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Distraction vs Immersion: Use of 360-format Videos in News Storytelling

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Abstract: *The study aims to explore 360-format videos in the genre of news storytelling. 360 format videos are wide spectrum videos providing users with a first-hand experience of the event or situation. It transports the users to a virtual space without changing their location. The first-person experience offers immersion a combination of presence and attention. The presence here deals with emotional factors immersive attention refers to the cognition and information-processing ability of the users. The immersive property has found its place in the news industry as well. However, for news storytelling, the content needs to be immersive in both empathy and attention factors. The study intends to identify whether 360-format videos create attention or distraction in news storytelling where distraction is a measure of loss of attention. The study developed a framework based on the theory of the Limited Capacity model for mediated messages memory retention. The experiment was conducted with a sample of n=30 participants who were shown a 360-format video "Punch with Pakistani Girl" on Oculus Quest and pre and post-tests were administered. The results obtained by descriptive analysis are consistent and showed a varied and low attention level of participants of the study. The research implies that the additional visual information in 360 videos serves as a distraction for users and must be eliminated through techniques of navigation and angular placement.*

Introduction

Media is becoming immersive with the advent of modern technologies. Two-dimensional media viewing is now merging with multi-dimensional viewing. The VR, AR, and MR era has converged with 360-format videos. The idea of a multidimensional view is being explored in actual situations and in virtual, augmented, and mixed reality. 360 videos are wide-spectrum videos. They provide a three-dimensional view of a scene. 360 videos are spherical videos. Users can view more than one viewpoint through a single video. The environment being filmed can be viewed without any framing limitations as in two-dimensional videos (Aronson-Rath et al., 2016; Zhao et al., 2021). Journalism is a set of principles encompassing truthfulness, timeliness, and providing meaning to everyday events through newspaper and broadcast institutions. News values, gatekeeping, news frames, and ideological routines form the basis of journalism. Journalism is not bound to a specific medium. It has evolved with technology. Immersive journalism is developing news to give users a multi-modal and multi-sensory firsthand experience of the event. This is also known as interactive journalism. The 360-degree video technology when in use for journalistic purposes alters the production, transmission, and reception of news. The realistic sensory experience with a load of stimuli creates empathy. The realistic experience is central to immersive VR 360 videos. Immersive journalism is different from other media in its experience of news. It makes the concept of news consumption a more personalized experience. It can be called Meta digital media revolution (Baía Reis & Coelho, 2018; Deuze, 2019; Kool, 2016).

360-degree videos are used for content production and consumption. The idea of accessing an environment that was previously bounded by frames is an exciting approach. The increase in the use of Head-mounted displays, and 360° cameras have made the technology more popular. Limiting the field of

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view by framing it was one way of directing visual attention to the subject. In 360-degree videos, there is no frame. Users are decision-makers and an overload of stimuli is available for the user to respond to. Immersive news storytelling when explored on parameters of usability, utility, emotion, and immersion lacks the usability and utility features of a journalistic video. The videos are viewed from an emotional perspective with an interest in experiencing Immersiveness. The larger field of view reduces cognition by distracting the user from the subject. Hence, it is significant to identify the use of 360-degree videos in news storytelling (Godulla et al., 2021; Lang et al., 2000; Nguyen et al., 2018). The sense of being present leads to an increase in the immersive experience for the user. Greater immersion creates a greater sense of presence and emotional involvement. The greater spectrum gives a wider view and many artifacts that create a distraction. There is a need to identify whether 360 videos are used for news reporting or news telling (Barreda-Ángeles et al., 2020; Van Damme et al., 2019).

Research Objective

- To determine whether videos in 360 format create distraction or immersion for news story viewers.

Research Question

- What degree of attention or distraction is created by 360-format news story videos?

