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**Exploring Viewers' Experiences of Parasocial Interactions with Videogame Streamers
on Twitch**

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All data and materials are available at <https://osf.io/jwxdz/>.

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Abstract

Research on parasocial interaction (PSI) has a long tradition in non-interactive environments such as watching TV or listening to radio speakers. In the last years, researchers have started to apply PSI on videogame streaming environments, where the audience can interact with the observed media persona and get immediate feedback on their messages and requests. In a 3×2 online experiment ($N = 251$), we manipulated how a streamer addressed participants (individual vs. collective vs. no addressing) and whether he paid attention to and answered messages in the chat (attention vs. no attention to the chat). Findings show that the more individually participants were addressed and whether the streamer reacted to messages in the chat affected experiences of PSI. Further, alongside their overall enjoyment, PSI predicted viewers' commitment to social norms. We discuss these findings regarding their implications for the conceptualization of PSI in light of interactive novel technologies.

Keywords: *parasocial interaction, videogame streaming, Twitch, commitment to social norms*

Exploring viewers' experiences of parasocial interactions with videogame streamers on Twitch

Videogame streaming is getting more popular every day. In an average week, 2,425,638 users are watching channels of 92,819 concurrent streamers using the videogame streaming platform *Twitch*.¹ Besides relaxing² and learning strategies,³ recent research found that parasocial interaction (PSI) with streamers and communicating with other viewers are key motivations to use Twitch⁴. Although the number of Twitch users and the industry behind it are growing, experimental research on the causes and effects of PSI on Twitch cannot keep pace. However, such research is much needed as it scrutinizes how media personae can directly foster parasocial experiences with their audience, how the audience can enjoy such experiences, and also how such experiences may contribute to relationships, in which streamers and viewers treat each other with respect, following a sort of etiquette that prevents uncivil behaviors like trolling in the chat.

Following research on the interplay of parasocial experiences, enjoyment, and commitment to social norms (CSN) for TV viewing by Hartmann and Goldhoorn,⁵ we experimentally manipulated how streamers addressed viewers and whether they interacted with users via the chat. We examined the effects on PSI and how PSI and enjoyment were associated with CSN.

Parasocial Interaction with Videogame Streamers

A newscaster talking to the audience, a show master integrating the studio audience, or a radio moderator anticipating the listeners' reactions on news; media personae address their audience and the audience, in turn, feels addressed. As media users seem to be involved in this "simulacrum of conversational give and take" with media personae, Horton and Wohl⁶ described that people engage with media personae in an imagined interactive way, so-called *parasocial*

interaction. Since the 1950s, research has discovered many prerequisites and effects of PSIs and of relationships that people engage in with media personae after recurring PSIs (parasocial relationships, PSR).^{7,8} PSRs are positively related to media enjoyment.^{9,10} Regarding new media, media characters engage in PSIs not only in mass communication (e.g., newscasters) but also in interpersonal communication (e.g., social media, videogame avatars) and create a sense of reciprocity via interaction if viewers perceive them as authentic¹¹. As streamers communicate with a mass audience but have the opportunity to address particular messages of viewers as interpersonal communication, this applies to Twitch as well. Indeed, first research showed that in a social media context, PSI increased when media personae appeared authentic and approachable¹² or when media personae shared one's content.¹³ For the streaming industry, only few studies have shown that viewing intention was related to the quality of relationships between viewers and streamers and to entertainment experiences^{14,15}.

Recently, researchers investigated the relationship between PSRs with videogame streamers and media enjoyment⁴. Discussing the term *parasocial* concerning its application for Twitch, they noted that streamers address users directly, thereby making the streamer-viewer communication a seemingly *real* interaction. Nevertheless, they added that such interaction cannot be equated with real-life relationships and, thus, the term parasocial may still hold because the interactions are rather few and isolated events, mostly initiated by the viewers. This conclusion mirrors Hartmann's framework of PSIs for new media as described above¹¹. Building upon this argument, we assume that videogame streamers also interact with their viewership in PSIs: Although streamers do not know every single viewer, they anticipate how people will react to certain utterances, strategic decisions in-game, and how they are integrated into the streamers' decision-making. More than the news anchorman, however, streamers can directly

address specific viewers, for example, after a personalized subscription or after a message posted in the chat. We assume that the way streamers interact with viewers impacts PSI experiences.

