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The role of social presence in live and recorded concert viewing: Effects on enjoyment and emotional well-being

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ABSTRACT

In recent years livestream events have become increasingly popular, in part to cope with social isolation experienced during the COVID-19 pandemic. The potential of livestreams to mitigate the negative effects of isolation lacks empirical evidence. To address this gap, we compared the effect of watching a concert on livestream with watching a recording of the same event on viewer's social presence, enjoyment, social connectedness, and loneliness. Livestream viewing was expected to result in higher levels of enjoyment and social connectedness, and lower levels of loneliness compared to viewing the recording. The effect of concert viewing mode on viewers' experience was expected to be mediated by social presence. In line with expectations, participants reported higher social presence and enjoyment in the livestream condition compared to the recorded condition, although, participants reported similar levels of social connectedness and loneliness in both conditions. Moreover, we did not find support for social presence as a mediator. In sum, while livestreamed events can enhance feelings of social presence and be more enjoyable, further research is needed to understand whether and how this can be utilized to mitigate loneliness and lack of social connectedness.

1. Introduction

Live music has a long and universal tradition as a social phenomenon that entertains and connects people (Freeman, 2000; Nettl & Russell, 1998). People attend concerts "to be a part of something unique and special" and to "share this experience with like-minded others" (Brown & Knox, 2017, p. 233). In March 2020, however, the COVID-19 pandemic, and subsequent governmental restrictions brought the entire live entertainment industry to a halt (Cooper, 2020). According to the European non-governmental network Live DMA which encompasses 2.600 live venues, there was a 70% decline in music events and artist performances, and a 76% decline in audience in 2020 compared to 2019 (Dee, 2020). Due to the lack of live events, livestreamed concerts emerged rapidly, and it is argued that with their increased popularity they can cause a shift in music consumption culture and become an integral part of the music industry (Lee et al., 2020; Yahr, 2021). This trend was apparent in 2022 and 2023, during which most restrictions were lifted but several music festivals opted to livestream at least some of their concerts (e.g., Aspen Music Festival, Coachella, Glastonbury, Rock am Ring, and Tomorrowland).

Cancellation of live music events was only one of the measures aimed at controlling the spread of the virus; many other social events were cancelled, people were asked to spend time in isolation and to work from home, and even full lockdowns were introduced in several countries. The World Health Organization predicted that European citizens would feel depressed and lonely because of these actions that encompassed social distancing ("Mental health and COVID-19", 2021). These predictions were confirmed by several cross-sectional and longitudinal studies conducted in Europe (Debowska et al., 2022; Varga et al., 2021). Especially, younger people (e.g., between 16 and 30 years of age) and women reported high levels of depression and anxiety during the pandemic compared to adults older than 30 and men (e.g., Debowska et al., 2022; Varga et al., 2021).

Research on entertainment experiences has shown that individuals turn to media to optimize their moods (Knobloch-Westerwick, 2006; Zillmann, 1988). Specifically, listening to music has been repeatedly shown to help maintaining a positive mood (Baltazar & Saarikallio, 2016; Lonsdale & North, 2011). Young adults, especially women and people who on average feel more anxious in general, are known to turn to music as a coping strategy for alleviating stress (ter Bogt et al., 2016).

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Studies conducted during the pandemic showed that music is an effective way to reach wellbeing goals such as enjoyment, venting negative emotions and self-connection (Granot et al., 2021; Martínez-Castilla, Gutiérrez-Blasco, Spitz, & Granot, 2021). While this consoling effect can relate to enjoyment of musical factors such as the melody or the lyrics, it can also be due to experiencing feelings of togetherness either with the artists or other listeners (ter Bogt et al., 2016; Granot et al., 2021). As such experiencing music in the presence of the artist and/or other people might be especially beneficial. While it is not always possible to attend concerts physically, there are more and more possibilities to follow them online via livestreams. However, so far, there is limited knowledge as to what extent concert livestream experiences can match live concert experiences in terms of both the enjoyment they provide as well as their ability to help alleviate negative feelings such as loneliness.

While the prevalence of livestreaming has increased in the recent years, due to adaption of social media platforms and dedicated livestreaming tools like Twitch, YouTube Live, Facebook Live, Instagram Live, TikTok, Zoom and, Discord, research focusing on these mediated live experiences - specifically music livestreams-is still rather new (Hilvert-Bruce et al., 2018; Onderdijk et al., 2021). At the same time, livestreaming shares several characteristics with Social TV which has a longer research tradition. Social TV refers to watching a mediated event such as a TV show while communicating about it with other viewers for example on social media (Krämer et al., 2015). A concert livestream shares similar affordances to social TV viewing, as they both involve *liveness* – a real-time broadcasted event shared by all audience members, as well as *immediacy*— a possibility to directly communicate with other viewers. Most livestreaming platforms afford social interactions, making it possible for people to engage in a *social* concert livestream experience even though other viewers are not physically present. Thus, in the context of both social TV and livestreams, the viewer's entertainment experience is a live but mediated event which is shared with others who are not in physical proximity of the viewer. Due to these similarities, we expect that the effects of watching livestreams may mirror those observed in earlier studies on the effects of social TV (Kim et al., 2019).

