances of the communities they create through the platform allow them to embrace their identities within a supportive community.

5.2 Design Opportunities

We present several design opportunities for developing tools and interactions around the experience of livestreaming for autistic adults. We view these opportunities as starting points for future co-design conversations with autistic streamers.

Onboarding: The early stages of livestreaming for autistic adults can be difficult. Livestreaming can be a challenging experience for new streamers, particularly for autistic individuals who may struggle with social interaction. Starting a new livestream without prior experience can be a daunting task, and several autistic livestreamers we talked to described their difficulties engaging with their audience and streaming without an audience. Some reported that they lacked experience with in-person conversations, which could play a part in making it difficult to interact with viewers or freeze up on stream. Given challenges such as these, we suggest exploring the development of technology to help with the process of becoming a streamer. Prior work has looked at developing technologies, such as a chatbot, to assist inexperienced livestreamers in being talkative without a live audience [41]. However, that tool was developed without autistic users in mind; future research and development targeting autistic people should consider their preferences and perspectives.

Facilitating Communication: Livestreaming audiences communicate with each other and streamers primarily through a text and emote-based chat. For any streamer, it can be difficult to understand certain aspects of viewer messages, such as tone, emotion,

[4] https://autisticadvocacy.org/

and intent, and this challenge is heightened for autistic streamers. This is comparable to the challenges that autistic individuals might encounter with in-person communication. For instance, not recognizing a speaker's intended humor in an ironic statement as compared to neurotypical people [45]. Recognizing these challenges can lead us to develop technology to help autistic streamers better interpret and engage with their audience. Alternatively, we could also design for technologies to help audiences communicate more clearly that would also benefit autistic streamers.

5.3 Directions for Future Work

Because our work is the first to report on the world of autistic adult livestreamers, we focused on their overall experiences with the Twitch platform[5]. Future work should go beyond the sample of autistic streamers that we do here, understanding the experiences of different members of the community, people who are no longer active in the community, as well as how different platform affordances create or hinder opportunities for autistic individuals.

Autistic Audience Members: This study exclusively explored the perspectives of autistic livestreamers on Twitch, without considering autistic audience members. There is a larger population of autistic viewers on Twitch that do not stream themselves, who may or may not openly identify as autistic, but still benefit from the social interaction and community that streams offer. Future research could examine the benefits and challenges experienced by autistic audience members on livestreaming platforms.

Impacting Non-Autistic Streamers: While our work focuses on the experiences of autistic individuals we consider our findings and suggested design opportunities to be valuable to others addressing non-autistic streamers. For instance, there is some overlap in social interaction difficulties faced by people that are not autistic but have social anxiety, like not knowing what to say during a conversation. Researching and designing tools regarding this challenge could potentially help both autistic streamers and non-autistic streamers with social anxiety engage more comfortably with a livestream audience.

Other Social Platforms: We focused on the Twitch.tv platform in this work. There is an opportunity to explore other livestreaming platforms and how autistic users experience them. However, the findings and discussion we present may help inform autism-related research and development outside of livestreaming contexts such in video meetings like Zoom or in other social media like TikTok and Instagram.

Inexperienced or Lapsed Streamers: Our sample of interviewees that we talked to was biased due to the fact that they were all active streamers that had built communities and viewership, and had multiple years of experience. However, we could learn much more about the challenges and limitations of current streaming platforms by talking with autistic people that tried streaming and quit. The streamers we talked to have found ways to shape and understand their activity in a positive way—potentially because of their larger audiences. Two future lines of inquiry that would provide points of contrast would be to study inexperienced autistic streamers and lapsed autistic streamers. This could give us new insights on their initial draw to streaming, challenges that they encountered, and point to ways to adapt streaming platforms—or streaming as a medium—to better support autistic people.

[5]We emphasize that this account is not meant to homogenize the experiences of autistic livestreamers: they should only be considered as a singular group in the sense that they have individually found livestreaming and built a community for themselves; however, their opinions, experiences and preferences will also vary as individuals.

6 CONCLUSION

In this paper, we present a reflexive thematic analysis of 10 autistic streamers' perspectives on their motivations, challenges, benefits, and opportunities that they have found through their experiences livestreaming. Our participants found livestreaming offered them social opportunities, such as being part of a community and building relationships, which they might not have found through in-person social interactions. Moreover, their experiences livestreaming also created opportunities to meet and interact with people socially in the real world, beyond their livestreaming. Our streamers felt proud to be able to publicly represent autistic perspectives online, and enjoyed being free to express their authentic, autistic selves socially.