Literature Review

Immersive media technologies have been under experimentation since the 1960s when real-time multi-dimensional computer graphics were introduced to haptic devices with the characteristics of virtual touch and spatial sounds. 360-degree video technology evolved with virtual reality since the 1950s. Sensorama was an interactive machine developed to experience bicycle riding via 3d graphic photos and sound. The technology was revived in the 1990s when the Air Force took an interest in it and used the analogy in training centers. As popularity increased, technology was being used for gaming and entertainment purposes. The invention of Occulus devices with controllers started a new wave of 360-degree videos. 360-format videos have different types. Spherical videos are rectangular videos that are recorded from multiple cameras and stitched together. The viewers view these videos by scrolling and dragging them on mobile phones. On the other hand doughnut or cylindrical videos is the one that is panoramic videos and can be recorded easily via 360-degree cameras such as Insta 360, GoPro, Ricotheta, etc (Westmoreland, 2020). 360-format videos have widely been used in news-making and storytelling purposes. An investigation of news pieces from NYT VR was conducted in research to identify the form and content of 360-degree news reports. The textual analysis of content showed that 360-format videos create a visual depth for viewers. The sensory depth enhances the sense of the presence of the user. The interaction in the video is to the extent of head movement to explore the surroundings. The journalist has no authority. Users are free to respond to stimuli they want. The 360 videos omit journalists from the story (Palmer, 2020). Another study uses experimentation to analyze the progression and copresence properties of the medium. The results showed that the effectiveness of 360-degree videos is entirely based on the techniques and technology used to experience them. The co-presence varies depending on the type of news story (Pérez-Seijo et al., 2022). 360-degree videos are also used for organizational communication. The videos are used to bring forward the realities of the area of humanitarian disasters and highlight the organizational efforts in providing aid. To analyze organizational communication by 360-video A case study of Humanitarian aid by NGOs such as the Red Cross, Doctors Without Borders, Save the Children, and World Vision International is conducted. The results highlighted that apart from the efforts, digital manipulation is possible. However, the subjects are visible and viewers can develop emotional bonds with them even if they are not present. The NGOs are subjected to responsible presentation following the ethical guidelines to develop greater impacts (Pérez-Seijo & García-Orosa, 2020).

Immersive journalism is the production of news in an approach to give users a real-life experience of occurrence and situation. The term "Immersive journalism" was given by De la Peña et al. (2010). De la Peña et al. (2010) have identified immersive journalism which uses feeling the presence in the event being reported and represented in the form of an avatar. The users can be a participant in the story. The immersive environment allows users to be the deciders. They choose what to look at and what to not. The

environment may be virtual, real life recorded on a 360-degree camera, or a cross-reality merging VR, 360 AR, and MR. The sense of presence it offers is what differentiates it from other media technologies. The walls of the frame do not bind the users. They have a bigger environment to explore and experience. They get to choose the piece of information they receive. Researchers argue that immersive storytelling can develop and enhance emotional links to people, events, and stories (Uskali et al., 2021). In immersive journalism news, reports are sought to be of three types. One is a reporter which means either a reporter narrates or a voiceover narrator is present to guide the news story. The second type is source in which the source or subject narrates its story without the presence of a reporter. The third type is a neutral narration in which users are free to view the content without any reporter or voice-over interruption. In each type of news, the immersive experience exists but varies as well (Sirkkunen et al., 2020). Immersive journalism and journalism demand the presence of some common characteristics of accuracy, credibility, and fact check along with the individual characteristics of each media. Immersive journalism is carried out in two ways, that are either real-time coverage of incidents or a computer-generated graphical representation of incidents. The degree of accuracy and truthfulness varies for both. Project Syria is a VR production of Syrian refugee camps. The independence is reduced since the video is guided by the audio of a male reporter. Accountability and transparency are doubtful factors. Immersive journalism hence is a bit different from traditional journalism in rules. The fear of missing out, objectivity, invasion of privacy, and emotional connection are evident. A particular opinion observed is that immersive journalism is a powerful experience with a lesser understanding of the event happening. (Flatlandsmo & Gynnild, 2021; Jones, 2021a).