Research shows that in the context of watching television, music, sports, or e-sports, the *live* component contributes to the sense of social connection and enhances the overall enjoyment of the experience (Kim et al., 2019; Mandryk et al., 2020; Song et al., 2019; Vandenberg et al., 2020). The need for real-time social connection seems to be especially strong for live entertainment experiences compared to recorded entertainment experiences. For example, people generally choose to co-view *live* television broadcasts because they do not want to watch the program alone (Doughty et al., 2012). Similarly, for music fans one of the main motivations to watch livestreams of their favourite musicians is to experience social presence (Ham & Lee, 2020) and feeling connected to other people who are physically located elsewhere (Biocca et al., 2003). Therefore, social presence may be a key underlying mechanism when studying the enjoyment and the potential positive well-being outcomes of watching a livestream concert.

The few studies that have investigated music or music livestreams during the pandemic suggested that these activities can bring enjoyment, stress-relief, calmness, maintain wellbeing and induce feelings of connectedness (Granot et al., 2021; Martínez-Castilla et al., 2021; Tanyildizi, 2020; Rendell, 2021; Vandenberg et al., 2020). While these studies which employed qualitative methodologies such as case studies and interviews provided valuable insights by highlighting that livestream concerts may be experienced differently than recorded concerts (Tanyildizi, 2020; Rendell, 2021; Vandenberg et al., 2020), there remains a need to investigate the potential underlying mechanisms as well as the cause-effect structure in a controlled setting to reach more generalizable findings. Therefore, the current study employed an online experiment to investigate the extent to which watching concert livestreams - compared to recorded concerts - affects viewers' perceived loneliness, social connectedness, and enjoyment of the media experience, and whether social presence mediates this effect.

2. Literature review and theoretical background

2.1. Concert viewing mode and social presence

The feeling of presence is one of the key psychological outcomes that accompany mediated communication experiences. While defining presence has been an ongoing endeavour across several disciplines, a common understanding of it refers to the feeling of “nonmediation” with regards to the perceptions of three dimensions, namely: space, self, and others in mediated experiences (Lombard & Jones, 2015, pp. 13–34). The first dimension might be considered one of the most commonly investigated type of presence, namely spatial presence, and refers to the sense of physically being located in the mediated environment (e.g., “I am there”; Biocca et al., 2003). Second, self-presence refers to perceiving the representation of the mediated self – such as an avatar – as a part of the user (e.g., “This is me”; Ratan, 2013). Finally, social presence refers to the feeling of being together with others in a mediated environment (e.g., “We are together”; Lombard & Ditton, 1997). To understand the effects of mediated live concerts social presence might be especially important.

While definitions of social presence also vary, they can be classified under three main clusters based on their specific focus: psychological involvement, behavioral engagement and copresence (Biocca et al., 2003). Firstly, theories that emphasize psychological involvement mainly aims to understand the role of factors such as intentionality, intelligence, and salience of mediated actors in generating a feeling of social presence (Biocca, 1997; Short et al., 1976). For instance, a non-playable character in a video game is expected to elicit social presence to the extent that they appear intelligent. Secondly, definitions of social presence that focus on behavioral outcomes aim to incorporate different ways of behavioral engagement such as eye contact, and turn-taking in an attempt to underline the richer interactive affordances of newer media (Biocca et al., 2003). The final category involves the understanding of social presence, in terms of copresence, which can refer to a feeling of being together in the same location (e.g., colocation) even though being physically apart, and a sense of being together (de Greef & IJsselstein, 2000; Harms & Biocca, 2004). The present study, focuses on the latter conceptualization of social presence, e.g., copresence, as we argue this is the most relevant definition that can potentially explain users' enjoyment as well help alleviate negative outcomes such as loneliness.

Several psychological theories such as Social Facilitation Theory (Zajonc, 1965), and Social Impact Theory (e.g., Latané, 1981) predict that the mere presence of others as well as social interactions may affect individuals' perceptions, attitudes, and behaviour. Although these theories predate most new technologies, they have been successfully applied to understand how the mere presence of virtual others in new media spaces can modulate media experiences (e.g., Li et al., 2022; Ang et al., 2018). For example, in a recent study, Ang et al. used the social impact theory as a framework to understand how virtual audiences in livestreams compared to recorded events can influence the viewing experience as well as the subsequent behavioural intentions (Ang et al., 2018).

Social impact theory suggests that three main factors influence people's experiences (Latané, 1981), namely the strength of the source (e.g., salience or importance of other people), the number of people involved, and the immediacy of the event (e.g., spatial, or temporal proximity). In the study by Ang et al. (2018) participants attended a hypothetical online marketing event for a product launch either via a simulated livestream (e.g., participants were told it was live) or by watching a recording of it. The livestream condition included stronger cues for social presence and immediacy (e.g., “live” indicator, more interactive chat) compared to the recorded version. Results showed that the livestream condition strengthened the effect of social presence on outcomes such as authenticity of the experience and intentions for further information seeking (Ang et al., 2018). While this study provided

initial evidence for how livestreams can influence viewer's experiences, the fact that the study did not actually employ a real livestream condition – but simulated one, and used a hypothetical scenario with fictitious products, call for further conceptual replication of these findings.

In line with the social facilitation and social impact theory, and recent empirical findings from the field of social TV and livestream events (Ang et al., 2018; Latané, 1981), it can be argued that watching a livestream concert with the opportunity to communicate with other viewers is expected to result in stronger levels of social presence compared to the recorded version. Concert livestreams are characterized by a higher number of social cues, in other words, higher levels of immediate interactions, compared to recordings. For instance, livestreams on social media platforms enable immediate and direct communication with other viewers as well as with streamers themselves. Users can typically interact with others by sending public and sometimes private messages. These interactions can range from conversations between people to opinions that are shared with the general audience. Users can typically share their emotions easily with emojis, emoticons, or other graphic-based reactions afforded by different platforms (e.g., hearts on Instagram live). In contrast, recordings of these concerts do not allow for active participation in such rich social interactions due to the lack of *liveness*.