Our findings highlight many positive aspects of livestreaming for autistic streamers and how Twitch as a platform provide access to social spaces for autistic adults. Our interviews point to future work among autistic livestreaming audience members, as well as unique autistic experiences on other social media platforms. Rather than directly articulating specific technology implications, our work provides the groundwork for future co-design work with autistic streamers to develop ecosystems and technologies to directly incorporate their voices. We aim to pursue design opportunities from this work through co-design conversations with autistic streamers, ensuring their perspectives can inform the development of platforms tailored to their needs and goals in livestreaming.

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REFERENCES

[1] 2017. The Good Doctor. David Shore (Writer). Mike List (Director). 3AD, ABC Signature, EnterMedia Content, Pico Productions, Shore Z Productions, and Sony Pictures Television (Production). CTV Television Network (Distributor Canada).

[2] 2022. As We See It. David Boyd, Allison Liddi-Brown, Jaffar Mahmood, Jenee LaMarque, and Jesse Peretz (Directors). Jason Katims (Writer). Amazon Studios, True Jack Productions, Universal Television, and yes Studios (Production). Amazon Prime Video (Distributor Singapore). Amazon Studios (Distributor USA).

[3] 2022. Extraordinary Attorney Woo. Ji-Won Moon (Writer). Yu In-sik (Director). AStory, KT Studio Genie, and Nangman Crew (Production). Ena (Distributor South Korea). Netflix (Distributor World-wide).

[4] Susan Abel, Tanya Machin, and Charlotte Brownlow. 2019. Support, Socialise and Advocate: An Exploration of the Stated Purposes of Facebook Autism Groups. *Research in Autism Spectrum Disorders* 61 (May 2019), 10–21. https://doi.org/10.1016/j.rasd.2019.01.009

[5] Autistic Self Advocacy Network (ASAN). 2007. Victory! The End of the Ransom Notes Campaign. https://web.archive.org/web/20221004205335/https://autisticadvocacy.org/2007/12/victory-the-end-of-the-ransom-notes-campaign/

[6] Autistic Self Advocacy Network (ASAN). 2008. To the NYU Child Study Center and the supporters of the "Ransom Notes" advertising campaign. https://web.archive.org/web/20080709040600/http://www.autisticadvocacy.org/documents/nyu-response/JointLetter-12-11-07.pdf

[7] Monica L Bellon-Harn, Jianyuan Ni, and Vinaya Manchaiah. 2020. Twitter Usage About Autism Spectrum Disorder. *Autism* 24, 7 (Oct. 2020), 1805–1816. https://doi.org/10.1177/1362361320923173

[8] Monique Botha, Jacqueline Hanlon, and Gemma Louise Williams. 2021. Does Language Matter? Identity-First Versus Person-First Language Use in Autism Research: A Response to Vivanti. *Journal of Autism and Developmental Disorders* (Jan. 2021). https://doi.org/10.1007/s10803-020-04858-w

[9] Virginia Braun and Victoria Clarke. 2006. Using Thematic Analysis in Psychology. *Qualitative Research in Psychology* 3, 2 (Jan. 2006), 77–101. https://doi.org/10.1191/1478088706qp063oa

[10] Virginia Braun and Victoria Clarke. 2019. Reflecting on Reflexive Thematic Analysis. *Qualitative Research in Sport, Exercise and Health* 11, 4 (Aug. 2019), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

[11] Moira Burke, Robert Kraut, and Diane Williams. 2010. Social use of Computer-Mediated Communication by Adults on the Autism Spectrum. In *Proceedings of the 2010 ACM Conference on Computer Supported Cooperative Work (CSCW '10)*. ACM, New York, NY, USA, 425–434. https://doi.org/10.1145/1718918.1718991

[12] Eilidh Cage, Jessica Di Monaco, and Victoria Newell. 2018. Experiences of Autism Acceptance and Mental Health in Autistic Adults. *Journal of Autism and Developmental Disorders* 48, 2 (Feb. 2018), 473–484. https://doi.org/10.1007/s10803-017-3342-7

[13] Jie Cai and Donghee Yvette Wohn. 2019. What are Effective Strategies of Handling Harassment on Twitch? Users' Perspectives. In *Companion Publication of the 2019 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '19)*. ACM, New York, NY, USA, 166–170. https://doi.org/10.1145/3311957.3359478

[14] Mia Consalvo. 2018. Kaceytron and Transgressive Play on Twitch.tv. In *Transgression in Games and Play*. MIT Press Cambridge, 83–98.