Framework

The study used the Limited Capacity Model for Mediated Media Messages to develop a framework for the research in convergence with the core concept of attention recognized as the five effects to perceive, conceive, distinguish, remember, and shorten the reaction time. LC4MP is an information processing model that conceptualizes the human abilities to process information or news. The limited capacity model of media-motivated message processing is the model that aids in understanding and exploring the processing of media messages in real time. This model is based on some basic tactical assumptions which are being discussed here. The first assumption of the model is that humans have a finite capacity to process messages or information. The second assumption focuses that humans are naturally motivated in two ways towards the media messages. Either they are appetitive towards the messages, or they show a disinclination for the messages or information. The third assumption characterizes media as a continuity of messages that are on distinct levels of importance. The fourth assumption states that humans act over a period. The 5th and last assumption states that communication is a dynamic process occurring between media messages and message recipients (Fisher & Weber, 2020; Nabi & Oliver, 2009; Park, 2008). The study derived the theoretical implications of the Limited Capacity Model of Mediated message processing and will use that to identify the existence of the relationship between the variables. The strength of the model lies in its applicability to any sort of technology used for information processing. Memory recollection is the core of this model. It relates the mediated message with the viewers' cognition to analyze the active engagement of viewers in the news story. In memory, it argues to measure the amount of information processed by the news story viewer. Memory or Recall is also an important aspect of this study. The research implies the Memory assumption from the model and relates it with immersion and Distraction. In LC4MP, memory is measured through encoding, storage, and retrieval. To measure this, LC4MP proposes a recognition test (Nabi & Oliver, 2009). The current research measures Immersion and distraction created by viewing news in 360-degree videos.

Hypothesis: A higher recall rate of intravenous objects in 360-degree environments will correlate with a lower recall of the primary narrative of the news story.

Methodology

The research design is focused on investigating the cause-and-effect relationship between the variables. This type of study design is classified as an experimental research design. Experimental research design is used to investigate a phenomenon by introducing the intervention that can produce the cause. This is done to observe the change. The cause-and-effect relationship between the involved variables is studied.

The operationalization of immersion in this research design is a measure of attention. Distraction in conceptual terms is the loss of attention of the user in the content. Attention and distraction are measured in two ways. At first, The gain or loss of attention is measured through coordinated head movements. A coordinated head movement is a measure of attention whereas an uncoordinated head movement is a measure of distraction (Miller, 2005; Yu & Smith, 2016). The study design used will be a Pre-experiment research design and the effects of the independent variable will be measured on the group. The effect of 360 videos on immersion and distraction will be measured by subjecting a group of participants to the independent variable i.e. 360-news story video. The participants will be settled in a controlled setting. At the start of the experiment, participants will be given a brief introduction to the 360 videos. The participants then will be exposed to 360-format video stimuli on an HMD display. The head-mounted display used for the experiment will be Oculus Quest. The participants will view the 360-new story video. Data will be collected through self-report measures are obtained via a questionnaire administered before and after the experiment. Secondary data has also been used to identify participants' numbers.

The questions are designed in two sections The first section is administered before the experiment and will collect the demographics of participants and their knowledge of 360 format video technology. The second section administered five-point Likert scale questions divided into categories between strongly agreeing to strongly disagreeing. It will assess the experience and attention of participants after the experiment (Argyriou, Economou, & Bouki, 2020). The stimulus will be the 360 video news pieces that the participants will watch. The news items have been selected from the Channel The New York Times NYTVR platform. The proposed channel was selected as they were the pioneers in experimenting with 360 technology in making news items. It has created a total of 300-500 videos using 360-degree technology (Sirkkunen et al., 2020). The news story selected is a video of 1 minute 42 seconds constituting different issues. The video selected is from the New York Times titled, "Punch with Pakistani Girls". The reason for selection is its geographical and contextual proximity to the social experiment being conducted.(Vindenes & Gynnild, 2021). Punch with Pakistani Girl is a new story depicting two girls who are being trained for boxing in a local boxing club in Karachi, Pakistan. The video is self-narrated (Sirkkunen et al., 2020). The population of the research is the students of the Media and Communication Department of Riphah International University, Rawalpindi. A total of 30 participants (n=30) selected through convenient sampling participated in the study. The number of participants was identified by the secondary data collection. The already existing work on the subject was studied. The number of participants was a calculated mean of the previous research's samples (Wimmer & Dominick, 2011). This research uses Descriptive and causal analysis to analyze the data collected from experiments. Descriptive analysis is implied descriptive statistics to measure central tendencies and frequencies of the data collected. Along with descriptive analysis, this research also uses Causal analysis to determine the relationship between the variables involved in the study (Neuman, 2007).