The additive impact of social cues on social presence has been corroborated with a recent study which compared attending a livestream on Zoom vs. YouTube Live. Although participants reported social presence on both platforms, more social presence was reported for those attending via Zoom compared to YouTube Live; this difference between platforms was explained by participants being more aware of a social setting due to seeing other participants on Zoom (Onderdijk et al., 2021).

In addition to providing immediate interaction possibilities between the viewer and other audience members, previous research has also shown that *liveness* fosters collective feelings (Vandenberg et al., 2020), which in turn can enhance feelings of social presence. Therefore, we hypothesize that participants who attend the livestream of a concert (livestream mode) will perceive more social presence compared to participants who view the recorded version of the same concert (recorded mode) (H1).

2.2. Concert viewing mode and enjoyment

Next to being characterized by *immediacy*, livestreamed events are also characterized by their *indeterminacy*. The concept of *indeterminacy* in live television was used to explain the preference and heightened excitement experienced for live broadcasts compared to recorded content (Vosgerau et al., 2006). An *indeterminate* event such as a soccer game, loses its indeterminacy and hence partially its appeal when it is watched after it has taken place. Indeterminacy can be a characteristic of the process (e.g., an unscripted talk show) as well as the outcome of an event (e.g., score of a soccer game). When the process is perceived to be indetermined, it is shown to enhance the viewer's anticipated excitement (Vosgerau et al., 2006). A similar line of research found that being part of a real-time live event (e.g., a football game) is an important factor for the spectator's suspense (Knobloch-Westerwick et al., 2009). The suspense of an unpredictable result during sports broadcasts further predicts enjoyment (Peterson & Raney, 2008; Raney, 2013). A livestream concert can be defined as an indeterminate event because the process, in this case the performance of the artist or the band, is unpredictable to a certain extent. Therefore, due to their indeterminate nature (Ang et al., 2018; Vosgerau et al., 2006), which allows the viewers to be a witness to an unfolding social experience, and the suspense of the livestreamed event, we hypothesize livestream concerts to be more enjoyable to watch compared to recordings (H2a).

It is expected that the difference in enjoyment between concert viewing mode (live vs. recorded) can also be attributed to the enhanced feelings of social contact instigated by social presence. Previous

literature consistently showed positive relationships between social presence and enjoyment across various contexts such as in SNS use (Choi, 2016; Gao et al., 2018), instant messaging (Wang et al., 2012), online commerce (Kim, 2015) and gaming (Lee et al., 2012; Wang & Lee, 2020). Notably, within gaming research, the concept of social connectedness, as proposed by self-determination theory, emerges as a pivotal factor influencing the experience of enjoyment (Przybylski et al., 2010). Additionally, studies on Social TV viewing have shown that social presence and excitement are related (Hwang & Lim, 2015) and that social presence can mediate viewer's enjoyment (Kim et al., 2018, 2019, 2020, 2021; Song et al., 2019). In the context of livestream watching specifically, a study on Twitch users found social aspects, such as using the chat function, to be the main contributor to enjoyment (Wulf, Schneider, & Beckert, 2018). Thus, we hypothesize that social presence would mediate the effect of concert viewing mode (e.g., livestream vs. recorded) on enjoyment; with higher levels of social presence leading to higher enjoyment (H2b).

2.3. Concert viewing mode, loneliness, and social connectedness

Social distancing measures introduced during the pandemic were linked to intensified feelings of loneliness and a rising need for social connectedness (Banerjee & Rai, 2020; Bu et al., 2020; Loades et al., 2020). Loneliness is defined as a feeling of discrepancy between the desired and perceived levels of social relationships (Perlman & Peplau, 1981). Social connectedness refers to the subjective recognition of having (or not having) close relationships with the social world (Lee & Robbins, 1995). While loneliness and social connectedness may seem like similar concepts, social connectedness is a broader and more stable cognition that relates to the degree of one's sense of belongingness to other people or social groups (Lee & Robbins, 1998). Loneliness on the other hand can be conceptualized as a more temporary or transient psychological state which is often marked with emotional distress about lack of relationships (Perlman & Peplau, 1981). Loneliness has consistently been linked to various negative psychological and physical health outcomes (Leigh-Hunt et al., 2017). Similarly, a low level of social connectedness can make people feel distant from other people resulting in feelings of isolation (Lee & Robbins, 1995). Considering the mounting evidence linking the pandemic to loneliness, isolation, and lack of social connectedness as well as the negative prolonging effects on vulnerable groups, it becomes crucial to investigate whether these negative effects can be mitigated by means of online events such as livestream concerts (Dahlberg, 2021; Killgore et al., 2020; Loades et al., 2020; Pai & Vella, 2021).

According to the social compensation model, people can try to compensate for their loneliness or lack of social connections by indulging in mediated social environments (Caplan et al., 2009; Kim et al., 2018; Nebel & Ninaus, 2022; Song et al., 2014; Yang, 2016). For instance, lonely people have been shown to enjoy social TV viewing when they perceive social presence of others (Kim et al., 2018). Similarly, studies on platforms such as Twitch –which are mainly used for livestreaming games– have shown that viewers are socially motivated to engage in livestreams. Specifically, viewers are motivated to form new relationships, obtain a sense of community, establish a sense of belonging, have social interactions, and seek support from others (de Wit et al., 2020; Hamilton et al., 2014; Hilvert-Bruce et al., 2018; Li & Guo, 2021; Shen, 2020). Similar findings were also observed in a cross-cultural study across Germany, the US, and Japan which examined most popular platforms not focusing on gaming (e.g., YouNow, Ustream, and Periscope) and showed that livestreams fulfilled social needs such as socializing, and belonging (Friedländer, 2017).