[15] Kate Cooper, Laura G. E. Smith, and Ailsa Russell. 2017. Social identity, self-esteem, and mental health in autism. *European Journal of Social Psychology* 47, 7 (2017), 844–854. https://doi.org/10.1002/ejsp.2297

[16] Catherine J Crompton, Sonny Hallett, Danielle Ropar, Emma Flynn, and Sue Fletcher-Watson. 2020. 'I never realised everybody felt as happy as I do when I am around autistic people': A Thematic Analysis of Autistic Adults' Relationships with Autistic and Neurotypical Friends and Family. *Autism* 24, 6 (Aug. 2020), 1438–1448. https://doi.org/10.1177/1362361320908976

[17] Catherine J Crompton, Danielle Ropar, Claire VM Evans-Williams, Emma G Flynn, and Sue Fletcher-Watson. 2020. Autistic Peer-to-Peer Information Transfer is Highly Effective. *Autism* 24, 7 (Oct. 2020), 1704–1712. https://doi.org/10.1177/1362361320919286

[18] Michelle Dean and Anders Nordahl-Hansen. 2022. A Review of Research Studying Film and Television Representations of ASD. *Review Journal of Autism and Developmental Disorders* 9, 4 (Dec. 2022), 470–479. https://doi.org/10.1007/s40489-021-00273-8

[19] Paul Dourish. 2006. Implications for design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '06)*. ACM, New York, NY, USA, 541–550. https://doi.org/10.1145/1124772.1124855

[20] Mette Elmose. 2020. Understanding Loneliness and Social Relationships in Autism: The Reflections of Autistic Adults. *Nordic Psychology* 72, 1 (Jan. 2020), 3–22. https://doi.org/10.1080/19012276.2019.1625068

[21] Rosa Fontes and Margarita Pino-Juste. 2021. Portrayals of Autism and Social Awareness: A Scoping Review. *Advances in Autism* 8, 3 (Jan. 2021), 196–206. https://doi.org/10.1108/AIA-02-2021-0014

[22] Kyle M. Frost, Kathryn M. Bailey, and Brooke R. Ingersoll. 2019. "I Just Want Them to See Me As…Me": Identity, Community, and Disclosure Practices Among College Students on the Autism Spectrum. *Autism in Adulthood* 1, 4 (Dec. 2019), 268–275. https://doi.org/10.1089/aut.2018.0057

[23] Mohammad Ghaziuddin and Leonore Gerstein. 1996. Pedantic Speaking Style Differentiates Asperger Syndrome from High-Functioning Autism. *Journal of Autism and Developmental Disorders* 26, 6 (Dec 1996), 585–595. https://doi.org/10.1007/BF02172348

[24] Kristen Gillespie-Lynch, Steven K. Kapp, Christina Shane-Simpson, David Shane Smith, and Ted Hutman. 2014. Intersections Between the Autism Spectrum and the Internet: Perceived Benefits and Preferred Functions of Computer-Mediated Communication. *Intellectual and Developmental Disabilities* 52, 6 (Dec. 2014), 456–469. https://doi.org/10.1352/1934-9556-52.6.456

[25] Kishonna Gray-Denson. 2016. "They're just too urban": Black Gamers Streaming on Twitch. In *Digital Sociologies*. https://doi.org/10.2307/j.ctt1t89cfr.28

[26] William A. Hamilton, Oliver Garretson, and Andruid Kerne. 2014. Streaming on Twitch: Fostering Participatory Communities of Play Within Live Mixed Media. In *Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI '14)*. ACM, New York, NY, USA, 1315–1324. https://doi.org/10.1145/2556288.2557048

[27] Patricia Howlin, Susan Goode, Jane Hutton, and Michael Rutter. 2009. Savant Skills in Autism: Psychometric Approaches and Parental Reports. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364, 1522 (May 2009), 1359–1367. https://doi.org/10.1098/rstb.2008.0328

[28] Laura Hull, K. V. Petrides, Carrie Allison, Paula Smith, Simon Baron-Cohen, Meng-Chuan Lai, and William Mandy. 2017. "Putting on My Best Normal": Social Camouflaging in Adults with Autism Spectrum Conditions. *Journal of Autism and Developmental Disorders* 47, 8 (Aug. 2017), 2519–2534. https://doi.org/10.1007/s10803-017-3166-5