In their seminal study, Hartmann and Goldhoorn⁵ manipulated how TV performers addressed viewers on a bodily and verbal level. Both addressing levels had an impact on PSI with viewers. As viewers can interact with streamers in real-time, videogame streaming can be characterized as more dynamic and interactive than watching TV. Viewers of streamed videogames can subscribe, send messages via the user interface, and ask questions in the chat. The streamer can react to all of these actions and address users either individually (e.g., single subscribers) or collectively (all the viewers). We assume that how streamers interact with their viewers impacts the users' PSI experiences. In line with previous findings,⁵ we predict that the more individually streamers address viewers, the more viewers experience PSI with the streamer (H1).

Moreover, PSI is stimulated by the experience that media personae keep up the conversation and respect the viewers' thoughts and feelings¹¹. Following research on social presence defined as "the subjective experience of being present with a 'real' person and having access to his or her thoughts and emotions"¹⁶ (p. 1), interactivity can increase feelings of social presence¹⁷ through enhancing the perception that one is talking with an intelligent being that directly answers concerns or questions. Such perceptions should also foster experiencing PSIs with streamers on Twitch. Thus, we assume that viewers experience more PSI if streamers pay attention to the chat than if streamers ignore the chat (H2).

Commitment to Particular Streams

Given the huge number of simultaneously running streams, streamers have to attract viewers and make them keep watching their channel. Indeed, some streamers may keep their

audience just because of their popularity or their in-game achievements.¹⁸ Nonetheless, streamers may also aim at developing personal relationships with their viewers, for example, through recurring PSIs. Once such a relationship is established, social norms may hinder viewers from leaving the stream(er) and also reduce the likelihood of viewers expressing themselves in uncivil manners (trolling, flaming, etc.)¹⁹. Indeed, besides entertainment, sociability is driving loyalty to streamers¹³. Building upon research on expectations about social norms and anticipated reactions of others when violating these norms,^{20,21} research investigated the commitment to social norms (CSN) as influenced by PSIs and enjoyment⁵. Arguing that even implied social interaction (like in PSIs) may increase the embarrassment and feelings of impoliteness that comes with violating these norms, PSI with TV personae and enjoyment predicted CSN.⁵ Therefore, we propose that the more viewers experience PSI with the streamer (H3a) and the more viewers experience enjoyment while viewing (H3b), the more they feel committed to social norms.

Method

In a 3×2 online experiment, we manipulated how a streamer addressed participants (individual vs. collective vs. no addressing) and whether he paid attention to and answered messages in the chat (attention vs. no attention to the chat). The study was preregistered (<https://aspredicted.org/pt8kj.pdf>) and data and material (including a detailed questionnaire) are available online (<https://osf.io/jwxdz/>).

Participants

We conducted an apriori power analysis ($\alpha = .05$; Power = .95) to calculate the required sample size, based on known effect size ($\eta_p^2 = .09$)⁵, resulting in a sample of $N_{\text{required}} = 160$ participants (because of a typo concerning the numerator degrees of freedom, our analysis resulted in a larger sample than needed. Thus, we can detect even smaller effects). To account

for sample mortality and failed attention checks, we aimed at a total sample of 300 participants. We collected a convenience sample of 298 German participants via social media postings. We incentivized participation with 20 cents donated to charity organizations for every finished interview. We excluded participants who finished their interview in less than four minutes (each stimulus took 170 seconds) and those who failed the attention checks, leading to a final sample of $N = 251$ participants (57% female; age breakdown: 14–17: 4%; 18–24: 44.2%; 25–34: 49.4%; 35 and older: 2.4%). The sample was highly educated as 90% had at least one high school diploma. Moreover, 57% answered that they know about Twitch and 25% answered that they at least occasionally watch streams.

Procedure

After providing informed consent, we randomly assigned participants to one of six conditions. We instructed participants to imagine a situation in which they were about to subscribe to a Twitch.tv channel. Participants who indicated that they were not familiar with Twitch were given short information about the platform and its functions. Importantly, we told participants the username—the gender-neutral name “Awym”—they will have (parallelized between conditions) and subsequently showed participants the stimulus material. After watching the clip, we conducted manipulation checks and questionnaires about PSI, enjoyment, and CSN. Participants finished the questionnaire by providing sociodemographic data, frequency of videogame streaming use, and a suspicion check. Finally, participants were debriefed and thanked.

Stimuli

We recorded video stimuli in cooperation with a professional Twitch streamer to ensure authenticity and reduce differences between streams. All stimuli were about 170 seconds long

and showed the same episode of the streamer playing *Dark Souls: Prepare to Die™* edition. In-game events, the sequence of chat messages and the streamer's setting (lighting and audio quality) were the same between conditions.