In addition to the indirect evidence provided by studies on the effects of social TV, two recent studies – employing a survey and an exploratory thematic content analysis – have also provided initial evidence for the potential mitigating effects of livestreams for loneliness and restoring social connectedness during the pandemic (Goh et al., 2021;

Vandenberg et al., 2020). Specifically, frequency of livestream viewing has been linked to higher emotional, social, and psychological well-being as it moderated the negative effects of loneliness (Goh et al., 2021), and analyses of comments made by viewers of rave livestreams revealed that such livestreams – even though they potentially cannot replace the original concert experience fostered by physical proximity – can create feelings of social connectedness.

In short, a concert livestream on a social media platform allows the viewers to feel the virtual presence of likeminded people while experiencing an entertaining activity. Watching such a concert live as opposed to a recording of it can be an uplifting experience that could mitigate perceived loneliness and increase feelings of social connectedness due to higher levels of interactivity, richer social cues and social presence afforded in livestreams. Therefore, we hypothesize that watching the livestream concert will lead to lower levels of loneliness (H3a) and higher social connectedness (H4a) compared to the recorded concert, and these effects will be mediated by social presence (H3b, H4b).

2.4. Summary

The present study employed an online experiment to investigate whether watching a livestream versus a recorded concert can influence the viewing experience as well as consequent emotions. Specifically, we investigated whether livestream concerts can lead to more enjoyable experiences and can help alleviate loneliness and instigate social connectedness. Further, we investigated whether social presence is a significant underlying mechanism that can help explain these effects.

3. Method

3.1. Participants and procedure

An online two group between-subjects experiment (livestream vs recording) was conducted during May 2021 via Qualtrics. Data for the livestream condition was collected on the 2nd of May, the day of the livestream event. Next, data for the recorded condition was collected between the 10th and 15th of May. Participants in the recorded condition were exposed to the screen-recorded version of the livestream concert. The study was advertised on the university's website and on the band's and researcher's social media. Of the original 171 people who took part in the study, two were excluded, respectively for not completing the study and for reporting that they had not watched the concert video. Final data consisted of 169 participants between the ages of 16 and 68 years (see Table 1 for an overview of the demographics). Participants could choose to participate voluntarily or for research credits (provided they were students). About half of the participants (50.9 %) received research credits. All participants gave their consent at the start and at the end of the survey.

Table 1
Background characteristics of the participants.

Background characteristics	Recorded	Livestream	Total
<i>N</i>	95	74	169
Age			
<i>M</i> (<i>SD</i>)	23.08 (9.11)	25.39 (9.09)	24.10 (9.14)
Gender			
Men	16 (16.8 %)	14 (18.9 %)	30 (17.8 %)
Women	79 (83.2 %)	58 (78.4 %)	137 (81.1 %)
Non-Binary	0 (0.0 %)	2 (2.7 %)	2 (1.2 %)
Education level			
Less than a high school degree	4 (4.2 %)	5 (6.8 %)	9 (5.3 %)
High school degree	29 (30.5%)	21 (28.4 %)	50 (29.6 %)
Professional training	3 (3.2 %)	3 (4.1 %)	6 (3.6 %)
Bachelor's degree	50 (52.6 %)	30 (40.5 %)	80 (47.3 %)
Master's degree	9 (9.5 %)	14 (18.9 %)	23 (13.6 %)
Doctoral degree	0 (0.0 %)	1 (1.4 %)	1 (0.6 %)

3.2. Stimuli

Livestream concert. Date, time and the account hosting the livestream concert were communicated via the university website and the band's and researcher's social media. The band and researcher used their social media to remind their followers to join their streaming concert. The livestream concert was created specifically for the purpose of this study and consisted of a 22-min Instagram live concert by the German folk-pop band Ember Tales (@embertalesmusic). The concert started with the band introducing themselves and greeting the online audience and continued with four original songs performed by the band. At two points during the livestream (e.g., at 15min 45s and at 21min 35s), the singer reminded viewers to fill out the survey when the concert ended. These were the only times the band acknowledged the scientific purpose of their livestream concert. Participants were able to send 'likes' multiple times and comment in text form or with emojis during the livestream. All likes and comments were constantly visible for the online audience.

Recorded concert. The above-mentioned livestream concert was screen-recorded and embedded in the Qualtrics survey for the recorded concert mode. Participants were informed at the beginning of the survey that they would watch a concert video. The recording date of the video was not disclosed. The two moments where the singer reminded viewers to fill out the survey were removed from this version of the concert video to prevent confusion for the participants who were watching the concert in the online survey environment. All interactions between livestream viewers, such as comments and likes were visible in the video to keep the differences of the stimuli to a minimum. Participants in the recorded condition could not interact with other viewers in any form during the viewing.

3.3. Measures

3.3.1. Main variables

Concert viewing mode. The independent variable concert viewing mode was dummy coded into recorded (0) and livestream (1).

Social presence. Social presence was measured with the six-item co-presence subscale from the Networked Minds Measure of Social Presence (Harms & Biocca, 2004) using a 5-point Likert scale anchored from 1 (*completely disagree*) to 5 (*completely agree*). Example items include: "I noticed other viewers while watching the concert video" and "Other viewers noticed me while watching the concert video", Cronbach's $\alpha = 0.75$, $M = 2.81$, $SD = 0.77$.