[29] Sandra C Jones, Chloe S Gordon, and Simone Mizzi. 2023. Representation of Autism in Fictional Media: A Systematic Review of Media Content and its Impact on Viewer Knowledge and Understanding of Autism. *Autism* (Feb. 2023), 13623613231155770. https://doi.org/10.1177/13623613231155770

[30] Steven K Kapp, Robyn Steward, Laura Crane, Daisy Elliott, Chris Elphick, Elizabeth Pellicano, and Ginny Russell. 2019. 'People should be allowed to do what they like': Autistic Adults' Views and Experiences of Stimming. *Autism* 23, 7 (Oct. 2019), 1782–1792. https://doi.org/10.1177/1362361319829628

[31] Joanne Kaufman. 2007. Campaign on Childhood Mental Illness Succeeds at Being Provocative. *The New York Times* (Dec. 2007). https://www.nytimes.com/2007/12/14/business/media/14adco.html

[32] Joanne Kaufman. 2007. Ransom-Note Ads About Children's Health Are Canceled. *The New York Times* (Dec. 2007). https://www.nytimes.com/2007/12/20/business/media/20child.html

[33] Ami Klin and Fred R Volkmar. 2003. Asperger syndrome: Diagnosis and External Validity. *Child and Adolescent Psychiatric Clinics of North America* 12, 1 (Jan. 2003), 1–13. https://doi.org/10.1016/S1056-4993(02)00052-4

[34] Laura Foran Lewis and Kailey Stevens. 2023. The Lived Experience of Meltdowns for Autistic Adults. *Autism* (Jan. 2023). https://doi.org/10.1177/13623613221145783

[35] Zhicong Lu. 2019. Live streaming in China for Sharing Knowledge and Promoting Intangible Cultural Heritage. *Interactions* 27, 1 (Dec. 2019), 58–63. https://doi.org/10.1145/3373145

[36] Zhicong Lu, Michelle Annett, Mingming Fan, and Daniel Wigdor. 2019. "I Feel It is My Responsibility to Stream": Streaming and Engaging with Intangible Cultural Heritage Through Livestreaming. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*. ACM, New York, NY, USA, 229:1–229:14. https://doi.org/10.1145/3290605.3300459

[37] Kirsti Malterud, Volkert Dirk Siersma, and Ann Dorrit Guassora. 2016. Sample Size in Qualitative Interview Studies: Guided by Information Power. *Qualitative Health Research* 26 (2016), 1753–1760. https://doi.org/10.1177/1049732315617444

[38] David Mason, Helen McConachie, Deborah Garland, Alex Petrou, Jacqui Rodgers, and Jeremy R. Parr. 2018. Predictors of quality of life for autistic adults. *Autism Research: Official Journal of the International Society for Autism Research* 11, 8 (Aug. 2018), 1138–1147. https://doi.org/10.1002/aur.1965

[39] Ethan May. 2021. Streamlabs & Stream Hatchet Q3 Live Streaming Industry Report. https://blog.streamlabs.com/streamlabs-stream-hatchet-q3-live-streaming-industry-report-a49adba105ba

[40] Micah O. Mazurek. 2013. Social Media Use Among Adults with Autism Spectrum Disorders. *Computers in Human Behavior* 29, 4 (July 2013), 1709–1714. https://doi.org/10.1016/j.chb.2013.02.004

[41] Terrance Mok, Colin Matthew Au Yueng, Anthony Tang, and Lora Oehlberg. 2020. Talk Like Somebody is Watching: Understanding and Supporting Novice Live Streamers. In *ACM International Conference on Interactive Media Experiences*. 154–159. https://doi.org/10.1145/3391614.3399392

[42] Terrance Mok, Anthony Tang, Adam McCrimmon, and Lora Oehlberg. 2022. Social Access and Representation for Autistic Adult Livestreamers. In *Proceedings of the ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '22)*. ACM, New York, NY, USA, 1–4. https://doi.org/10.1145/3517428.3550400

[43] Eve Müller, Adriana Schuler, and Gregory B. Yates. 2008. Social Challenges and Supports from the Perspective of Individuals with Asperger Syndrome and Other Autism Spectrum Disabilities. *Autism* 12, 2 (March 2008), 173–190. https://doi.org/10.1177/1362361307086664