Paying attention to the chat. We manipulated attention to the chat via verbal and non-verbal cues. In chat-conditions, the streamer repeatedly turned his head towards his second screen (away from the camera), read (loudly), and answered viewer messages. In the no-chat condition, he always looked at the same screen and did not read or answer messages. He was talking about the same content for the same amount of time in chat and no-chat conditions.

(Personally) addressing viewers. After about one minute of watching the stream, participants were shown the reward message notifying them about their subscription to the channel. After this notification, the streamer in the individual-addressing condition thanked the participant for subscribing. He addressed the participants via their assigned username and thanked them for watching. Whereas, in the collective-addressing condition, he thanked all viewers for watching. In the no-addressing condition, the streamer did not react to the subscription notification at all.

Pilot testing. Before using the stimuli in the main study, we pilot-tested the material (for details, see Appendix A in the Supplemental Material).

Measures

We measured all constructs on a 5-point scale ranging from 1 (*absolutely disagree*) to 5 (*absolutely agree*). All items were translated to German and then back-translated to English to avoid translation issues.

Parasocial interaction. We measured PSI with the EPSI scale⁵ (6 items; e.g. “While watching the clip, I had the feeling that the streamer knew I was there”, $M = 3.03$, $SD = 1.00$, Cronbach’s $\alpha = .91$).

Enjoyment. To measure enjoyment, we adapted five items²² (e.g., “Watching the stream was entertaining;” $M = 2.29$, $SD = 1.27$, Cronbach’s $\alpha = .94$).

Commitment to social norms. We assessed CSN with three items.⁵ Items ask how embarrassing participants would feel to prematurely leave the stream or insult the streamer. We added another three items asking for social norm violation in the chat (e.g., “It would have felt wrong to spam in the chat;” $M = 3.33$, $SD = 0.89$, Cronbach’s $\alpha = .79$).

Manipulation checks. To test for successful manipulations, we asked whether participants felt addressed by the streamer (4 items, e.g., “I felt personally addressed by the streamer;” $M = 2.90$, $SD = 1.24$, $\alpha = .87$) and whether the streamer paid attention to the chat (4 items, e.g., “The streamer paid attention to the chat;” $M = 3.36$, $SD = 1.36$, $\alpha = .96$). To test for participants’ attention, we openly asked them for the username that we had assigned them.

Results

Manipulation check

To evaluate whether our manipulations were successful, we conducted a MANOVA across all conditions. Dependent variables were perceived chat attention of the streamer and perceived addressing (for descriptive statistics, see Table 1). This resulted in significant main effects of chat attention, Pillai’s $V = .59$, $F(2, 244) = 175.68$, $p < .001$, $\eta_p^2 = .59$, and addressing style, Pillai’s $V = .56$, $F(4, 490) = 47.77$, $p < .001$, $\eta_p^2 = .28$. The interaction was not significant, Pillai’s $V = .02$, $F(4, 490) = 47.77$, $p = .320$, $\eta_p^2 = .01$. As expected, compared to the no-chat conditions, participants in the chat conditions agreed more that the streamer paid attention to the

chat, $F(1, 245) = 350.97, p < .001, \eta_p^2 = .59$. The addressing style condition also significantly affected perceived addressing, $F(2, 245) = 150.65, p < .001, \eta_p^2 = .55$. Sidak post-hoc comparisons showed that individually addressed participants reported significantly more addressing than collectively addressed participants, $\Delta M = 1.46, SE = .13, p < .001$. Moreover, collectively addressed participants and non-addressed participants significantly differed, $\Delta M = 0.73, SE = .13, p < .001$. The manipulation was successful.

Parasocial interaction

To analyze the influence of both manipulations (H1 and H2), we conducted a two-factorial (chat $\times$ addressing style) ANOVA, which showed a significant main effect of paying attention to the chat on experienced PSI, $F(1, 245) = 47.23, p < .001, \eta_p^2 = .16$. When the streamer paid attention to the chat, participants experienced more PSI than when he did not, $\Delta M = 0.70, SE = .10, p < .001$. The main effect of addressing style on experienced PSI was significant, $F(2, 245) = 47.93, p < .001, \eta_p^2 = .28$. Sidak post-hoc tests showed that individually addressed participants experienced most PSI ($M = 3.65, SD = 0.81$), followed by the collectively ($M = 2.87, SD = 0.85$), and the non-addressed condition ($M = 2.45, SD = .96$). All differences were significant (all $ps < .005$, see Figure 1). The interaction between chat attention and addressing style was not significant, $F(2, 245) = 1.14, p = .323, \eta_p^2 = .01$. Thus, H1 and H2 were supported by our data.