Enjoyment. Enjoyment was measured with seven items from the Intrinsic Motivation Inventory (Deci & Ryan, 2007) using a 7-point Likert scale anchored from 1 (*strongly disagree*) to 7 (*strongly agree*). Items were slightly adapted to fit the present research, i.e., "I enjoyed watching this online concert very much", Cronbach's $\alpha = 0.94$, $M = 4.55$, $SD = 1.36$.

Loneliness. A short form of the revised UCLA Loneliness Scale consisting of eight items was used to measure participants' perceived loneliness (Russell et al., 1980; Roberts et al., 1993) with a 5-point Likert scale, 1 (*strongly disagree*) and 5 (*strongly agree*). Example items include "While watching the concert video, I lacked companionship" and "[...], I felt left out." An average score was calculated with high scores reflecting higher levels of perceived loneliness, Cronbach's $\alpha = 0.81$; $M = 2.83$, $SD = 0.78$.

Social connectedness. Social connectedness was measured with three items from the social connectedness scale (Lee & Robbins, 1995) using a 5-point Likert scale: 1 (*strongly disagree*) to 5 (*strongly agree*). An example item is: "While watching the concert video I felt so distant from people". The variable was reverse coded with high scores reflecting higher levels of social connectedness, Cronbach's $\alpha = 0.73$; $M = 3.48$, $SD = 0.99$.

3.3.2. Control variables

Exposure company. Exposure company was measured to assess whether participants were alone or had company while viewing the

concert. Participants answered the statement “I watched the online concert alone (e.g., no friends were next to me)” with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The variable was reverse coded to represent an increase in company with an increase in numerical value, $M = 1.99$, $SD = 1.61$.

Music preference. Participants’ music preference was measured with the statement: “The band’s music was similar to something I would listen to in my free time” on a 5-point Likert scale; 1 (*strongly disagree*) to 5 (*strongly agree*), $M = 2.93$, $SD = 1.32$.

Composition of the household. Participants were asked to indicate their living conditions (e.g., whether they lived alone or with others). Answer options included living alone, living alone with shared facilities (e.g., shared kitchen in student housing), living with others (e.g., partner, housemates, or family). The variable was recoded into living alone (0) and living with others (1). Most respondents—84.6%—reported living with others.

4. Results

4.1. Descriptive analyses

Correlations among all main and control variables were examined. In line with previous research, social presence correlated positively with enjoyment and social connectedness. These three variables also correlated negatively with loneliness. The control variables music preference and exposure company showed correlations with the dependent variables and therefore were added as covariates in the subsequent analyses (See Table 2 for details).

4.2. Hypotheses testing

To test the hypotheses, we ran three separate mediation analyses using PROCESS Model 4 for SPSS (Hayes, 2012). In all the models concert viewing mode was the independent variable and social presence was the mediator. The dependent variables were enjoyment, loneliness, and social connectedness, respectively. All models included exposure company, gender, music preference, and composition of household as covariates. We report all significant findings involving covariates in the results section (Please see Table 3 for a detailed overview of all findings).

The first two models including enjoyment and loneliness as dependent variables were significant. Enjoyment: $F(6, 160) = 18.32$, $p < 0.001$, $R^2 = 0.41$, loneliness: $F(6, 160) = 5.12$, $p < 0.001$, $R^2 = 0.16$. The model for social connectedness was not significant, $F(6, 160) = 1.81$, $p = 0.100$, $R^2 = 0.06$.

4.2.1. Concert viewing mode and social presence

In line with H1, concert viewing mode significantly predicted social presence—in all three models—with participants in the livestream condition reporting higher levels of social presence compared to the recorded condition, $b = 0.53$, $SE = 0.12$, $t = 4.53$, $p < 0.001$.

Table 2

Means, standard deviations and bivariate correlations between variables.

Variable	Overall		Recorded		Livestream		1	2	3	4	5	6	7	8
	M	SD	M	SD	M	SD								
1. Social presence	2.81	0.77	2.54	0.69	3.16	0.72	–							
2. Enjoyment	4.55	1.36	4.14	1.29	5.07	1.26	0.25**	–						
3. Loneliness	2.83	0.78	2.93	0.71	2.72	0.86	–0.19*	–0.40***	–					
4. Social connectedness	3.48	0.99	3.38	1.02	3.61	0.93	0.07	0.25**	–0.65***	–				
5. Exposure company	1.99	1.61	1.56	1.27	2.54	1.83	0.26**	0.17*	–0.30***	0.20*	–			
6. Gender ¹	0.82	0.39	0.83	0.38	0.81	0.40	–0.08	0.11	0.05	–0.11	–0.12	–		
7. Music preference	2.93	1.32	2.71	1.33	3.22	1.25	0.16*	0.59***	–0.26**	0.11	0.05	0.25**	–	
8. Composition of household	0.85	0.36	0.83	0.38	0.87	0.34	0.10	0.08	–0.03	–0.04	0.06	0.10	0.11	–

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$, $n = 169$.

Note: ¹Two participants identifying as non-binary were coded as missing values.

Gender (men = 0, women = 1). Composition of household (living alone = 0, living with others = 1). Concert viewing mode (recorded = 0, livestream = 1).