Data Analysis and Results

The current study has analyzed data for pre and post-experiment responses. The demographics inquired about their age and education and their familiarity with 360 format videos and HMD devices. The participants were shown the video "Punch with Pakistani Girl" on an HMD device. Participants were asked to fill up the post-test form. Out of the 30 participants, there were two female and 28 male participants. 18 identified themselves in the age group of 16-20 and 12 identified themselves within the age group of 21-25. The study is not based on gender segregation and participants are selected through convenient sampling. In the pre-test, the participants were also asked about the devices they used to watch 360 videos. The responses showed that 4 participants used computers, 19 used Mobile Phones, 5 used VR headsets, and 2 marked others as they were not frequent viewers of 360 videos. The participants were asked about their preferred genre and if they would watch 360 videos. 4 out of 30 participants stated that they would watch history, 11 marked nature, 3 marked disasters, 4 marked Adventure, and 8 marked Horror as their preferred genre of 360 videos. At the end of the pre-test participants were asked about their familiarity with the term:360-format news story videos". The table shows the frequency calculation of the responses. 14 out of 30 participants gave affirmative responses whereas 16 remaining participants gave a negative response to the question. It indicated that 47 percent of participants were familiar with the term whereas 53 percent of participants were unfamiliar.

Figure 1
Standard Arrangement to Measure Angular Kinematics for Head Movement
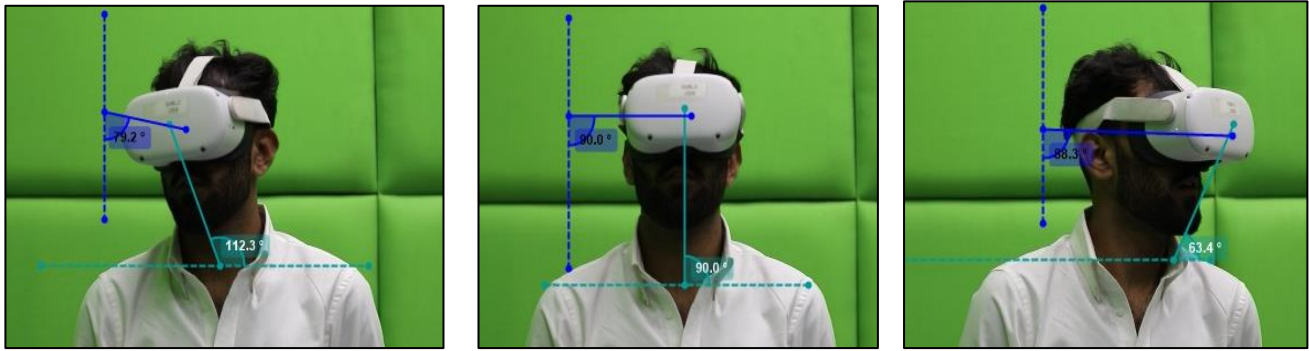
Participants were shown the video on Oculus Quest 2 and were administered a post-test questionnaire that contained a recall test based on open-ended questions and a section measuring their attention and distraction on a 5-point Likert scale. The answers to the recall test were coded and analyzed for frequencies on SPSS. The participants were asked about the context of the story. 16.7% of participants identified the context as a Boxing club. 36% identified it to be Boxing Girls, and 333% identified it as the story of two girls. 3% identified it as women empowerment, 3% identified the context as Gender Equality and 6.7% mentioned others such as the harassment in the transportation system in Karachi. The participant's responses on the subject of the video showed that 26.7% of participants recognized Boxing girls as the subjects of the video. 36.7% identified Boxing Coach as the subject of the video. Whereas 36.7% identified the father of two girls as the subject of the news story. The participant responses on location identification that 6.7% of participants identified the location as Krachi Lyaari, 50% as a boxing club, 23.3% as House of the Girls, 13.3% identified the location as rickshaw, and buses collectively termed as other in coding. And 6.7% of participants identified no clear location coded as none.