Commitment to social norms

H3a and H3b predicted that the level of PSI and enjoyment predicted CSN. In a regression model, we entered enjoyment and PSI as predictors for CSN, controlling for gender. Enjoyment ($b = .14$) and PSI ($b = .33$) were significant predictors for CSN, thereby supporting H3a and H3b (for details, see Table 2). The model significantly accounted for 26% of the

variance. Thus, PSI and enjoyment contribute to the CSN when watching a videogame stream on Twitch.

Main effects on the commitment to social norms and enjoyment

To test for all pre-registered assumptions, we also conducted analyses of the main and interaction effects on enjoyment and CSN. For details, see Appendix B in the Supplemental Material.

Discussion

This study replicated core assumptions about PSI and extended their applicability to emerging videogame streaming technologies. Moreover, this preregistered study is one of the first to manipulate streamer–viewer interactions to experimentally test for their impact on viewer experiences on Twitch. We found that directly addressing viewers and paying attention to their feedback via the chat enhanced feelings of PSI and that PSI alongside enjoyment contributed to viewers' CSN. These findings come with research implications for videogame streaming as well as for PSI and PSR.

First, our findings show that addressing style directly affected PSI. Viewers who were addressed individually showed higher PSI ratings than viewers who were addressed collectively or not addressed at all. This replicates and extends findings from previous research⁵. Moreover, in initiating PSI and PSR, a streaming platform may outperform TV or other asynchronous media because streamers can directly respond to and address particular users. Future research should systematically control the technology used to see whether streaming platforms lead to higher experiences of PSI.

Our findings also align with theoretical¹¹ and empirical²³ research that applied PSI to new media, indicating that interpersonal communication with media personae can lead to higher PSI.

In our study, those participants who were directly addressed scored higher on PSI. However, original PSI concepts⁶ did not account for interpersonal communication and possible reciprocal reactions of media personae as found on Twitch. Thus, future research could further expand the boundaries of PSIs in settings that merge mass and interpersonal communication. Specifically concerning Twitch, one interesting question could be whether streamers earn authenticity through their personality, their message (e.g., games or strategies), or their interaction with others (e.g., the audience). Such research might be guided, for example, by Lee's framework for computer-mediated communication in the interpersonal context.²⁴

Second, our findings highlight the value for streamers to individually address their audience and answer chat messages. We showed that both of these elements directly influenced PSI positively and that, even more important, PSI alongside overall enjoyment affected CSN. This is in line with pioneer work on the association between PSI and norm commitment⁵ and underscores the social value of communicating as directly as possible. In other words, the more streamers interact with viewers, the less likely viewers switch streams or engage in trolling or flaming.¹⁹ Further studies should also examine how PSIs may influence viewers' attitudes (e.g., by increasing trust and commitment to the streamer). As interactivity increased authenticity and thus trust towards influencers and brands²⁵, PSIs might encourage the audience to subscribe to channels and donate money to those streamers to whom they are most committed. Another avenue might investigate how parasocial experiences on Twitch affect viewers' belongingness and well-being.²⁶ Such research can apply these findings to other fields, for instance, to digitized communication with medical doctors and therapists in cybertherapeutic settings.

Still, our experiment comes with some limitations. First, whereas our sample was balanced regarding gender distribution, it does not represent the actual Twitch audience because most users

are male (81.5%).²⁷ Second, we used 170-second videos of a single streamer, thereby controlling confounds such as the game played, content on-screen, and settings of the streamer. Although this increased internal validity and followed the call for controlled designs in PSI research,²⁸ in reality, viewers can choose among hundreds of games played by various streamers (of all genders) and watch as long as they like. To increase ecological validity and generalizability, future research can allow participants to customize their setting(s) and deliberately choosing what they want.

In summary, our work replicated and extended conceptualizations of PSI in the technologically novel environment of videogame streaming. We showed that user interfaces that allow to seemingly directly interacting with the audience and directly addressing the audience during media exposure could foster PSI and, thus, indirectly lead individuals to enjoy what they watch and commit to social norms. We call for a re-conceptualization of PSI over and above the *only-imagined* conversational give and take. Moreover, we emphasize the need for further research on the technology-specific characteristics that allow to interact with and relate to media personae.

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