4.2.2. Concert viewing mode and enjoyment

In line with H2a, there was a direct effect of concert viewing mode on enjoyment, $b = 0.55$, $SE = 0.19$, $t = 2.87$, $p = 0.005$. Participants in the livestream condition reported higher levels of enjoyment, $M = 5.07$, $SD = 1.26$, compared to the recorded condition, $M = 4.14$, $SD = 1.29$. However, the indirect effect of concert mode on enjoyment via social presence (H2b) was not significant, $b = 0.07$, $SE = 0.07$, 95% CI [–0.07; 0.21]. The covariate music preference was significantly related to the enjoyment $b = 0.54$, $SE = 0.07$, $t = 8.07$, $p < 0.001$.

4.2.3. Concert viewing mode loneliness and social connectedness

There was no direct effect of concert viewing mode on loneliness, $b = 0.04$, $SE = 0.13$, $t = 0.31$, $p = 0.758$, and no indirect effect of concert mode on loneliness via social presence, $b = –0.04$, $SE = 0.05$, 95% CI [–0.14; 0.05]. Thus, H3a and H3b were rejected. The covariates music preference $b = –0.16$, $SE = 0.05$, $t = –3.48$, $p < 0.001$, and exposure company were significantly related to loneliness, $b = –0.13$, $SE = 0.04$, $t = –3.33$, $p = 0.024$.

Concert viewing mode did not have any direct effect on social connectedness, $b = 0.11$, $SE = 0.17$, $t = 0.64$, $p = 0.525$. Social presence did not mediate the relationship between concert mode and social connectedness, $b = –0.01$, $SE = 0.06$, 95% CI [–0.14; 0.11]. Thus, H4a and H4b were rejected. Additionally, the covariate exposure company was significantly related to social connectedness, $b = 0.10$, $SE = 0.05$, $t = 1.99$, $p = 0.048$.

5. Discussion

As COVID-19 continued to spread in early 2020, restrictions for containment were set in place which limited opportunities for social interaction and entertainment. As a result of isolation, many people suffered from loneliness and a lack of social connectedness (Debowska et al., 2022; Varga et al., 2021). Gaining popularity in this period, livestreamed events such as concerts became a flourishing part of entertainment business (Xu et al., 2023; Yahr, 2021). While previous research has shown the potential of co-viewing activities such as social TV or interactive livestreaming platforms like Twitch on propagating social feelings (Friedländer, 2017; Hamilton et al., 2014), we still have limited knowledge on how livestreamed events, specifically concerts are experienced and whether they can help mitigate negative feelings like loneliness or a lack of social connectedness. By comparing exposure to a livestream concert in real-time versus the recorded version of the same concert, the present study aimed to uncover whether the concert experience differed by viewing mode; expecting that watching the concert livestream would result in more positive outcomes - including enjoyment, social connectedness, and lower levels of experienced loneliness, through a stronger sense of social presence.

Table 3

Mediation analysis of the effect of concert viewing mode on enjoyment, loneliness, social connectedness, and with social presence as mediator. Exposure company, gender, music preference and composition of household are added as covariates.

Variables	Social presence				Enjoyment			
	b	SE	t	95% CI	b	SE	t	95% CI
Concert mode	0.53***	0.12	4.53	[0.30, 0.75]	0.55***	0.19	2.87	[0.17, 0.92]
Social presence	-	-	-	-	0.13	0.12	1.07	[-0.11, 0.37]
Exposure company	0.06	0.04	1.78	[-0.01, 0.13]	0.05	0.06	0.96	[-0.06, 0.16]
Gender	-0.17	0.15	-1.17	[-0.46, 0.12]	-0.00	0.23	-0.01	[-0.45, 0.44]
Music preference	0.07	0.04	1.51	[-0.02, 0.15]	0.54***	0.07	8.07	[0.41, 0.68]
Composition of household	0.15	0.15	1.00	[-0.15, 0.44]	0.03	0.23	0.12	[-0.43, 0.48]
Concert viewing mode X Social presence	-	-	-	-	0.07	0.07	-	[-0.07, 0.21]

Variables	Social presence				Loneliness			
	b	SE	t	95% CI	b	SE	t	95% CI
Concert mode	0.53***	0.12	4.53	[0.30, 0.75]	0.04	0.13	0.31	[-0.22, 0.30]
Social presence	-	-	-	-	-0.08	0.08	-0.90	[-0.24, 0.09]
Exposure company	0.06	0.04	1.78	[-0.01, 0.13]	-0.13***	0.04	-3.33	[-0.20, -0.05]
Gender	-0.17	0.15	-1.17	[-0.46, 0.12]	0.15	0.16	1.00	[-0.15, 0.46]
Music preference	0.07	0.04	1.51	[-0.02, 0.15]	-0.16***	0.05	-3.48	[-0.25, -0.07]
Composition of household	0.15	0.15	1.00	[-0.15, 0.44]	0.03	0.16	0.21	[-0.28, -0.35]
Concert viewing mode X Social presence	-	-	-	-	-0.04	0.05	-	[-0.14, 0.05]

Variables	Social presence				Social connectedness			
	b	SE	t	95% CI	b	SE	T	95% CI
Concert mode	0.53***	0.12	4.53	[0.30, 0.75]	0.11	0.17	0.64	[-0.23, 0.45]
Social presence	-	-	-	-	-0.02	0.11	-0.19	[-0.24, 0.20]
Exposure company	0.06	0.04	1.78	[-0.01, 0.13]	0.10*	0.05	1.99	[0.00, 0.20]
Gender	-0.17	0.15	-1.17	[-0.46, 0.12]	-0.29	0.21	-1.39	[-0.70, 0.12]
Music preference	0.07	0.04	1.51	[-0.02, 0.15]	0.09	0.06	1.48	[-0.03, 0.21]
Composition of household	0.15	0.15	1.00	[-0.15, 0.44]	-0.13	0.21	-0.61	[-0.55, 0.29]
Concert viewing mode X Social presence	-	-	-	-	-0.01	0.06	-	[-0.14, 0.11]

*p = 0.05. **p = 0.01. ***p < 0.001, n = 167.