[44] Rhea Paul, Stephanie Miles Orlovski, Hillary Chuba Marcinko, and Fred Volkmar. 2009. Conversational Behaviors in Youth with High-functioning ASD and Asperger Syndrome. *Journal of Autism and Developmental Disorders* 39, 1 (Jan. 2009), 115–125. https://doi.org/10.1007/s10803-008-0607-1

[45] Penny M. Pexman, Kristin R. Rostad, Carly A. McMorris, Emma A. Climie, Jacqueline Stowkowy, and Melanie R. Glenwright. 2011. Processing of Ironic Language in Children with High-Functioning Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders* 41, 8 (Aug. 2011), 1097–1112. https://doi.org/10.1007/s10803-010-1131-7

[46] Kathryn E. Ringland. 2019. "Autsome": Fostering an Autistic Identity in an Online Minecraft Community for Youth with Autism. In *Information in Contemporary Society (Lecture Notes in Computer Science)*, Natalie Greene Taylor, Caitlin Christian-Lamb, Michelle H. Martin, and Bonnie Nardi (Eds.). Springer International Publishing, Cham, 132–143. https://doi.org/10.1007/978-3-030-15742-5_12

[47] Kathryn E. Ringland, LouAnne Boyd, Heather Faucett, Amanda L.L. Cullen, and Gillian R. Hayes. 2017. Making in Minecraft: A Means of Self-Expression for Youth with Autism. In *Proceedings of the 2017 Conference on Interaction Design and Children (IDC '17)*. ACM, New York, NY, USA, 340–345. https://doi.org/10.1145/3078072.3079749

[48] Kathryn E. Ringland, Christine T. Wolf, Heather Faucett, Lynn Dombrowski, and Gillian R. Hayes. 2016. "Will I always be not social?": Re-Conceptualizing Sociality in the Context of a Minecraft Community for Autism. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1256–1269. https://doi.org/10.1145/2858036.2858038

[49] Joseph Seering, Robert Kraut, and Laura Dabbish. 2017. Shaping Pro and Anti-Social Behavior on Twitch Through Moderation and Example-Setting. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17)*. ACM, New York, NY, USA, 111–125. https://doi.org/10.1145/2998181.2998277

[50] Kurt Thomas, Patrick Gage Kelley, Sunny Consolvo, Patrawat Samermit, and Elie Bursztein. 2022. "It's common and a part of being a content creator": Understanding How Creators Experience and Cope with Hate and Harassment Online. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. ACM, New York, NY, USA, 1–15. https://doi.org/10.1145/3491102.3501879

[51] Dominic A. Trevisan, Nicole Roberts, Cathy Lin, and Elina Birmingham. 2017. How do Adults and Teens with Self-declared Autism Spectrum Disorder Experience Eye Contact? A Qualitative Analysis of First-hand Accounts. *PLOS ONE* 12, 11 (Nov. 2017). https://doi.org/10.1371/journal.pone.0188446

[52] Kana Umagami, Anna Remington, Brynmor Lloyd-Evans, Jade Davies, and Laura Crane. 2022. Loneliness in Autistic Adults: A Systematic Review. *Autism* 26, 8 (Nov. 2022), 2117–2135. https://doi.org/10.1177/13623613221077721

[53] Christine van der Aa, Monique M. H. Pollmann, Aske Plaat, and Rutger Jan van der Gaag. 2016. Computer-mediated Communication in Adults with High-Functioning Autism Spectrum Disorders and Controls. *Research in Autism Spectrum Disorders* 23 (March 2016), 15–27. https://doi.org/10.1016/j.rasd.2015.11.007

[54] Donghee Yvette Wohn and Guo Freeman. 2020. Audience Management Practices of Live Streamers on Twitch. In *ACM International Conference on Interactive Media Experiences (IMX '20)*. ACM, New York, NY, USA, 106–116. https://doi.org/10.1145/3391614.3393653

[55] Jamie Woodcock and Mark R. Johnson. 2019. The Affective Labor and Performance of Live Streaming on Twitch.tv. *Television & New Media* (May 2019). https://doi.org/10.1177/1527476419851077

[56] Annuska Zolyomi, Andrew Begel, Jennifer Frances Waldern, John Tang, Michael Barnett, Edward Cutrell, Daniel McDuff, Sean Andrist, and Meredith Ringel Morris. 2019. Managing Stress: The Needs of Autistic Adults in Video Calling. *Proc. ACM Hum.-Comput. Interact.* 3, CSCW, Article 134 (Nov 2019), 29 pages. https://doi.org/10.1145/3359236