Table 1
Frequency Table on Key Issues in the News Story

Key Issues				
	Frequency	Percent	Valid Percent	Cumulative Percent
Societal Unacceptance	6	20.0	20.0	20.0
Travelling Issues	1	3.3	3.3	23.3
Lack Of Opportunities	1	3.3	3.3	26.7
Unsafe Environment	1	3.3	3.3	30.0
Financial Issues	8	26.7	26.7	56.7
Struggle of girls	4	13.3	13.3	70.0
restrictions on girls	1	3.3	3.3	73.3
Absence of Male support	1	3.3	3.3	76.7
backward area	2	6.7	6.7	83.3
Girl education	1	3.3	3.3	86.7
no issue	4	13.3	13.3	100.0
Total	30	100.0	100.0	

The table shows the key issues in the news story as identified by the participants. Out of 30 participants of the study 8 have identified financial issues, 6 have identified Social Unacceptance, 4 have identified struggles of girls, and 2 identified Backward areas as the key issue. 6 participants each identified traveling, Lack of opportunities, Unsafe environment, Restriction on girls, absence of male support, and girl education as the key issue of the news story. Whereas 4 participants identified no key issues in the news story.

Table 2

Frequency Table on Visual Cues in the Story

Visual Cues				
	Frequency	Percent	Valid Percent	Cumulative Percent
Punches	7	23.3	23.3	23.3
Rickshaw	3	10.0	10.0	33.3
Boxing Girls	1	3.3	3.3	36.7
Boxing Ring	1	3.3	3.3	40.0
Girls Cooking at Home	1	3.3	3.3	43.3
Girls tying Shoe Lace	2	6.7	6.7	50.0
None	12	40.0	40.0	90.0
Other	3	10.0	10.0	100.0
Total	30	100.0	100.0	

The visual cues identified by the participants have been shown in the table. Punches were visual cues to 7 participants, Rickshaw to 3, Boxing girls, Boxing ring, and Cooking at home by one each. 12 recognized no visual cues, and 3 identified the cues are codes other.

Table 3

Frequency Table on Audio Cues in the Story

Audio Cues				
	Frequency	Percent	Valid Percent	Cumulative Percent
Punches	7	23.3	23.3	23.3
Rickshaw Noise	6	20.0	20.0	43.3
Narration	8	26.7	26.7	70.0
none	9	30.0	30.0	100.0
Total	30	100.0	100.0	

The table shows the audio cues given by the participants. Out of 30 participants 7 mentioned punching noises, and 8 mentioned narrations as the audio cues that attract their attention. 6 mentioned rickshaw noise whereas the remaining 9 participants identified no audio cues in the video.

Participants were also asked about prominent characters in the news story. 11 participants found Boxing Girls, 9 recognized Fathers, 2 Identified other girls in the boxing club, and 1 identified mother as a prominent character. However, 7 participants identified no prominent characters in news stories.

Participants were inquired about immersion and distraction on a five-point Likert scale.

Table 4

Frequency Table on Likert Scale Responses

	Video Captured My Attention		Easy To Focus		Enhanced Immersion		Remember Important Details		Feel To Actively Shift Focus		Medium Makes It Difficult To Focus On Subject		Attention Drifted from main Content		Feel Distracted By Additional Visual Information		Format Hindered The Understanding Of Content		Feel Uncomfortable Moving Around	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Strongly Disagree	3	10.0	5	16.7			2	6.7			1	3.3			2	6.7			7	23.3
Disagree	7	23.3	6	20.0	1	3.3	9	30.0			6	20.0	5	16.7	6	20.0	6	20.0	6	20.0
Neutral	6	20.0	7	23.3	15	50.0	8	26.7	7	23.3	5	16.7	9	30.0	6	20.0	7	23.3	4	13.3
Agree	9	30.0	6	20.0	12	40.0	8	26.7	8	26.7	12	40.0	11	36.7	11	36.7	12	40.0	8	26.7
Strongly Agree	5	16.7	6	20.0	2	6.7	3	10.0	15	50.0	6	20.0	5	16.7	5	16.7	5	16.7	5	16.7
Total	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0

The table of descriptive statistics shows the mean and standard deviation values of the Post-test analysis. The low values of Standard deviation show that the data is less scattered. The data set is clustered around the mean which means the responses are consistent and similar relatively.