Note. Mediation models; Social presence: F (5,161) = 8.43, R² = 0.2, p < 0.001; Enjoyment: F (6,160) = 18.32, R² = 0.41, p < 0.001; Loneliness: F (6, 160) = 5.12, R² = 0.16, p < 0.001; Social connectedness: F (6, 160) = 1.81, R² = 0.06, p = 0.100.

Gender (men = 0, women = 1, non-binary and prefer not to say = missing values).

Composition of household (living alone = 0, living with others = 1).

Concert viewing mode (recorded = 0, livestream = 1).

5.1. Main findings

Consistent with Hypothesis 1, we found that concert viewing mode influenced social presence experienced by participants. Specifically, viewing a livestream concert led to higher levels of social presence compared to viewing a recorded version of it. So far, this relationship has been partially tested in the context of an imaginary online product launch using a simulated live-viewing scenario whereby viewing condition (e.g., simulated live-viewing vs. recorded viewing) moderated the effect of social presence on outcomes such as authentic consumer experiences (Ang et al., 2018). Similarly findings also support research which showed that, viewers of Twitch particularly enjoy social cues and community participation during livestreams (Wulf et al., 2018). The present study added to this literature as being one of the first to provide preliminary causal evidence for the direct relationship between viewing mode (e.g., livestream vs. recorded) and social presence. Our findings suggest that the specific affordances of livestream events such as the possibility to immediately interact with the audience may enhance social presence in the context of entertainment media. Given that both the livestream and the recorded version of the concert included the same social cues, the difference in social presence is argued to stem from the *liveness* and *immediacy* aspects of the livestream condition. In other words, it appears that to experience higher levels of social presence, it is not only enough to see others interact as in the recorded version but rather have the possibility to join these interactions or view them as these interactions unfold in real time.

A secondary aim of the study was to understand whether the

emotional experiences resulting from viewing a livestream concert such as enjoyment were affected by concert mode and potentially mediated by social presence. The main expected outcome of entertainment experiences is enjoyment and one of the main reasons why people watch concerts is to be entertained (Kim et al., 2018; Song et al., 2019). However, the levels of enjoyment of entertainment experiences of identical content are expected to be contingent on the liveness of the content. For example, Vosgerau et al. (2006) showed that people reported higher anticipated excitement for a live broadcast of a football match compared to watching a prerecording of the same match – even if they had not seen it before. These findings are consistent with research on live sportscasts suggesting that live-events increase suspense and unpredictability of the game result which positively predict enjoyment (Knobloch-Westerwick et al., 2009; Peterson & Raney, 2008; Peterson, 2013). In line with these findings and our second hypothesis, we found that viewers who joined the livestream concert in real-time reported higher levels of enjoyment than those who watched the recorded concert. As such, our findings contribute to existing knowledge showing that livestreams do not only affect anticipated enjoyment (e.g., Vosgerau et al., 2006) but also actual enjoyment. Moreover, our findings show that previous knowledge about sports broadcasts and enjoyment can translate to other parts of the entertainment industry, e.g. concert livestreams.

The difference in enjoyment was in part expected to result from differences in social presence (H2b), however, no mediating effect of social presence was observed. Therefore, we suggest that the underlying mechanism that drove this effect on enjoyment is more related to the

indeterminacy of the experience rather than the availability of the social cues. Future research should systematically investigate how exactly the different affordances of a livestream such as the indeterminacy, possibility to interact with others, richness and relevance of social cues each contribute to enjoyment.

The emotional experiences of concerts are not limited to hedonic enjoyment but also include the socio-emotional response states. In contrast to our expectations, we did not find evidence for the effect of concert viewing mode on loneliness and social connectedness. Previous research on livestream viewing found the activity to foster feelings of social connectedness and mitigate loneliness (Goh et al., 2021; Vandenberg et al., 2020). Even though the livestream condition resulted in less loneliness and more social connectedness than the recorded condition, these differences were not significant and overall participants reported feeling rather not lonely and moderately socially connected. These findings suggest that in the current study a livestream concert did not create a different enough experience to influence feelings of loneliness, or a lack of social connectedness compared to a recorded event. It is also possible that, during the time of data collection (e.g., May 2021), due to relaxing of the restrictions, our participants might not have felt as lonely, isolated, and in need of virtual companionship as they did during stricter lockdown phases. This might have attenuated the potential social compensation that the participants might have received from the concert situation. Lastly, effects on loneliness and social connectedness might only become significant once the livestream watching frequency of the viewer increases (Goh et al., 2021). Similarly, the effects might be more pronounced for groups that are vulnerable to isolation such as the elderly (Beardmore et al., 2023), people who are already suffering from loneliness (Kim et al., 2018); or people going through difficulties in life (de Wit et al., 2020), which was not captured in the present study.

Even though social presence differed between concert modes, social presence did not affect – nor mediate – loneliness or social connectedness. This might suggest that even though participants did feel a difference in the presence of others this was not enough to compensate or was not strong enough to influence these outcomes. Perhaps viewers of concert livestreams were more engaged in the musical performance and enjoyed the unpredictability of the live broadcast, but not necessarily the social presence of other viewers. However, further research that compares a real-life concert with its livestream is needed to see whether livestreams can be an effective alternative that can mitigate loneliness or lack of social connectedness. Better understanding of livestreams can guide the creation of stronger emotional experiences as this could be used to build more inclusive concert experiences, for example allowing people who cannot attend real-life concerts due to (temporary) physical disabilities.

Finally, an interesting finding was that participants' music preference positively affected enjoyment and negatively affected loneliness. Participants who had similar music preference to the performing band were less inclined to feel lonely. Future studies should therefore consider collecting data about appreciation of the viewed content, to measure effects not only on enjoyment, but on loneliness too. Hence, we may expect that the alleviating effect of music may be contingent on genre preferences.

5.2. Limitations

Although the current study has provided several new insights and the experimental design makes it possible to draw causality-based conclusions, there are also at least three limitations that need to be mentioned. First, while the current experiment shows high internal validity, it is important to recognize the somewhat limited external validity. The participants did not choose to attend this livestream but watched it as part of a research study. Moreover, although the livestream featured a professional band, the quality of livestreams, especially compared to those put on by bigger artists, might be experienced as less cutting-edge. Consequently, we might expect more pronounced effects in a real-life

setting. In addition, to limited external validity, the current experimental design did not randomly assign participants to the different conditions. To ensure enough participants would be included in the livestream condition, data collection for this condition was prioritized. Although this resulted in a non-randomized assignment of the participants, the two groups did not differ on some of the key demographics. However, to limit any selection effects we recommend that future research employs a randomized assignment of participants. This will be possible if there is a longer time window between recruitment and the live event.

Moreover, the current study made use of a concert experience in the Instagram platform (2D) with audience comments visible in both the live and recorded condition. These platform features could have unique effects on the findings. With regards to the first, it is important consider the impact of the immersiveness of the technology. Even though Instagram concerts are easily accessible, they are not as immersive as concerts that can be viewed on larger screens or on immersive media platforms such as VR. It is possible that, in more immersive contexts, social presence might exert stronger influences on emotional outcomes. With regards to the second, it is important to realize comments can serve as social cues. In an actual Instagram Live recording, typically commentary would not be present while reviewing the recording. Therefore, it is possible that the presence of these social cues in the recorded condition might have attenuated our findings by enhancing social presence more compared to if these cues would not be available. At the same time, other platforms do offer viewers the opportunity to view recorded versions of a live event with comments that were given during that event on screen. For example, Chinese platforms such as Bilibili are known for *danmu*, a feature allowing the replaying of superimposed comments left at an earlier time (Liu et al., 2016). Thus, future research would benefit from comparing three conditions, the live event with live chat interactions, the recorded event with recorded chat interactions, and the recorded event without recorded chat interactions. This would make it possible to assess the unique contribution of expanding the number of social cues.

Finally, the sample was skewed in terms of age, gender, and level of education as the average respondent was female, in their early twenties and highly educated, thus limiting the generalizability of the findings. Future research should include more diverse samples to assess the robustness of the findings.

5.3. Conclusion

The present study examined whether viewing mode of a concert (e.g., livestream versus its recording) can enhance enjoyment of the viewing experience, support social connectedness, and alleviate loneliness. Further, social presence was investigated as an underlying mechanism for these effects. We found that participants did indeed enjoy watching a livestream concert more than its recording. While social presence was not found to be a significant mediator in this relationship, participants did report higher levels of social presence in the livestream condition supporting the assertion that livestreams may afford richer social cues and interactions. However, contrary to our expectations no significant effects on loneliness and social connectedness were observed in the present study.

Organizing live social media events and screen recording them allows researchers to better understand the impact of liveness offered by livestreams. It enhances the ecological validity compared to using hypothetical scenarios, while at the same time offers researchers the opportunity to include identical content in their control conditions. We feel that this methodological approach offers researchers interested in the ever more popular online social events a promising avenue for future research. Moreover, it broadens existing knowledge about the effects of sportscasts and gaming livestreams on mental wellbeing.

In conclusion, a key implication of the present study is that affordances of livestreams can certainly aid in enhancing social presence. The

possibility to contribute or view the interactions in real time can be sufficient to increase feelings of social presence. Hence, platforms should consider exploring features that foster increased user interaction, offering enhanced social cues to amplify the sense of social presence. Moreover, there is merit in preserving these social cues and potentially facilitating messaging capabilities also in the recorded versions of live-stream events. Secondly, even though livestream events can be more enjoyable than recorded ones, there is more to this process than that can be explained by social presence. While connectedness is one of the key predictors of enjoyment, it might also be beneficial to explore other key mechanisms such as gamification elements that promote competency and agency into these platforms to further enhance overall user experience (Przybylski et al., 2010). This is especially relevant considering the positive effects of enjoyment on intentions to continued use (Mouakket, 2015; Wu & Liu, 2007). A final implication is that, while livestreams show promise in mitigating the negative effects of isolation, further research is needed to determine the specific conditions and demographics where they can be effective alternatives to in-person experiences.

CRedit authorship contribution statement

Sophie T. Kulla: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Hande Sungur:** Conceptualization, Methodology, Supervision, Writing – original draft, Writing – review & editing. **Sindy R. Sumter:** Conceptualization, Supervision, Writing – original draft, Writing – review & editing.

Declaration of competing interest

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

Data availability

Data will be made available on request.

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