Table 5

Descriptive Statistics of The Post-Test

Descriptive Statistics						
	N	Mean	Mode	Minimum	Maximum	Std. Deviation
Video Captured My Attention	30	3.20	3	2	5	.682
Easy To Focus	30	3.07	4	1	5	1.129
Enhanced Immersion	30	3.50	3	3	5	.828
Remember important Details	30	3.03	2	1	5	1.137
Feel To Actively Shift Focus	30	4.27	5	2	5	.973
Medium Makes It Difficult To Focus On Subject	30	3.53	4	1	5	1.221
Attention Drifted from main Content	30	3.53	4	1	5	1.270
Difficult To Remember Specific Details	30	3.40	4	1	5	1.388
Feel Distracted By Additional Visual Information	30	3.37	4	1	5	1.189
Format Hindered The Understanding Of Content	30	3.53	4	2	5	1.008
Feel Uncomfortable Moving Around	30	2.93	4	1	5	1.461
Valid N (listwise)	30					

Discussions

The current study was focused on exploring the immersion and distraction that 360-format news story video offers. The study was conducted via experimentation. The selected news story video was shown to 30 participants selected through convenient sampling. The participants were asked questions pre-experiment to analyze their knowledge of 360 videos. The results of the Pre-test analysis show that participants are aware of 360 medium and its usage. People are more likely to watch nature adventure and horror-based videos in 360 formats. This can be interpreted as they tend to enjoy the format however participants had very little knowledge of the usage of 360 format videos in news stories or journalism. With the initial demographic analysis, the research focused on inquiring about the research question posed. Post-experiment responses showed that 46% of participants agreed that the video caught their attention. 11% however strongly negated the point that it was easy to focus on the video. 40% of them are of the view that video enhanced immersion as they feel located inside the video. At the same time, 37% were of the view that it was difficult to remember details. 50% were also of the view that the format made them feel to actively shift focus. Hence notwithstanding a single point of attention. 60% agree that the medium made it difficult to focus on the subject and their attention kept drifting from the subject. 37% were also of the view that the extensive visual information increased their distraction and 60% agreed that the format hindered their understanding.

Immersive media has gained attention in recent years. The technology uses multiple techniques to make the presentation of content immersive. 360-format videos are panoramic videos with a six-dimensional field of view that offers a sense of presence to the audience. Along with this, the navigability feature has enhanced its immersive value. People tend to use Head-mounted displays to view high-resolution 360-format content. The increasing interest of the public in technology has compelled the news and journalism industry to experiment with it. News giants such as Euro News, NewYork Times, BBC, CNN, and many others have started producing journalistic stories in 360 format. This has led to a phenomenon called immersive journalism (De la Peña et al., 2010; Jones, 2021a, 2021b; Phillips et al., 2019). The current study aimed to explore the distraction property in 360-format news story video as compared to attention.

Attention is an ability that limits the human brain to focus on one stimulus at a time. The multiple stimuli make it difficult for the user to focus on one point and hence create a distraction or what is called a loss of attention. The format though immersive reduces the cognitive abilities of the user. The concept of Immersiveness exists in 360-format videos to the extent of creating empathy and enjoyment. But in the case of news storytelling where details and cognitive attention matter 360-format videos do not offer cognitive attention to users instead are distractive. The users tend to forget the content of news stories as soon as they are out of the immersive environment.

Conclusion

The results concluded that 360-format news storytelling lessens the attention of participants as they tend to move around to explore the environment. Participants feel it difficult to put attention on one subject and tend to actively move around hence lowering the information retaining ability. Hence, the study termed the loss of attention as a measure of distraction for the users. The visual load acts as an artifact of distraction for the users (de Bruin et al., 2020). To make 360-format a reliable news storytelling format the composition techniques for journalistic videos need to be altered. The participants can be a part of the environment but that does not necessarily require a close one-to-one perspective. The perspective must be a third party so they can develop an understanding of the environment. The videos must be made with graphical navigation to navigate the users back to the subject. The subject's father, Mother, trainer, and the girl's student at the training center are located at poles and hence the user feels the presence of someone and is distracted from the subject. As the environment is near to real there should be some graphical markers pointing towards the subject direction. The navigation factor will create a coordinated head movement and hence users will be able to access similar information and respond accordingly. The polar areas of the video must be made such that it does not contain factors that distract a subject such as in the news story used in this study (DeHart, 2021; Tenic, 2018). However, the study was conducted on news story video and cannot be replicated for other genres of storytelling and other forms of immersive media. The newness of technology might have affected the user's experience. The study has a limited account of the psychological well-being of participants. A detailed cultural and social background analysis can vary the results.

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